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PSYCHOSOCIAL INTERVENTIONS AND DEMENTIA

Understanding, knowing, implementing



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FOREWORD

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It is logical to do everything possible to overcome the difficulties experienced by people living with dementia. What could be more normal than to find solutions to delay the evolution of the disease, and in absolute, to cure it? This expectation sometimes leads to the use of practices that have no health benefits, or that are even dangerous or charlatan. A scientific framework for non-pharmacological interventions (NPIs) has just been proposed in France, enabling practitioners and families alike to sort the wheat from the chaff. This work was coordinated by the international society dedicated to NPIs, the Non-Pharmacological Intervention Society.

Non-pharmacological interventions (NPIs)

Since 2011, the French authorities have been encouraging research into NPIs considering people and contexts of use^[1-2]. The Non-Pharmacological Intervention Society has developed a consensual framework to evaluate NPIs as has been the case for the drugs 60 years ago^[3-4]. This framework, called NPI Model, is currently supported by 3 French health authorities and 28 scientific and medical societies. If these interventions cannot be assessed exactly as drugs given their particularity, it is possible to adopt evidence-based medicine (EBM) and a patient-centred approaches to identify efficient protocols and good implementation practices^[5].

Over the past decade, research has begun to answer questions about the mechanisms, benefits, risks and usefulness of NPIs. It is based on recent discoveries in neuroscience, epigenetics, immunology and exposomics, and digital innovations. These progresses are the result of determined, long-term policies illustrated, for example, by the report of the French National Authority for Health published in 2011 on the

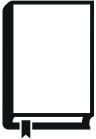


“development of the prescription of validated NPIs”^[1]. A document published in 2011 on the management of “Alzheimer’s disease and related disorders”^[2], the 2018 report of the International Alzheimer’s Association^[4], and the measure 83 of the “French Neurodegenerative Diseases Plan 2014–2019” encourage to assess the effectiveness of NPIs. This development would probably never have taken place without the strong mobilisation of patients’ associations, families, practitioners and scientific societies. The Fondation Médéric Alzheimer has played a key role in this development.

Definition of non-pharmacological interventions

A scientific framework makes it possible to distinguish NPIs from general public health recommendations (e.g., campaigns promoting smoking cessation, alcohol consumption moderation, active mobility), socio-cultural activities (e.g., artistic, social, religious, leisure activities) and alternative medicines (e.g., esoteric therapies). NPIs are evidence-based prevention and care protocols^[3; 5]. The NPIS defines a NPI as “an evidence-based, effective, personalised, non-invasive, referenced health prevention or care protocol supervised by a professional”. A NPI has a psychosocial, physical or nutritional component. It aims to prevent, care or cure a symptom or a disease. An intervention is personalised and integrated into patient’s health/life pathway. It activates several biopsychosocial mechanisms in parallel. It has been the subject of at least one published clinical following the NPI Model. A NPI involves a detailed description of the intervention (name, priority health objective, mechanism of action, duration, material, precautions), the context in which it is implemented and a trained professional. A NPI, to be qualified as such, requires a published interventional/clinical study showing the benefit and identifying the risks.

A NPI targeted to dementia is not a discipline (psychology, physiotherapy, ergonomics, dietetics), an approach (psychotherapy) or a product (pedometer bracelet, yoga posture, ginkgo biloba). The programme combines different techniques that can be proposed and/or prescribed during a specific sequence in the life of people with dementia. A health benefit is thus expected according to the results of the published studies. Naturally, the choice of the intervention is made with the participant and its implementation meets all the conditions of safety, therapeutic alliance, professional ethics, traceability and contextual adjustment. Non-pharmacological interventions are a new arsenal of relevant and safe solutions for the health of people with dementia. The NPI Model was presented to the French Senate on 6 October 2023^[7]. This guide is a further contribution to this development. It presents the main interventions to be provided to people with dementia, such as adapted physical activity, art therapy, animal assisted interventions, dance-based interventions, cognitive rehabilitation, cognitive stimulation therapy, horticultural therapy, multisensory stimulation, music therapy and reminiscence therapy. I acknowledge the authors of the chapters and the visionary approach of the Fondation Médéric Alzheimer.



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NOTICE TO READERS

This guide is intended for all professionals working directly or indirectly with people living with dementia. It aims to improve knowledge and understanding of psychosocial interventions implemented to maintain and/or improve cognitive, psychological, social and physical functioning and, more globally, quality of life of people living with dementia. The relationship and interaction between the person providing the intervention and people living with dementia are central to their support.

Before being provided, these interventions must be thought out, designed and adapted to the needs and difficulties of people living with dementia. It is important to remember that just because these interventions are non-pharmacological does not mean that they are free of effects that can be negative for the person, such as failure, lowered self-esteem or increased behavioural and psychological symptoms. The absence of positive effects during and after an intervention does not necessarily mean that the intervention is not effective but may be due to implementation difficulties. Several questions need to be asked: to whom to propose the intervention? In what context should it be proposed? When is it contraindicated? What is the duration of the intervention? Its frequency? Does the professional providing the intervention have the training or knowledge required for its implementation? Do we have the human and material resources to implement it?

The purpose of this guide is to answer these questions.

The interventions presented in this guide were selected based on scientific evidence of their positive effects. They are also the ones that are most often provided to people living with dementia. Each chapter corresponding to an intervention was written by one or two nationally and internationally experts and reviewed by another expert. Care and support professionals and academics have reviewed the chapters to ensure that they are well understood. Chapters originally written in French have been translated into English.

The interventions presented are intended to be either therapeutic or recreational. Therapeutic intentions refer to targeted objectives in response to a specific situation. The intervention stops when the objective is reached. An evaluation is conducted before, during and after to measure the effects. The intervention is adapted if necessary. Therapeutic intentions include the concepts of support, maintenance, stimulation and rehabilitation. Support, maintenance and stimulation reflect the objective of soliciting, maintaining and strengthening cognitive, psychological, social and physical capabilities. The rehabilitation aims to optimise cognitive, psychological, social and physical functioning in order to reduce the impact of cognitive disorders on daily life. Recreational intention engages people in meaningful activities to strengthen social ties, quality of life and well-being. There is no therapeutic objective. However, the intervention must be proposed within a specific framework. In therapeutic and recreational intentions, benefits can be observed immediately, in the short term and/or in the long term.

In this new version, the original chapters have been updated by their author(s). The summary tables have been revised to take into account of the new elements in the scientific literature since the initial version of the guide published in June 2021.

This new version includes focuses in certain chapters highlighting specific interventions or devices: theatre-mediated interventions, tango therapy, Music Care® and the robot PARO. In addition, a section is devoted to digital devices used by psychosocial interventions to understand the issues involved, their benefits and how they can be used to support people living with dementia.

These psychosocial interventions also aim to improve the well-being and quality of life of family caregivers, as well as the quality of working life of care and support professionals.

For more information on the implementation and evaluation of psychosocial interventions in dementia, see the work of INTERDEM (<https://interdem.org/>), a pan-European network of researchers collaborating in research and dissemination of psychosocial interventions aimed at improving the quality of life of people living with dementia and their supporters.



KEY POINTS

- This guide will be useful to professionals providing psychosocial interventions and to researchers in studies evaluating their effectiveness and efficiency.
- The clinical and practical advice presented in this guide is not a substitute for the training and knowledge required to provide these interventions.
- This advice helps to define the framework for each intervention as well as the human and material resources required.
- An intervention adapted to the needs of people living with dementia will be more effective.
- Dementia training and/or awareness is necessary and recommended.

INTERESTS OF PSYCHOSOCIAL INTERVENTIONS

The summary tables indicate which intervention(s) has/have shown benefits for the symptoms listed. The various effects produced by the interventions were researched in the records and in a pool of scientific publications called “systematic reviews”. After examining all of these publications, an overall score was used to indicate whether or not each intervention produced the effects listed in a convincing manner. Only those effects that were considered to be convincing are highlighted in the table.

The names chosen for the different effects listed in the table and their categories are based on the article of Gonçalves et al., 2018*.

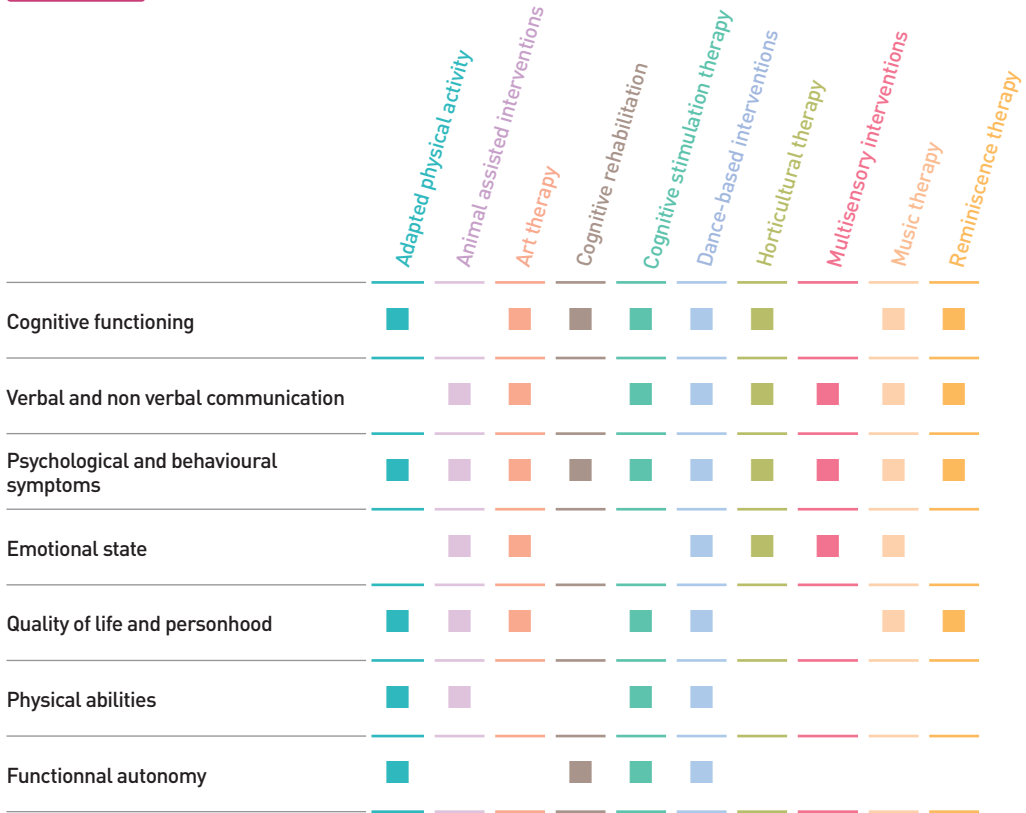
The following table gives a general overview of the benefits of interventions according to the intended effect. The tables on pages 125-127 present specific symptoms grouped by category: cognitive functioning and communication, psychological and behavioural aspects, physical abilities and functional autonomy.

These tables can be used to target interventions according to symptoms, so that the most appropriate intervention can be chosen, taking into account the person’s needs and interests.

The information in the summary tables concerns only people living with dementia. Some of the interventions presented in the guide also have benefits documented in the scientific literature for family caregivers (quality of life, health, well-being and burden, etc.) and for professionals (job satisfaction, well-being at work, stress, etc.).

* Gonçalves, A.-C., Samuel, D., Ramsay, M., Demain, S., & Marques, A. (2020). A Core Outcome Set to Evaluate Physical Activity Interventions for People Living With Dementia. *The Gerontologist*, 60(4), 682-692.

Overview of interventions according to intended effects





PRESENTATION

A. Definition

The World Health Organization defines physical activity (PA) as “any body movement produced by the contraction of skeletal muscles resulting in an increase in energy expenditure over resting expenditure”. For a person weakened by illness, age or disability, the concept of «adapted» physical activity (APA) seems more relevant than simple PA.

In fact, APA is a physical activity adjusted to physical condition and functional abilities. According to the French Ministry of Health decree of 31 December 2016, APA is “the practice, in a context of daily activity, leisure, sport or programmed exercises, of body movements produced by skeletal muscles, based on the aptitudes and motivations of people with specific needs that prevent them from practicing in ordinary conditions”. It is provided for prevention, functional or vocational rehabilitation, education and/or social participation. According to the objectives of the APA, but also to possible disabilities and pathologies, some exercises are specific and train a particular physical domain such as cardio-respiratory capacity, endurance, flexibility, strength or balance, while other exercises are said to be multimodal, i.e., train multiple domains.

Unlike sport, which is often associated with performance and/or competition, APA also pursues strictly preventive and therapeutic objectives in a positive approach to the individual; supporting, maintaining, or developing his or her health and abilities^[1].

B. Fundamentals

According to the collective expertise of the French National Institute for Health and Medical Research (INSERM), which has analysed nearly 2,000 scientific studies on chronic diseases, physical activity, adapted to a patient’s state of health, has benefits on metabolic, joint, muscle, cardiac, neurological and immunological functions^[2].

In dementia, basic scientific studies provide convincing evidence of physical activity effects on brain according to several intertwined physiological mechanisms, notably vascular and related to neuroplasticity benefits^[3-4]. Indeed, this type of pathology has vascular and/or degenerative origins and is particularly favoured by cerebral blood circulation disorders and neuron metabolism, on which physical activity has an action.

Thus, physical activity has a positive vascular effect improving cerebral blood perfusion even though people living with dementia have a decrease in perfusion in certain brain areas. This effect allows a better nutrients consumption and oxygen use by neurons with a better carbohydrate and neurotransmitter



ADAPTED PHYSICAL ACTIVITY

metabolism. This effect protects against neuron function disorders and carbohydrate utilization dysfunctions that promote the formation of amyloid plaques characteristic of Alzheimer's disease. On the other hand, according to animal studies, physical activity would encourage cerebral and vascular plasticity by neural growth factors synthesis, notably BDNF (Brain-Derived Neurotrophic Factor). In addition, human studies have shown an increase or a smaller decrease in size of certain brain areas (including hippocampus, which plays a central role in memory) after the implementation of adapted physical activity programmes.

THEORETICAL BACKGROUND

A. Processes involved

- Physical processes: motor and sensory capabilities, cardio-respiratory abilities, muscular strength, endurance, walking and balance.
- Cognitive processes: memory and body schema, attention and task planning, coordination.
- Behavioural processes: cooperation during group sessions, playing enjoyment, stimulation of action and of autonomy in people who are often sidelined because of their disease or the help they receive.
- Social processes: social interactions, social links and integration of people with each other and with family caregivers and/or care staff and contributors participating in the sessions.

B. Neurophysiological correlates

Physical activity involves different cerebral areas in particular motor (voluntary movements) and somatosensory (visual and motor coordination) areas, cerebellum (balance), but also hippocampus (memory). Moderate or intense physical activity triggers the secretion of beta endorphins and serotonin, well-being hormones. It stimulates bones osteocalcin production, which has a positive neurogenic effect on hippocampus memory neurons.

SCIENTIFIC EVALUATION

Several studies have shown that PA is effective for people living with dementia on mobility, physical functioning, cognition, anxiety, apathy and depression. It would be even more effective associated with cognitive stimulation and speech groups. Further studies are necessary to determine more precisely effective modalities. Meta-analyses of randomised controlled trials are difficult to conduct because participant characteristics, PA programmes, and efficacy criteria are not always comparable. Nevertheless, several meta-analyses have indicated that APA programmes can improve physical and functional abilities^[5-6], cognitive functions^[7], and ability to perform activities of daily living^[6, 8], which are critical for quality of life and autonomy. Another randomised controlled trial showed that burden on family caregivers could be reduced when they supervised people's participation in the programme^[9].

Regarding cost-effectiveness, a research conducted with Siel Bleu by the Health and Ageing Laboratory of the University of Versailles Saint Quentin, the French School of Advanced Studies in Public Health EHESP and the French Institute of Public Policy (Paris School of Economics) evaluated a 12-month adapted physical activity programme with around 450 people in 32 nursing homes in four European countries (Belgium, Spain, France, and Ireland). The results showed that the programme prevented approximately one minor fall per person per year and one accidental fall every 18 months and one serious fall every five years. If this programme were applied on a national scale considering the total number of residents in nursing homes in France, the total net economic benefit per year would be estimated at between 421 million euros and 771 million euros (taking into account the cost of the programme)^[10-11].

An intensive and long-term exercise programme administered to people living with dementia at home could slow the decline in physical functioning without increasing total health and social service costs^[12]. Further, an instructed walking programme for people living with dementia and their family caregivers is potentially cost-effective compared to usual care, when focusing on the reduction of behavioural and psychological symptoms of dementia as outcome of interest. However, no cost-effectiveness threshold was yet defined. The incremental cost-effectiveness ratio for Quality-Adjusted Life-Years (QALY) was high, thus the intervention seems not to be cost-effective with regard to QALY gains. Therefore, further evaluations are needed^[13].

ADAPTED PHYSICAL ACTIVITY

IMPLEMENTATION AND PRACTICAL ADVICE

A. Training and/or knowledge required to provide the intervention

Specialised contributors trained and (if possible, graduate) in APA sciences and techniques. For example, in France, Bachelor of Physical and Sports Activities Sciences and Techniques (STAPS) option APA is recommended. Training and/or awareness in dementia is necessary and recommended.

B. Practical and clinical advice

THERAPEUTIC INTENTION

Participants profile

- People living with mild to severe dementia.
- Family caregivers can participate.

Indications

- Apraxia, memory disorders.
- Mood disorders, apathy, anxiety.
- Behavioural disorders: psychomotor agitation, wandering, opposition to care.
- Sleep/ Wake rhythm disorders.
- Improvement of vital functions and physical performance (cardio-respiratory capacities, reflexes and coordination, balance, muscular power, and weight...).

Contra-indications

- Excessive behavioural disorder (non-verbal aggression, hallucinations).
- No intense physical activity in cases of high blood pressure.

Contributors

- The physical activity programme must be supervised by certified APA professionals.
- Programme suitability must be first evaluated by a physician (general practitioner for example) and/or a psychologist.
- Care staff can contribute to programme implementation: psychologist, psychomotor therapist, physiotherapist, speech therapist, occupational therapist, nurse, nursing assistant.

Setting of intervention

- At home, in fitness room or in institution.
- If indoors: aerated and isolated, windows with curtains, good luminosity.
- Equipment: chairs or armchairs, table, music.
- Gym equipment: balls of different sizes and textures, heels, rings, studs, elastics, markings (different shapes, textures, and colours), adapted rackets, etc.

THERAPEUTIC INTENTION

Dosage

- Period: following regular session respecting the same schedule.
- Frequency: once or twice a week (depending on participants physical condition).
- Duration: 30 minutes to maximum one hour.

Stopping physical activity is accompanied by loss of skills and “deconditioning”, a disadaptation to the activity with deleterious effects on physical and psychosocial health. However, the reverse, positive spiral is always possible.

Session sequencing

- Individual or groups sessions of 3 to 5 people.
- Warm-up routine to start and stretching to end the session.
- Progression cycle.
- Components that can be included are: strength, flexibility, balance, coordination, endurance.
It also helps to work on attention, memory, and relaxation.

Sitting exercises in cases of pathological falls risk to improve physical fitness.

Observance / Attendance

- The APA programme must be adapted to the person, their environment and their lifestyle (home, institution).
- Concentrating and communicating difficulties often reduces motivation, especially since cognitive, psychological and behavioural symptoms limit the expression of needs, feelings, suffering or somatic pain.
- Encouragement and good mood are essential to promote self-esteem.

Assessment

Evaluation at least at programme beginning and at the end (test must be adapted to disease severity and level of autonomy of people):

1. Physical fitness components assessment (tests) by APA intervention provider:

- Agility, dynamic balance: Get Up and Go test, balance test with unipodal support, double task test.
- Muscular strength of upper limbs: arm flexion, pressure of foam balls.
- Muscular strength of the lower limbs: 30 seconds sitting upright, knee flexion.
- Aerobic endurance: 2 minutes on site.
- Flexibility of lower limbs: flexibility while sitting in a chair.
- Flexibility of the upper limbs: to be evaluated with a back scratcher.

2. Psychosocial behaviour assessment by APA provider and by medical and social professionals:

- Observation grids.
- Individual interview whenever possible.

ADAPTED PHYSICAL ACTIVITY

FOR MORE INFORMATION

■ Exercise in the early to middle stage of dementia:
<https://www.alzheimers.org.uk/get-support/daily-living/exercise/early-middle-dementia>

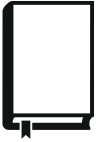
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KEY POINTS

- To improve physical capabilities and mood, stimulate memory, promote sleep and reduce behavioural disorders.
- This intervention involves physical, cognitive, psychological and social processes.
- Observed effects are an improvement in mobility, physical condition, cognitive functions, autonomy, and a decrease in anxiety and depression.
- In group, individually or with a family caregiver.
- For all people living with dementia, regardless of the stage of the disease.



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ANIMAL ASSISTED INTERVENTIONS

**Animal Assisted Activity (AAA) –
Animal Assisted Therapy (AAT) – Animal Assisted Education (AEE)
Animal Assisted Coaching/Counseling (AAC)**

PRESENTATION

A. Definition

Animal Assisted Interventions (AAI) or as lately internationally proposed: Animal Assisted Services (AAS)^[1] are psychosocial interventions by trained human-animal teams, aiming to improve the quality of life of vulnerable populations such as people living with dementia. "Animal Assisted Activity (AAA) is a planned and goal-oriented informal interaction and visitation conducted by the human-animal team for motivational, educational and recreational purposes. Human-animal teams must have received at least introductory training, preparation and assessment to participate in informal visitations. Human-animal teams who provide AAA may also work formally and directly with a healthcare professional, educator, human service provider on specific, documentable goals. In this case they are participating in AAT, AAC or AAE that is conducted by a specialist in his/her profession"^[2].

"Animal Assisted Therapy is a goal-oriented, planned and structured therapeutic intervention directed and/or delivered by health, education, and human service professionals. Intervention progress is measured and included in professional documentation. AAT is delivered and/or directed by a formally trained (with active licensure, degree, or equivalent) professional with expertise in the scope of the professional's practice and a well-trained animal. AAT focuses on enhancing physical, cognitive, behavioural and/or socioemotional functioning of the particular human recipient"^[2].

Animal Assisted Education is a recent area involving teachers, school psychologists or speech therapists trained in animal assisted education. Animal Assisted Coaching/Counselling is a booming sector offering interventions in burn-out, psychological trauma contexts, or in life skills training. In elderly care, it is mostly AAA and AAT that are put into practice.

B. Fundamentals

Animal Assisted Intervention/Service is a fast-growing field with great potential. These interventions/services are innovative, non-invasive, embodied interventions aimed to motivate, activate, distract, elevate mood, relax and increase social interaction in a context of animation or therapeutic indication.

ANIMAL ASSISTED INTERVENTIONS

THEORETICAL BACKGROUND

A. Processes involved

Interventions/services with animals, therapeutic and/or as activity, affect psychological, physical, and social functioning of people living with dementia. AAI/AAS have a positive effect on cognitive functioning such as being alert and 'in the present' as on the mood^[3], on physical functioning such as enhancing the level of activity and improving movement and balance^[4-5], and on social functioning, by stimulating communication and social inclusion^[6]. Since AAI/AAS are experience oriented, embodied and not per se verbal, it can be a good fit for people with cognitive disorders who have trouble understanding verbal communication. AAI/AAS have been found to reduce stress, depressive mood, aggression, and pain and to promote trust, calmness, motivation, and concentration. The physical interaction with the animal activates the oxytocin system, and thus attachment and caregiving behaviour^[7]. The embodied experience in the AAI/AAS (all senses are involved) and the non-judgmental, unambiguous behaviour of the animal create safety, relaxation, joy, distraction, and support^[8]. Theories that are used to explain the working mechanisms of human-animal interactions are all based on relational mechanisms, such as synchrony, attunement, attachment, social support and biophilia. Similar neurobiological/physiological processes take place in the interactions as in interactions between humans.

- Physical processes: fine motor skills, balance, movement coordination, physical and sensorimotor integration (e.g., when walking with the animal, playing, or reaching out to the animal).
- Cognitive processes: attention, concentration, sensory stimulation and processing, attunement and synchronisation with the human-animal team, reminiscence.
- Behavioural processes: expression of emotions, verbal and non-verbal, enhancement of activity level, relaxation, taking initiatives.
- Social processes: social interactions, social inclusion.
- Neurobiological/physiological processes: release of oxytocin, decrease in level stress of hormone cortisol, effect on blood pressure and heartrate.

B. Neurophysiological correlates

There are only a few studies to date on the neurophysiological correlates of AAI/AAS. Odendaal & Meintjes^[9] determined the role of certain neurochemicals during affiliation behaviour on an interspecies basis (human and animal). They found that concentrations of β -endorphin, oxytocin, prolactin, β -phenylethylamine, and dopamine increased in both species after positive interspecies interaction, while that of cortisol decreased in the humans only. Griffioen et al.^[10] found changes in Cortisol and Heart Rate Variability of Children with Down Syndrome and Children with Autism Spectrum Disorder during Dog-Assisted Therapy. Wijker et al.^[11]

found acute stress reduction, reflected in significant reduction in cortisol levels during an AAT session in adults with Autism Spectrum Disorder. To date there seems no research on neurophysiological correlates of AAI/AAS for people living with dementia.

SCIENTIFIC EVALUATION

In the last decades research in AAI/AAS has focused on quality of life of nursing home residents, especially for people living with dementia. A growing number of studies have documented (small) positive effects on outcomes like social interaction, depression and behavioural and psychological symptoms^[12]. In more recent studies, conducted to support the evidence through a scientific approach based on theoretical constructs, positive effects were reported on agitation, depression, quality of life and balance^[3,4; 13-16].

AAI/AAS may be cost-effective in elderly care for several reasons, for example: less agitation of people living with dementia will be beneficial for the atmosphere in the ward and for the workload of care staff (less burnout); a non-pharmacological approach will save the costs of medication and prevent over-medication (delirium); a pleasant activity will distract from minor health problems and thus will save time of staff and reduce medical involvements. However, scientific research into cost-effectiveness of AAI/AAS with people living with dementia in nursing homes has not yet been undertaken.

IMPLEMENTATION AND PRACTICAL ADVICE

A. Training and/or knowledge required to provide the intervention

The human-animal teams need to be qualified and certified: well trained in their profession, have specific knowledge in the field of dementia and trained in the field of the animals involved (ethology, ethics, animal well-being, etc.). AAI/AAS can mean a strong motivational add-on to many therapies in elderly care (physiotherapy, psychotherapy, occupational therapy) and can mean a welcome, relaxing, distractive activity in the daily lives of elderly people in or outside a nursing home.

The field of AAI/AAS in elderly care is multidisciplinary. The teams can range from trained volunteers and professionals with animals doing AAA, to professionals with animals doing AAT (nurses, occupational therapists, physiotherapists, psychologists, medical doctors). The animal species range from dogs and horses to donkeys, cats, hamsters, rabbits, chickens, etc.



ANIMAL ASSISTED INTERVENTIONS

The animals in the AAI teams need to be checked regularly by an animal behaviourist (the behaviour of the animal, the interaction of the animal and the professional and the (emotional) well-being of the animal involved) and a veterinarian (for physical health and zoonoses). The professionals involved also need to be up to date in practice and knowledge and receive appropriate supervision.

When AAI/AAS are provided in health and medico-social establishments, hygiene and safety protocols should be presented and discussed with the hygiene and/or nosocomial infection control committees of the health and medico-social establishments.

B. Practical and clinical advice

ANIMAL ASSISTED THERAPY	ANIMAL ASSISTED ACTIVITY
<p>Participants profile</p> <p>People living with dementia or cognitive disorders who like to interact with animals.</p>	<p>Idem.</p>
<p>Indications</p> <p>Motor rehabilitation: animal assisted exercises with a physiotherapist (fine motor skills, walking, balance) or with a psychomotor therapist (to improve the synchronisation of the movements).</p> <p>Cognitive rehabilitation: animal assisted sessions with a neuropsychologist to improve cognitive functioning (reminiscence, activation).</p> <p>Psychological rehabilitation: animal assisted sessions with a psychologist (to improve mood, decrease loneliness).</p>	<p>For recreation. For relaxation. For activation. For distraction. For playfulness. For reminiscences. For fun. To bring people in present state. To enhance social inclusion.</p>
<p>Contra-indications</p> <p>Allergy. Fear of animals or trauma with animals in past. Aggressive behaviour towards animals in present or past. Severe cognitive disorders or concurrent major psychiatric disorders (e.g., hallucinations).</p>	<p>Idem.</p>

ANIMAL ASSISTED THERAPY	ANIMAL ASSISTED THERAPY
<p>Contributors</p> <p>Therapists as medical doctors, (neuro) psychologists, physiotherapist, psychomotor therapist, nurses, working with or without an animal handler must be trained and certified to work with the animal in AAT. The animal must belong to the therapist or to an organisation and be very familiar to the therapist and must also be specifically trained to be certified as a “mediator”.</p>	<p>Trained and certified AAA teams (human-animal).</p>
<p>Setting of intervention</p> <p>Kind of room depends of the discipline of the therapist that delivers AAT. A safe place to rest for the animal; water needs to be available; hygiene and safety measures and protocols in place; a non-slip floor or ground.</p>	<p>A quiet room; easily accessible for wheelchairs and walker; a non-slippery floor (for the animals); enough space to play and interact with the animal; hygiene and safety measures and protocols in place; safe place for the animal to rest and a water bowl.</p>
<p>Dosage</p> <p>Weekly 1 session, not longer than 45 minutes, until treatment goal is reached.</p>	<p>Weekly 1 or 2 AAA sessions, not longer than 30 to 45 minutes for group sessions; individual sessions same dosage, however 15 to 20 minutes. For group session, no more than 5-8 participants.</p>
<p>Session sequencing</p> <p>Individual sessions or groups of 3 participants.</p>	<p>If possible, twice a week. An AAA session will have more effect twice than once per week. The longer the programme (at least 12 – 16 weeks), the better.</p>
<p>Observance / Attendance</p> <p>The therapist will evaluate each AAT session and follow the treatment plan. If a person does not want to come to a session it needs to be respected.</p>	<p>The AAA providers observe what is happening in their sessions and keep a record of what was happening with whom, to be able to build on the experiences with the participants in the next session. If a participant does not want to visit a session it should be respected.</p>
<p>Assessment</p> <p>The providers of AAT as well as the animals need to be assessed (for adequate training, health, suitability). The participants should be assessed if they like animals, if there is no history of animal trauma or abuse of animals, if they are able to handle animals in a way that is safe for the animal.</p>	<p>Idem.</p>

ANIMAL ASSISTED INTERVENTIONS

FOR MORE INFORMATION

- International Association of Human-Animal Interaction Organizations: <https://iahaio.org/>
- Fondation Adrienne et Pierre Sommer: <https://fondation-apsommer.org/>
- Animal Assisted Therapies – International Association of Animal Assisted Therapy: <https://isaat.org/>
- Animal Assisted Interventions: SCAS (The Society for Companion Animal Studies Code of Practice) for the UK: <http://www.scas.org.uk/wp-content/uploads/2019/08/SCAS-AAI-Code-of-Practice-August-2019.pdf>
- General Standards of Practice: <https://aai-int.org/aai/standards-of-practice/>

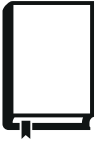
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KEY POINTS

- To stimulate and improve physical, cognitive and psychological capabilities.
- These interventions involve physical, cognitive and social processes.
- Observed effects are an increase in social interaction, an improvement in quality of life, an improvement in balance and a decrease in behavioural and psychological symptoms.
- In group or individually.
- For people living with mild to moderately severe dementia who enjoy animals.



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ART THERAPY

Expressive arts therapy
Creative arts therapy

PRESENTATION

A. Definition

The psychotherapeutic use of art as an intervention is facilitated by an art therapist to help individuals' gain personal insight while engaging in the act of creativity. This process is designed to promote positive well-being through cognitive, emotional, physical, and social assimilation. Art therapy interventions are based on the principle that art is a form of self-expression for all individuals' mental health and wellbeing, despite those with memory and cognitive impairments, such as Alzheimer's disease. Through the facilitation process led by a credentialed art therapist, psychotherapeutic sessions support personal and relational treatment goals. Art therapy is used to foster self-esteem and self-awareness, support cognitive, sensorimotor functions, and cultivate emotional resilience, promote insight, enhance social skills, reduce, and resolve conflicts and distress, and advance societal and ecological change^[1]. Art therapy is practiced with a medical indication, an adapted therapeutic protocol and specific evaluation tools. Thus, the artistic practice used must be defined with regard to the person's and/or his or her family's tastes and in relation to the therapeutic strategy put in place.

B. Fundamentals

Art has been used as a form of expression since the beginning of mankind as seen in cave paintings such as in the Lascaux. Art therapy became a form of therapeutic self-expression in the 1940's when it evolved independently throughout certain parts of Europe and America. The first known individual to refer to art therapy as a mental health treatment was Adrian Hill, an artist from England. While undergoing therapy treatments in a sanatorium for tuberculosis, Hill recommended participating in art projects to his fellow patient peers. He later discussed much of his work as an art therapist in his book *Art Versus Illness*^[2]. Prior to Hill, psychiatrist, Hans Prinzhorn, began to pioneer his work in art and medicine at the Heidelberg Psychiatric Clinic during the 1920's by observing and analysing artwork created by patients diagnosed with schizophrenia. Prinzhorn went on to publish his momentous text, *Bildnerei der Geistekranken* (Artistry of the Mentally Ill) which gave meaningful thought about mental illness and creativity^[3]. Many art therapists' credit Carl Jung, the Swiss psychiatrist and psychoanalyst, as one of the pioneers who helped build the foundation of art therapy. Jung used art as a therapy practice with his clients and engaged in art making himself as a way to resolve inner conflict. He later published *The Red Book*, as a means of illustrating his emotions into images. Since this time, art therapy has vastly grown in multiple disciplines within the mental health and neurology fields. People living with dementia have been of particular interest in using art therapy as a form of treatment. There is a growing body of research demonstrating that art therapy for those with memory impairments are able to create, despite cellular disruption, finding meaning and memories that resurface while in the creative process^[4].

ART THERAPY

THEORETICAL BACKGROUND

A. Processes involved^[5-6]

- Cognitive processes: attention, spatial, sequence and thought process (imagination building and recollection of memory/life stories), and sensory stimulation.
- Emotional/Behavioural processes: self-expression (verbal and non-verbal forms of communication), relaxation, alertness, and self-awareness.
- Physical processes: fine motor skills and sensorimotor integration.
- Social processes: social interactions, social inclusion and social cohesion.

Cultural aspects need be taken into regard in the selection of art mediums and techniques, fine art works exhibited and discussed, and music (if played while creating art). Research studies have found benefit in providing weekly, one-hour sessions, primarily using watercolor as a helpful medium to use with people living with dementia (collage, drawing, sculpture, digital arts and photography are other types of art mediums that can be used), and combined with appropriated music, the act of art making may help deepen the experience in being able to resurface long-term memories and sustain positive mood.

B. Neurophysiological correlates

Studies validate that art making helps to reduce agitation, anxiety, and depression, and stimulate areas in the brain pertaining to long-term memory and spatial recognition. PET (positron emission tomography) brain scan imaging has demonstrated regions in the brain being activated when engaged in forms of creativity. Art making has been compared to a mindfulness meditation in the same form of brain imaging with the releasing of dopamine, serotonin, oxytocin, endorphin (“feel good” chemicals in the brain that help activate neural signalling), thus reducing levels of challenging behaviours.

SCIENTIFIC EVALUATION

Art therapy as a psychosocial and psychotherapy intervention for people living with dementia has been shown to have positive effects on quality of life, social interactions, mood and improved psychological symptoms^[7]. However, the lack of scientific clinical trials in art therapy does not support an evidence-based effect of art therapy, although there is empirical evidence in the academic literature and field observations. Further studies are needed to strengthen the evidence base for the effectiveness of this type of intervention. No large-scale cost studies to date about cost-effectiveness. However, smaller studies conducted in the US and UK indicate a significant reduction in dementia care costs in using art therapy as an effective means to enhance quality of life. Current research in art therapy demonstrates an increase in positive mood and behaviour with depressive, anxiety and agitation symptoms lessened, a reduction in sundowning, reduction in loneliness, decrease usage in psychotropic drugs and a decrease in caregiver stress. Additionally, a larger study funded by The National Endowment of the Arts found a significant support in mental and physical performance on elderly people who engaged in the arts as a means for healthy ageing^[8].

IMPLEMENTATION AND PRACTICAL ADVICE

A. Training and/or knowledge required to provide the intervention

Degree of art therapist or any health professional who has undergone specific training in the practice and teaching of art. Training in and/or awareness in dementia is necessary and recommended.

ART THERAPY

B. Practical and clinical advice

THERAPEUTIC INTENTION

Participants profile

- People living with mild to moderate dementia.
- Family member e.g., spouse, adult child, grandchild and/or other caregiver may also participate along with the person living with dementia as a way to strengthen relationship bonds. It is recommended artwork be created together and not having the caregiver take over the person living with dementia's work.

Indications

- Cognitive support: memory and executive functioning.
- Psychology support: mood, behaviour, social cohesion, and quality of life.
- Neurological support: limiting psychotropic drug usage in neural activity.

Contra-indications

- In some cases, severe cognitive disorder and/or late end stage dementia where creating art may not be possible
- Sensory and/or physical limitations.
- Severe chronic pain.
- Severe behavioural disturbances.
- Concurrent major psychiatric disorders with negative hallucinations and other continuous negative preoccupations.

Contributors

A college degree and/or registered art therapist, undergraduate or graduate student in an art therapy programme, therapist or registered instructor in the arts, activity director; additional staff to facilitate the session with proper training in art therapy. Art therapy must be practiced by a trained professional. If a caregiver uses art for the purpose of care, it is not necessarily art therapy.

Setting of intervention

- A quiet space away from noise and other distractions, preferably with windows for fresh light and if possible, with a view of nature.
- A room with close proximity to a sink.
- A room with tables and chairs with enough space to maneuver in between.

THERAPEUTIC INTENTION

Dosage

- Period: sessions are conducted on an on-going bases.
- Frequency: at least once a week.
- Duration: usually mid-morning is the more optimal time to hold sessions and lasting anywhere from 45 minutes to an hour (depending on attention span, some may only hold attention for 20 to 30 minutes).

It is recommended to provide sessions on the same day(s) each week and at the same time(s) for consistency. Using adult, dignifying materials and avoiding child-like art supplies.

Session sequencing

- Art groups can be held in 1:1 independent or in group sessions, ideally between 5-8 participants per 1-2 facilitators (groups no more than 10-15 participants should have three facilitators. Anything over 15 participants is not recommended and needs to be well staffed).
- Presentation: reviewing an artist from a fine art book and giving some information of the artist's life history, showing two to three images of their artwork, and engaging in a discussion can help "set the stage" in getting creative. The theme of the art group can be based from the featured artist, e.g., Picasso and painting in cubism; O'Keefe and painting a flower up-close. If it is chosen to not feature an artist, a selected directive can be demonstrated e.g., painting a favorite landscape using watercolor, creating a favorite kind of day magazine collage *a vital component to the artwork is processing it, e.g., what is the title of the art created, what comes to mind when looking at it. (*paintbrushes should be placed lying flat to dry).
- Processing: writing the memory/story of what the person said on the back of their art or on a notepad to go with the art as a way to capture what the person is thinking and feeling. Sharing art with family members is additionally recommended to have meaningful conversations.
- Storage: artwork can be stored in each participate folder or given to them/family member and art supplies should be cleaned, dried, and stored away in a safe place.

Observance / Attendance

- Participants reluctant to attend sessions should be encouraged to attend, and continued to be invited, a call for re-evaluation of appropriateness of intervention may be needed.
- Engage various individuals to attend, even those who seem shy or avoidant of art.
- Keep sessions consistent to the same individuals for consistency and include others as needed.
- Ensure hearing aids are in place, eye glasses are clean and clothes are appropriately on e.g., shoes are on the correct foot.

Assessment

Cognitive and behavioural

ART THERAPY

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KEY POINTS

- To stimulate cognitive functioning, improve mood and quality of life, stimulate social interactions and manage behavioural symptoms.
- This intervention involves cognitive, emotional, physical and social processes.
- Observed effects are an improvement in quality of life, well-being and social interactions, a decrease in agitation, depression, anxiety and feelings of loneliness, and a decrease in the use of psychotropic treatments.
- In group, individually or with a family caregiver.
- For people living with mild to moderate dementia.



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FOCUS ON THEATRE-MEDIATED INTERVENTIONS

PRESENTATION

Theater is a form of self-expression with health benefits. Theatrical mediations are particularly well-suited to people living with dementia to provide them with cognitive, psychological and social support. Different approaches exist: the rehabilitation of cognitive disorders by learning theatrical acting techniques, and the drama therapy, which promotes a therapeutic process through the intentional use of dramatic techniques. These different approaches all have in common to promote well-being and to have an impact on behaviour and mood.

THEORETICAL BACKGROUND

Theater mobilises cognitive (attention, spatial orientation, memory), emotional (memories and personal experiences), psychological (well-being, expression, awareness and self-improvement), behavioural (verbal and non-verbal communication, relaxation,) physical (fine motor skills and sensory-motor

integration) and social processes (social interaction, group cohesion). Taking part in theatre involves the body, the range of the voice, gestures, movements and stage presence. It improves the ability to improvise and adapt both on stage and in everyday life.

In a cognitive rehabilitation context, the aim is to increase cognitive and cerebral reserves and activate new compensatory neural networks in the early stages of the disease.

Dramatherapy is based on specific approaches, such as Jacob Moreno's psychodrama, Augusto Boal's theatre-forum and different therapeutic mediations (Anne Brun, René Rousillon, Patricia Attigui, etc.).

SCIENTIFIC EVALUATION

Some studies have highlighted an improvement in mood and quality of life^[1-2], attention^[2] and a reduction in social isolation^[1]. A randomised controlled trial^[2] found benefits in favour of the experimental group (drama therapy versus usual activities) after 8 weeks of intervention, with maintenance of results after 12 weeks of intervention. A recent study developed an intervention programme with professional theatre directors providing theatre workshops followed by public performances^[3-4]. The aim was to teach theatrical acting techniques to people with and without cognitive impairment. The results showed an improvement in the participants' episodic memory, working memory, executive functions, attention, mood, apathy and self-esteem. A pilot study observed that after 16 weeks of intervention, people living with dementia were able to express their emotions in an appropriate and unambiguous way^[5].

IMPLEMENTATION AND PRACTICAL ADVICE

Sessions focus on relaxation exercises, warm-ups, diction, physical and scenic expression and improvisation. The work is adapted from the techniques of acting and memorisation that a professional actor uses, associating text and movement, gesture, gait and action. A range of media and artistic techniques can be used (mime, writing, reading, puppets, masks, costumes, music, etc.). Dramatherapy sessions are supervised by a dramatherapist, an artist mediator or a therapist and follow artistic and/or therapeutic objectives. Sessions are weekly, monthly or twice monthly, lasting between one and one-and-a-half hours, in groups of between 5 and 12 participants. In a cognitive rehabilitation way, the programme of theatre workshop consists of 16 weekly one-and-a-half-hour sessions in groups of up to 12 participants. The sessions are supervised by a theatre teacher or director.



For all approaches, sessions can include people with no cognitive impairment and family caregivers, provided there is a good relationship between family caregiver and people living with dementia. This fosters a group dynamic that contributes to giving back confidence to people living with dementia. Older people with no cognitive problems learn a lot about themselves during these experiments, about their fear of ageing, of illness, of dementia,... The sessions can result in public performances that encourage people to change the way they look at people living with dementia, who are more than capable of performing on stage and enjoy doing so.

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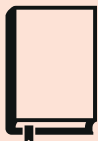
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KEY POINTS

- To stimulate and improve cognitive, psychological and motor skills.
- These interventions mobilise cognitive, psychological, social and physical processes and provide opportunities for individual and group expression.
- Observed effects are an improvement in episodic memory, working memory, executive functions, attention, social interaction, quality of life, self-esteem and a reduction in psychological and behavioural symptoms (apathy, depression, anxiety).
- In groups.
- For people living with dementia, at all stages of the disease.



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COGNITIVE REHABILITATION

Neuropsychological rehabilitation (clinical settings)

Reablement or restorative care (community settings)

Tertiary prevention (public health)

PRESENTATION

A. Definition

Cognitive rehabilitation for people living with dementia is a behavioural therapy for managing the impact of cognitive impairment on everyday life^[1]. It does not aim to cure dementia but to enable the optimal level of functioning despite the condition. The focus is on achieving personal goals relating to activities of daily living and social engagement; the ultimate goal is to improve quality of life and well-being. Cognitive rehabilitation is built on goal setting and problem-solving approaches. It can be seen as a toolbox of compensatory aids and enhanced learning techniques to facilitate new learning, reduce impairment, and build upon strategies to facilitate the process that can all be combined into a personalised intervention^[2].

B. Fundamentals

Cognitive rehabilitation was originally developed as an intervention to remediate cognitive impairment following brain injury. It started as a set of mechanistic exercises engaging cognitive abilities (i.e., brain training) and evolved into an individualised, collaborative, and holistic programme focused on regaining competence in everyday situations. In brain injury settings, it promotes alleviation of the underlying impairment while offering practical ways to bypass associated difficulties such as changes in mood, motivation or communication, and relationship problems^[3]. While it is not possible to improve the underlying impairment in dementia, the approach is relevant for mitigating the impact of cognitive difficulties on everyday life and it serves as a valuable framework for conceptualising dementia care^[4].

THEORETICAL BACKGROUND

A. Processes involved

A course of cognitive rehabilitation can be divided into four stages^[1]:

- 1 The first step is to gain a thorough understanding of the person's current level of functioning within a broader family and social context, and in relations to past experiences, assets and expectations. This is a crucial time for establishing trust and setting a tone for the collaborative work ahead.
- 2 The second step involves identifying the person's key areas of dissatisfaction and subjective priorities for improving the current situation, and then refining them into clear therapy objectives (goals) using SMART principles (Specific, Measurable, Attainable, Relevant, Time-limited). As part of this collaborative process, the practitioner assesses the demands of the tasks, the person's cognitive ability and noncognitive barriers and available resources, ensuring the eventually agreed therapy goal is potentially achievable as well as relevant and inspiring for the individual living with dementia.



COGNITIVE REHABILITATION

- 3 Finally, the individual therapy plan is developed in order to bridge the gap between the person's current ability and the demands of the goal-related activities.
- 4 Progress with therapy is closely monitored and the plan is adjusted, if needed, to ensure ongoing engagement and desired therapy outcomes. Simple Likert-style ratings are often used to quantify the change^[5].

B. Neurophysiological correlates

While memory encoding and consolidation are impaired from the outset of the most common types of amnesic dementias (Alzheimer's disease, vascular dementia) the progression is gradual and other cognitive functions are relatively preserved in the earlier stages (language, visuospatial abilities, and implicit memory). That remaining cognitive ability provides a sufficient basis for new learning and therapeutic work in mild and moderate dementia^[6].

SCIENTIFIC EVALUATION

There is growing evidence for the effectiveness of cognitive rehabilitation programmes and specific rehabilitative techniques that range from small-scale pre- and post-comparison studies to large randomised controlled trials, with studies reporting reduced functional disability and better performance in daily tasks^[7-13]. While the studies focus on Alzheimer's disease, there is some early work in non-amnesic forms of dementia^[14-15].

There is limited research on the cost-effectiveness of cognitive rehabilitation in dementia. In the GREAT multicentre single-blind randomised controlled trial (Goal-oriented cognitive Rehabilitation in Early-stage Alzheimer' and related dementias), the intervention was reported as cost-effective from both health and social care and societal perspectives at willingness-to-pay values of £2,500 and above, in terms of achieving improvement in relation to areas specifically targeted in the therapy, but not in terms of gains in the quality-adjusted life-years of the person living with dementia or the care partner^[16].

IMPLEMENTATION AND PRACTICAL ADVICE

A. Training and/or knowledge required to provide the intervention

Practitioners need to know the principles of cognitive rehabilitation and specific rehabilitative techniques, and have experience in goal-setting, solution-based problem-solving approach, and activity analysis. It is also essential to understand the biopsychosocial model of dementia and the specific needs of people

living with dementia. Clinical psychology, neuropsychology and occupational therapy courses typically include modules on dementia and cognitive rehabilitation for acquired brain injury and therefore provide excellent knowledge and skill base for providing cognitive rehabilitation for people living with dementia.

B. Practical and clinical advice

THERAPEUTIC INTENTION

Participants profile

People living with early-stage dementia, particularly the amnesic type.

Indications

Difficulties in managing everyday activities.

- Cognitive rehabilitation: any cognitive difficulties that affect daily life (memory, language, planning and sequencing, executive functions, motor praxis).
- Psychological rehabilitation: anxiety, low esteem, poor sleep when secondary to cognitive difficulties.

Contra-indications

Limited understanding of own level of functioning, reluctance to confront the difficulties and put effort into addressing them.

Contributors

Practitioners trained in cognitive rehabilitation (clinical psychologist, neuropsychologist, occupational therapist, specialist nurse); person living with dementia as an active participant and contributor along with the care partner if possible.

Setting of intervention

Place of residence (home, care home).

Dosage

Individual sessions depending on the needs and circumstances.

- Period: 4-12 weeks.
- Frequency: weekly or biweekly.
- Duration: 40-60 minutes session.

Session sequencing

After the initial assessment and goal-setting session, the following sessions typically start with reviewing therapy goals and strategies, then focus on progressing that work or on addressing potential barriers (e.g., anxiety), and end with planning for the between-session practice if needed.



COGNITIVE REHABILITATION

THERAPEUTIC INTENTION

Observance / Attendance

It is helpful when a caregiver (close friend, family member) is involved.

Assessment

Interview; activities of daily living; neuropsychological evaluation of cognitive functions relevant for the individual therapy goals.

FOR MORE INFORMATION

- A short introduction to cognitive rehabilitation in dementia: Kudlicka, A., & Clare, L. (2018). Cognitive rehabilitation in mild and moderate dementia. In *Oxford Research Encyclopedia of Psychology*.
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ABOUT THE AUTHOR

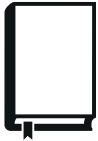
Aleksandra Kudlicka, PhD, is a psychologist and researcher at the University of Exeter involved in work on introducing cognitive rehabilitation into dementia health and social care services.



KEY POINTS

- Cognitive rehabilitation involves managing memory and executive difficulties that affect daily life and addressing the psychological impact of these difficulties.
- The intervention addresses cognitive, psychological and social processes.
- Observed effects are that people living with mild or moderate dementia can make improvements in functioning in relation to their personal goals targeted in the intervention.
- A therapist can work directly with the individual or with the involvement of a family caregiver.
- Research so far focused on people living with early-stage cognitive impairment where memory impairment is predominant (Alzheimer's disease and vascular disease).

COGNITIVE REHABILITATION



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COGNITIVE STIMULATION THERAPY

Cognitive stimulation

PRESENTATION

A. Definition

Cognitive Stimulation Therapy (CST) is a psychosocial intervention for people living with dementia that aims to improve cognitive function through themed group activities, which implicitly stimulate skills including memory, executive function, and language through tasks such as categorisation, word association and discussion of current affairs. It also intends to improve overall quality of life and mood. Sessions follow a set of guiding principles which include “new ideas, thoughts and associations”, “maximising potential” and “opinions rather than facts”^[1].

B. Fundamentals

Cognitive Stimulation Therapy was designed through systematically reviewing the literature on the main psychosocial interventions for dementia^[2] and combining the most effective elements of these therapies. The programme is built upon several theories including learning theory and brain plasticity, which suggest that appropriate and targeted mental stimulation, for example through building new semantic connections, can lead to the development of new neuronal pathways. Social theories suggest that creating an optimal and supportive group environment can enhance skills, reduce stigma and increase well-being and there is evidence that improved cognition in CST is mediated by improved quality of life^[3-4].

THEORETICAL BACKGROUND

A. Processes involved

- Physical processes: sensorimotor integration.
- Cognitive processes: memory, executive functioning, language production and comprehension, spatial and temporal orientation, praxis.
- Behavioural processes: mood, behavioural and neuropsychiatric symptoms.
- Social processes: social interaction, social communication.

Based on the involved processes mentioned above, it is important to highlight that CST also aims to improve quality of life and well-being of people living with dementia and their caregivers. It is the only psychosocial intervention recommended to treat cognition by the United Kingdom (UK) National Institute for Health and Care Excellence (NICE) guidelines, being now offered by over 85% of UK memory services. It is endorsed by Alzheimer’s Disease International, used in over 38 countries globally and translated into at least 10 languages.

COGNITIVE STIMULATION THERAPY

B. Neurophysiological correlates

Cognitive Stimulation Therapy is a psychosocial intervention that aims to mentally stimulate people through complex psychological techniques (implicit learning, multi-sensory stimulation) embedded in structured group activities (word association, current affairs). The sessions create a positive but challenging learning environment which could stimulate the functioning of existing neural networks and also promote the functioning of alternative neuronal pathways. It might also stimulate the frontal lobe, as has been shown in studies exploring neural correlates of psychosocial intervention for people living with dementia^[5-6]. However, to date, there is no published study exploring specifically the neurophysiological correlates of CST.

SCIENTIFIC EVALUATION

Group-based CST is recommended to be evidence-based intervention for dementia in the literature. A recent systematic review^[7] included 12 studies (8 RCTs) from the United States (US), UK, Hong Kong, Japan, Tanzania, and Portugal and found that all studies examined impact on cognition, with nine demonstrating statistically significant improvements. Several studies also found significant benefits to quality of life, depression, and impact on caregivers. Crucially, the review concluded that the CST programme can be widely linguistically and culturally adapted, with the benefits to cognition replicated internationally. A synthesis of 22 systematic reviews incorporating 197 unique studies of psychosocial interventions in dementia^[8] concluded that cognitive stimulation demonstrates the best evidence for improving cognition amongst all psychosocial interventions.

Economic analyses have shown that CST is more cost-effective than usual care when looking at benefits in cognition and quality of life^[9]. Also, the UK National Health System (NHS) conducted an economic evaluation of the alternatives to antipsychotic drugs for people living with dementia, showing that, combining health care cost savings and quality of life improvements, CST used routinely could save £54.9 million annually for the NHS^[10].

IMPLEMENTATION AND PRACTICAL ADVICE

A. Training and/or knowledge required to provide the intervention

Cognitive Stimulation Therapy can be administered by anyone working with people living with dementia, such as care staff, psychologists, occupational therapists, or nurses. Practitioners can learn to provide CST treatment for people with dementia by following the CST manual or attending CST training. Training and/or awareness in dementia is necessary and recommended.

B. Practical and clinical advice

THERAPEUTIC INTENTION

Participants profile

People living with mild to moderate dementia.

Indications

- Cognitive stimulation: memory, executive function and language.
- Psychological stimulation: mood, social interaction and quality of life.

Contra-indications

Severe cognitive disorders, severe auditory and/or vision loss, behaviour incongruent with group session.

Contributors

Care workers, psychologists, occupational therapists or nurses working with people living with dementia.

Recommendation: Two facilitators per group

Setting of intervention

Isolated and quiet room including comfortable chairs, a table, a whiteboard, a ball and a music player.

Note that virtual delivery is also feasible and recommended to be offered to patients unable to access traditional in-person CST for health reasons, lack of transport or COVID-19 restrictions^[11].

Dosage

Group sessions with 5 to 8 participants.

- Period: 7 weeks.
- Frequency: twice a week.
- Duration: 45 minutes - 1 hour session.

Session sequencing

1 Welcome members individually; **2** Group name and song; **3** Temporal orientation; **4** Discussion about current affairs; **5** Main activity; **6**. Closure.

Observance / Attendance

To reduce reluctance to participate, group members should ideally be at similar stages of dementia and the sessions activities should be proposed according to group members' interests.

Assessment

Cognitive, functional, behavioural, mood, quality of life.

COGNITIVE STIMULATION THERAPY

FOR MORE INFORMATION

International Cognitive Stimulation Therapy (CST) Centre:
<https://www.ucl.ac.uk/international-cognitive-stimulation-therapy/>

ABOUT THE AUTHORS

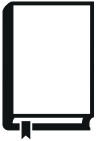
Élodie Bertrand, PhD, is a neuropsychologist and an associate professor at the University of Paris, working in the Memory, Brain & Cognition Laboratory.

Aimee Spector is Professor of old Age Psychology at University College London and director of the International Cognitive Stimulation Therapy (CST) centre.



KEY POINTS

- To stimulate cognitive functioning (memory, language, attention-concentration, executive functioning) and provide psychological support.
- This intervention involves physical, cognitive, behavioural and social processes.
- Observed effects are a maintenance or an improvement of the cognitive functioning and an improvement of mood and quality of life of family caregivers.
- In group sessions.
- For people living with mild to moderate dementia.



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DANCE-BASED INTERVENTIONS

Dance therapy – Dance movement therapy

Psychomotor dance therapy

Dance movement psychotherapy

PRESENTATION

A. Definition

According to the Association of Dance Movement Psychotherapy (ADMP), the psychotherapeutic use of movement and dance engage people in creative processes intended to promote emotional, cognitive, physical and social integration, and spiritual aspects of self. This intervention is based on the assumption that movement is a form of expression of a person's thoughts and feelings. By identifying, recognising and accompanying people's movements, therapists encourage the development and integration of new adaptive movement patterns in relation to emotional experiences of people^[1]. Some dance-based interventions refer to this definition.

B. Fundamentals

Dance therapy is part of the four major disciplines of art therapy (visual arts, music therapy, drama therapy and poetry therapy). Dance therapy appeared as a care intervention in 1942 in the USA^[2]. Dance is a multimodal activity involving motor, sensory and sensorimotor skills, and cognitive, emotional and social abilities^[3]. A growing body of research shows that creative arts and physical exercise can reduce disability, improve social interaction and slow down progression of dementia^[4].

THEORETICAL BACKGROUND

A. Processes involved^[1;5]

- Physical processes: motor skills, balance, gait, movement coordination, physical and sensorimotor integration.
- Cognitive processes: attention, spatial movement planning, synchronisation in space and time, learning motor skills or sequences, sensory stimulation, creativity.
- Psychological, symbolic and metaphoric processes: body-image, self-expression (verbal and non-verbal communication), self-awareness, creativity, meditation, relaxation, expression of conscious and unconscious emotions, access to unconscious and/or difficult feelings.
- Social processes: social interactions, social inclusion.

Cultural aspects must be considered for the choice of dance and music styles. Processes listed above are more or less triggered in response to the quality of relationships initiated between the therapist and participants.

DANCE-BASED INTERVENTIONS

B. Neurophysiological correlates

Many of the brain areas activated by dance are also activated by sensorimotor activities^[6]. Studies show that dance helps to reduce psychological stress, increase levels of serotonin (a wellness hormone), and develop new neural connections, especially in areas involved in executive functions, long-term memory, and spatial recognition^[7]. Functional imaging has been used to isolate areas of the brain that contribute to the learning and performance of dance: motor cortex (planning, control, and execution of voluntary movements), somatosensory cortex (motor control and visuo-motor coordination), basal ganglia (movement coordination) and cerebellum (integration and planning of motor actions)^[7]. Dance stimulates interhemispheric exchanges^[8], thus encouraging information processing. Learning dance is associated with long-term plasticity in older adults^[9-10]. Dance as a rehabilitative activity can foster cerebral plasticity of older people^[11].

SCIENTIFIC EVALUATION

Dance as a psychosocial intervention for people living with dementia has shown positive effects on balance, gait, risk of falling, physical activity, cognition, quality of life, social interactions, and behavioural and psychological symptoms^[12-13]. Further studies are needed to increase the level of evidence for the effectiveness of this type of intervention, even though there is empirical evidence in the scientific literature (e.g. case studies) and observations in the field^[13]. There is a lack of evidence on the cost-effectiveness of dance interventions to prevent falls^[14].

IMPLEMENTATION AND PRACTICAL ADVICE

A. Training and/or knowledge required to provide the intervention

Dance therapist or dance movement therapist or dance movement psychotherapist who has undergone a specific Masters level training programme (2/3years).

Basics in psychomotricity and/or occupational therapy, as well as knowledge of neurodegenerative disorders. Knowledge of and clinical skills in the practice of Person Centred Care^[15].

B. Practical and clinical advice

THERAPEUTIC INTENTION	RECREATIONAL INTENTION
<p>Participants profile</p> <p>People living with dementia or cognitive disorders.</p>	<p>Open to anyone.</p>
<p>Indications</p> <ul style="list-style-type: none"> ■ Motor rehabilitation: walk, functional mobility, balance, risks of fall. ■ Cognitive rehabilitation: memory, executive functions, motor praxis. ■ Psychological rehabilitation: social interaction, mood, quality of life, social withdrawal, anxiety, depression, agitation. <p><i>Dance, as a physical activity, is beneficial for most people, including those who are frail or have reduced physical capacity, including in terms of prevention</i></p>	<p>Convivial events, community dance, regular recreational activity, social events.</p> <p><i>Dance, as a physical activity, is beneficial for most people, including those who are frail or have reduced physical capacity, including in terms of prevention.</i></p>
<p>Contra-indications</p> <p>Medical contra-indications</p>	<p>Idem.</p>
<p>Contributors</p> <p>Dance movement therapist, dance movement psychotherapist and additional care staff to assist the therapist.</p>	<p>Staff, families, friends.</p>



DANCE-BASED INTERVENTIONS

THERAPEUTIC INTENTION	RECREATIONAL INTENTION
<p>Setting of intervention</p> <p>Quiet, relaxing, well-ventilated, and spacious room. Non-slip floor or ground. Refreshments and chairs at disposal.</p>	<p>Ballroom, community centre, day centre. Non-slip floor or ground. Refreshments and chairs at disposal.</p>
<p>Dosage</p> <p>Individual or group sessions of 8 to 10 participants.</p> <ul style="list-style-type: none"> ■ Period: 12 weeks. ■ Frequency: at least twice a week. ■ Duration: 30-60 minutes session (average 40 minutes). 	<p>Not specified.</p>
<p>Session sequencing</p> <p>1 Welcome; 2 Warm-up; 3 Development with exercises and free dancing; 4 Closure; 5 Cool down; 6 Participants feedbacks. The movement can remain free with no obligation of coordination. Supports can be used (balloons, scarves, feathers, bells...)</p>	<p>Not specified. The movement can remain free with no obligation of coordination. Supports can be used (balloons, scarves, feathers, bells...).</p>
<p>Observance / Attendance</p> <p>Check that the sessions are appropriate and allow each participant to dance safely.</p>	<p>Not specified.</p>
<p>Assessment</p> <p>Cognitive, psychomotor, quality and speed of walking, balance, behavioural, quality of life, Laban Movement Analysis (LMA) or Kestenberg Movement Profile (KMP).</p>	<p>Quality of life, well-being, satisfaction.</p>

FOR MORE INFORMATION

- Association for Dance Movement Psychotherapy UK: www.admp.org.uk

ABOUT THE AUTHORS

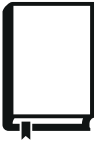
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KEY POINTS

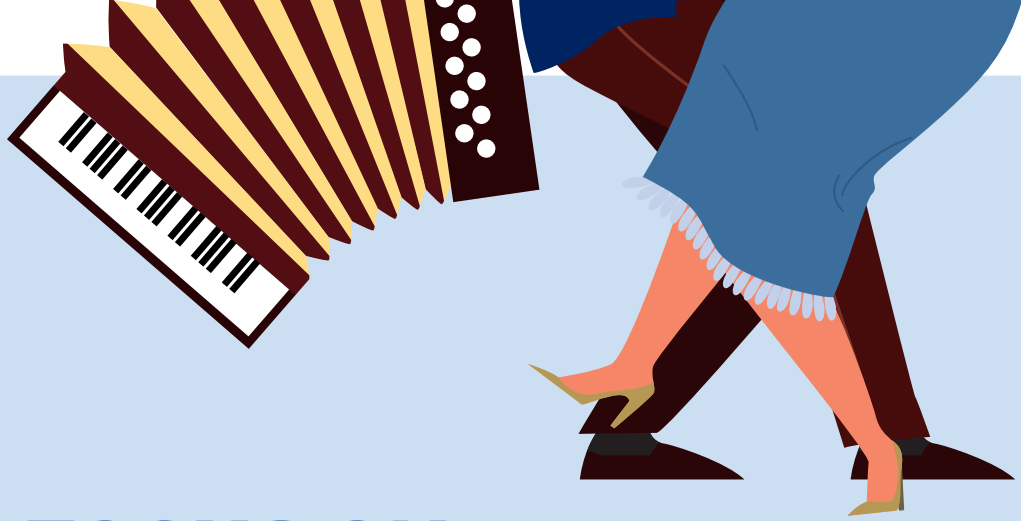
- To provide a physical, cognitive or psychological rehabilitation.
- Dance interventions involve physical, cognitive, psychological and social processes.
- Observed effects are improvements in balance, gait, functional mobility, cognition, quality of life and social interactions, and a reduction of behavioural and psychological symptoms and in the risk of falls.
- In group, individually or with family caregivers and/or friends.
- For all people living with dementia who are physically able to dance or participate sitting down.

DANCE-BASED INTERVENTIONS



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FOCUS ON TANGO THERAPY

PRESENTATION

Tango therapy is a non-pharmacological intervention based on the principles of dance therapy and rehabilitation for older people. Its aim is to promote bio-psycho-social health, relying on the remaining capabilities of each individual. By integrating music, artistic elements of dance, and specific movements inherent in tango, this therapy creates an enriching environment, stimulating the expression of emotions, social interactions, and mechanisms of perception-action. By relying on implicit communication, tango therapy provides an ideal therapeutic space for people living with dementia.

THEORETICAL BACKGROUND

Music activates various areas of the brain, notably the motor and premotor cortex, engaging individuals in movement and dance. This activity embodies the advantages of moderate physical activity and continuously stimulates motor cognition, meaning the interaction of the body with its environment. These activities are capable of inducing changes in the structure and function of the brain, promoting neuroplasticity, and enhancing cognitive and functional capacities.

Tango is particularly well-received among older people due to its cultural and emotional resonance. Additionally, the biomechanical attributes of tango steps have been proposed as a basis for a method of rehabilitating gait and functional mobility, involving the mobilisation of everything we aim to activate through traditional rehabilitation.

SCIENTIFIC EVALUATION

Numerous studies have highlighted the beneficial effects of tango on motor skills, cognition, mood, and quality of life^[1-2]. Among older people, a notable improvement has been observed in the areas of gait, functional mobility, and motor cognition^[3]. Recently, a multicenter study demonstrated a significant improvement in the quality of life of residents in nursing care facilities following a three-month tango programme^[4]. Furthermore, a randomised controlled study showed significant effects on gait speed in individuals living with major neurocognitive impairment in institutional settings^[5]. However, further investigations are still necessary to establish a clear link and, more importantly, to better understand the underlying mechanisms behind these effects.

IMPLEMENTATION AND PRACTICAL ADVICE

Tango therapy sessions are primarily supervised by dance therapists trained in this discipline and in the support of older people. Healthcare professionals can also lead these sessions after completing specific training. In France, the University of Burgundy offers a 4-day training programme designed to provide the necessary skills for conducting therapeutic tango workshops.

The frequency of the sessions should be adjusted based on the participants' condition. A minimum of two sessions per week lasting between 45 and 90 minutes are necessary to observe significant effects in terms of motor improvement. The recommended duration is three months, extendable according to the participants' preferences. A suitable room for the group, one chair per participant, and appropriate footwear are essential.

FOR MORE INFORMATION

- Training in Therapeutic Tango. University of Burgundy
- The Caravan of Memory: <https://youtu.be/DXhiJj6drxl?si=EMcgJZzErX-2FXm->
- Online tango for seniors: https://youtu.be/XJA2f89MneU?si=g5JARiwwEUWw_sSZ

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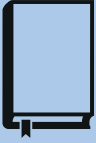
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KEY POINTS

- To maintain and improve functional abilities, gait, and balance.
- To experience the emotion and pleasure of engaging in a meaningful activity.
- To reactivate social connections.
- In residential care homes, day care centres, communities, or at home.
- At all stages of the disease, focusing on the remaining capabilities of the individual



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HORTICULTURAL THERAPY

Therapeutic garden – garden therapy
Therapeutic horticulture
Nature-based therapy – Healing Garden^[1]

PRESENTATION

A. Definition

A holistic therapeutic act that involves garden using, gardening, plants growing or more generally relationship to plants and materials derived from nature in order to improve physical, mental, and social health^[2]. This therapy is particularly suitable for elderly people and people living with dementia^[3-4].

B. Fundamentals

The general fundamentals refer to evolutionary theories of biophilia and the genetically embedded processes of adaptation to the environment^[5]. Biologically, physiologically, and spiritually, human beings are made to interact with natural environment in the sense of life. Relationship to nature provides stimulation of vital momentum, body mobilisation, positive emotions, decreased stress levels, recovery of attention and concentration abilities and stimulation of cognition. It supports imagination and creativity. It strengthens self-esteem, sociability and contributes to the development of the inner history of life by positioning and balancing being in its fundamental relationships with the world. These instinctive mechanisms are relatively independent of intellectual capacity and cultural background. They remain preserved and available for a long time regardless of the pathologies^[6].

THEORETICAL BACKGROUND

A. Processes involved

- Physical processes: musculoskeletal maintenance: tone, trophicity, muscle strength, joint flexibility, motor coordination, fine motor skills, respiratory capacity. Cardiovascular maintenance: heart rate, blood pressure, arterial and venous network, skin trophicity. Sensory maintenance: vision, hearing, smell, taste, hearing, touch, proprioception, balance, temporal and spatial orientation. Exposure to natural light: regulation of biological rhythms, sleep/wake, appetite regulation, vitamin D therapy, mood regulation, strengthening of natural immunity.
- Cognitive processes: reminiscences and memory training: episodic memory, semantic memory, procedural memory, and cultural memory. Emotions stimulating, wording, storytelling. Imagination and metaphor. Psychomotor programming.
- Psychological and behavioural processes: body autonomy, adaptation to situations, self-esteem, expression of emotions, communication.
- Social processes: openness, listening, trust, willingness to exchange, social interactions, tolerance, quality of life and dignity.

HORTICULTURAL THERAPY

B. Neurophysiological correlates

A variety of natural sensory stimulations promotes brain arousal and adaptation of muscle tone from the brain stem. The stimulation of memory and emotions centers induces an impression of familiarity and adaptability to this environment. This condition requires cognitive abilities and behavioural regulation. Regulation of stress levels lowers cortisol levels. Inhibition of the sympathetic system reduces the catecholamines rate (action on the cardiovascular system). Action on serotonin pathways reinforces the benefits of stress regulation on the immune system. Mood regulation benefits to emotions expression that are fundamental for communication.

SCIENTIFIC EVALUATION

A meta-analysis of scientific publications over the past 20 years assessed the effectiveness of horticultural therapy on cognitive decline, agitation level, positive emotions, and level of engagement in people living with dementia. The results indicated that there was a significant difference when individuals participated in an effective horticultural therapy programme, while there were no significant results on agitation and positive emotions when the relationship to the plant was purely ornamental^[7].

A second review of the literature on 23 articles, 8 of which were already meta-analyses, found a significant effectiveness of a horticultural therapy programme on the level of agitation. The effect was also particularly significant (+ 45%) on the impression of commitment and adherence to the activity^[8].

In 2022, a systematic review compiled 14 studies (4 randomised controlled trials and 10 quasi-experimental studies) involving 411 people living with dementia. The results showed significant differences in the effectiveness of participatory horticultural therapy on total cognitive function scores, agitation, positive emotion and engagement^[7].

A randomised controlled pilot trial studied the feasibility and effects of horticultural therapy on apathy in nursing home residents living with dementia. Not only is it possible to provide a programme of horticultural therapy activities adapted to residents, but it is also effective. The programme significantly reduced apathy and supported cognitive function, although the effects on quality of life and functional capacity could not be confirmed^[9].

The cost-effectiveness of horticultural therapy has not yet been sufficiently referenced

IMPLEMENTATION AND PRACTICAL ADVICE

A. Training and/or knowledge required to provide the intervention

A dual competency is required. It should be noted that no programme in France offers a degree in horticultural therapy. However, care staff can be made aware of this through continuing education. Diploma or certification courses are offered in the USA, Japan, and several European countries.

Horticultural therapist: care staff of all professional categories trained in the benefits of therapies through the relationship to nature, therapeutic gardens, horticultural activities, gardening, and horticulture.

Mediator gardener, horticultural therapy facilitator: gardening and landscape professionals trained in the care and support of a vulnerable public, the benefits of therapies through the relationship to nature, therapeutic gardens, and horticultural activities.

The High School of Horticulture and Landscape of Brive-Voulezac (France) has created in 2020 a Gardener Mediator specialisation. This professional title is based on the acquisition of four abilities: Design - Create - Manage/ Animating landscaping and edibles for social and/or therapeutic purposes - Agroecology/Solidarity between the forms of life.

In 2023, the first session of the University diploma Health and Gardens - Taking care through a relationship with nature (Santé et Jardins - Prendre soin par la relation à la nature) was delivered at the Université Jean Monnet in Saint-Étienne (France). Its aims are to contribute to the development of therapeutic gardens in health and medico-social facilities, to raise awareness of horticultural therapy and animal assisted therapy as complementary psychosocial interventions and to develop health and therapeutic gardens in the community.

HORTICULTURAL THERAPY

B. Practical and clinical advice

THERAPEUTIC INTENTION	RECREATIONAL INTENTION
<p>Participants profile</p> <p>People living with dementia. The professional will adapt activity to the participant profile, to his clinical situation, to the specific indications and his expectations if they can be formulated.</p>	<p>People living with dementia, voluntary or whose previous life history leads to think that this recreational activity will be particularly favourable.</p>
<p>Indications</p> <ul style="list-style-type: none">■ Global physical rehabilitation: musculoskeletal, cardiovascular, respiratory, sensory, appetite, sleep quality, fall prevention, trophic disorders.■ Cognitive maintenance: reminiscence, memory stimulation, verbalisation, action programming, praxis, temporal and spatial orientation, body schema.■ Behavioural and psychological symptoms: anxiety, withdrawal, depression, insomnia, restlessness, wandering, aggressiveness.	<p>Horticultural therapy sessions may be prescribed for recreational purposes when primary purpose is regulation of stress levels^[10] and recovery of attentional fatigue^[11]. Distraction, positive emotion, feeling of escape, familiarity with the place contribute to well-being.</p>
<p>Contra-indications</p> <ul style="list-style-type: none">■ No tetanus vaccination.■ Severe and uncontrolled Allergic Asthma.	<p>Idem. High risk of falls requires careful and tailored support during a visit of the garden.</p>
<p>Contributors</p> <p>Horticultural therapist, gardener mediator and care staff made aware of horticultural therapy. The indication is made by the health care team. For an individual session, the horticultural therapist works one to one. For a group session, the therapist is assisted by a care staff who is aware of the therapeutic issues of the intervention. In an institution where there is a therapeutic garden, the mediator gardener prepares the equipment and the site of the intervention. He assists the horticultural therapist during his or her intervention.</p>	<p>For a recreational and beneficial walk in the garden, the intervention can also be done individually or in groups. The mediator gardener welcomes, accompanies the walk and presents the garden. When the group exceeds two people, presence of volunteer visitor or family caregiver is necessary.</p>

THERAPEUTIC INTENTION	RECREATIONAL INTENTION
<p>Setting of intervention</p> <p>In institution, in person's or professional' home:</p> <ul style="list-style-type: none"> ■ In a garden designed for this purpose, a terrace, a greenhouse, or an equipped room. ■ In the person's bed or in the armchair near an open window. ■ Safe and comfortable (which requires accommodation). ■ With suitable equipment: tools, raised planter, tray or repotting table, horticultural therapy trolleys. 	<p>A garden, a patio, a terrace, indoors.</p>
<p>Dosage</p> <p>Individual or group sessions of 5 to 6 participants.</p> <ul style="list-style-type: none"> ■ Period: all year round. ■ Frequency: at least twice a week. When possible, every day. ■ Duration: half-hour in individual and 1 hour and 30 minutes in group. 	<p>Idem.</p>
<p>Session sequencing</p> <p>When possible: go around the garden, observe plants, awaken senses, observe reactions, and adapt activity. To be attentive, in the exchange, propose a simple gardening activity, achievable and soothing or targeted by the indication.</p> <p>For example: watering is generally appreciated and soothing. More structured workshops may be offered^[12].</p> <p>Recommendation: based on the indication, always adapt the proposed activity to the situation and encourage to maintain the session duration for an effective natural exposure.</p>	<p>The recreational outing always benefits from the mediator gardener's presence.</p>
<p>Observance / Attendance</p> <p>Unless opposed and according to indications, minimum compliance can be defined for an actual result.</p> <p>For example: decreased agitation and aggressiveness. A walk in the garden twice a day for 30 minutes or exposure to natural light from a veranda in the morning for 1 hour.</p>	<p>Not specified.</p>
<p>Assessment</p> <p>The therapist must be able to assess the person's abilities and adapt the activities.</p> <p>Sessions' evaluations are targeted from indications. They are carried out by both the horticultural therapist and care staff during and after the programme.</p> <p>Physical measures: heart rate and blood pressure at the beginning and end of the session.</p> <p>Well-being with the EVIBE scale.</p> <p>Behavioural disorders with neuropsychiatric inventory (NPI) short version (NPI-reduced) and care team version (NPI-ES) at the beginning and end of the programme.</p> <p>Quality of life with the QoL-AD questionnaire at the beginning and end of the programme.</p>	<p>Not specified.</p>

HORTICULTURAL THERAPY

FOR MORE INFORMATION

- French Federation of Gardens, Nature and Health: therapeutic gardens, horticultural therapy and ecotherapy: <https://f-f-jardins-nature-sante.org>
- American of horticultural therapy association: <https://www.ahta.org/>
- Canadian Horticultural Therapy Association: <https://www.chta.ca/>
- Trellis (Scottish Organisation): <https://www.trellisscotland.org.uk/>
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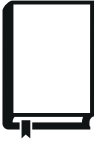
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France Criou is a consultant in therapeutic gardens, hortitherapy programmes and ecotherapies. Doctor of Medicine and Landscaper, she graduated in Psychiatric Phenomenology and is an active member of the French Federation of Gardens, Nature and Health of which she was Secretary from April 2018 to April 2021.

Isabelle Boucq is a psychologist and an active member of the French Federation of Gardens, Nature and Health of which she was President from April 2018 to April 2021.

KEY POINTS

- To provide physical rehabilitation, cognitive maintenance or management of behavioural and psychological symptoms.
- This intervention involves physical, cognitive, psychological and social processes.
- Observed effects are an improvement in general physical health, a slowing of cognitive decline, reduced agitation, a sense of well-being, the expression of positive emotions and the satisfaction of engaging in nature-related activities.
- In group, individually or with a family caregiver.
- For all people living with dementia, regardless of the stage of the disease.



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MULTISENSORY STIMULATION

Multisensory intervention

Multisensory stimulation room – Multisensory environment

Sensory room – Snoezelen room.

PRESENTATION

A. Definition

The term “multisensory stimulation intervention” can be used to encompass any intervention aiming to stimulate two or more primary senses, including, visual, auditory, gustatory, olfactory, tactile. A multisensory intervention is purposefully designed to provide an enriched experience that stimulates multiple sensory systems. Multisensory stimulation (MS) is often equated with the Snoezelen room (or multisensory environment), which is a widely used approach. The term Snoezelen (lit. “sniffing and dozing”) refers to a safe, comfortable, demand-free environment designed to stimulate all the senses^[1] frequently through the use of special equipment including e.g., coloured optic fibers, bubble tube lamp, aroma air spray, and digital interactive panels where colours, sounds, and images can be changed using a touch screen. The choice of supports and stimulation materials can also be very simple (perfumes, candles, lotions, etc.). Other interventions using different approaches have been developed, among them multisensory tools (e.g., twiddle muffs, memory blankets), multisensory themed boxes, and multi-dimensional programmes such as Sonas or Namaste Care^[2].

B. Fundamentals

MS interventions adopt a nondirective approach aiming to encourage people to engage with sensory stimuli as they choose^[3]. Among psychosocial approaches, MS has received great interest within the field of dementia care. This is due to the challenges posed by environments that may be either insufficiently stimulating or overwhelming for people living with dementia^[4]. MS interventions have been widely used, particularly for the management of responsive behaviours (agitation, aberrant motor behaviour, anxiety, irritability, depression, apathy, disinhibition, and delusions). MS interventions offer opportunities to optimise sensory stimulation and for meaningful interactions between people living with dementia and those who care for them. These interactions can be verbal and non-verbal, contributing to improved communication and boosting relationships. This makes MS interventions appropriate for those living with moderate to severe dementia^[4].

MULTISENSORY STIMULATION

THEORETICAL BACKGROUND

A. Processes involved

The theoretical underpinning supporting MS posits that responsive behaviours and cognitive impairment associated with dementia are closely related to sensory decline.

Due to age-related sensory changes (e.g., limited vision and hearing) which are exacerbated by the condition, people living with dementia may require more stimulation (strong stimuli, greater contrast between objects) in order to maximise perception. Consequently, the absence of appropriate activities and sensory enriched experiences put people living with dementia at risk of sensory deprivation, defined as a prolonged lack of stimulation^[5]. Empirical evidence demonstrates the detrimental effects of long-term sensory deprivation including changes in mood and behaviour such as depression, disorientation, irritation, apathy, and anxiety^[6].

As cognitive function deteriorates in dementia, the individual's ability to process and integrate external sensory information and to understand context are reduced^[7]. Therefore, overstimulating environments which may exceed an individual's tolerance threshold can generate or increase maladaptive behaviours such as aggression and irritation. Tailoring environmental demand and providing appropriate sensory stimulation supports people living with dementia to adjust and process information, reducing discomfort and confusion. In turn, MS may increase well-being, quality of life, social skills and support the management of behavioural manifestations of dementia.

B. Neurophysiological correlates

Sensory information is transmitted via neuronal networks to the brain, which interprets one's environment. Neuroscientific studies suggest that older people benefit more from receiving multimodal stimulation compared to unimodal stimulation, in performing tasks such as detection or according judgement^[8]. Sensory-enriched experience enables stimuli to be encoded into multisensory representations thereby activating a wider network of brain regions compared to those invoked by unisensory encoding, thus facilitating older peoples' task performance.

SCIENTIFIC EVALUATION

There is some evidence suggesting that MS has a positive impact on people living with dementia in reducing responsive behaviours (e.g., agitation, irritation)^[9-13], improving mood^[13-16], facilitating verbal and non-verbal interactions and interpersonal relationships with other care home residents and with carers^[17].

A few studies reported positive benefits for carers following MS interventions including reduced caregiver stress, increased well-being, and job satisfaction^[12-13,18]. However, the scientific effectiveness of interventions based on multisensory approaches is still fairly limited. The limited body of evidence, poor quality of studies, and variety of intervention protocols make it difficult to delineate an overall conclusion in relation to the effect of MS^[4]. Further research is needed to draw firm conclusions about its effectiveness and the key elements of different approaches to MS.

There are no cost-effectiveness studies to date. However, it is possible to speculate that MS utilising everyday objects e.g., perfume, candles, scented body lotion, since these are by definition highly accessible, hold promise as an individualised, easy-to-implement, cost-effective intervention.

IMPLEMENTATION AND PRACTICAL ADVICE

A. Training and/or knowledge required to provide the intervention

The authors suggest that MS facilitators should have training and education about dementia, good communication skills, and knowledge about the participants (e.g., past history, allergies, hobbies, etc.). This creates a person-centred care approach aiming to empower participants using bespoke activities created for each individual. This should result in appropriate support and engagement for people living with dementia, thereby improving overall well-being for both residents and care staff or family supporters.

B. Practical and clinical advice

The following practical guide is created for supporting the development and implementation of a MS intervention using themed boxes for people living with dementia^[19-23]. The example provided focusses primarily on tactile (touch) and olfactory (smell) stimulation. The following advice can also be applied to other kinds of sensory stimulation.

MULTISENSORY STIMULATION

THERAPEUTIC INTENTION	RECREATIONAL INTENTION
<p>Participants profile</p> <p>All people living with dementia, regardless of the severity of the disease.</p>	<p>Open to anyone.</p>
<p>Indications</p> <ul style="list-style-type: none"> ■ Cognitive: memory, sensory integration, attention, and executive functions. ■ Psychological: social interaction, mood, quality of life, well-being, communication, responsive behaviour, anxiety and depression. 	<p>Sensory stimulation, engagement in meaningful activity and socialisation.</p>
<p>Contra-indications</p> <p>Risk of allergic reactions; skin irritation; emotional distress due to overstimulation or negative memories.</p>	<p>Idem.</p>
<p>Contributors</p> <p>Occupational therapist; psychologist; psychomotor therapist; trained care staff or artist facilitator; two (or more) staff to support the session (if working in a group).</p>	<p>Anyone with good communication skills and knowledge of the participants.</p>
<p>Setting of intervention</p> <p>A quiet, relaxing, well-ventilated room with chairs and table. You might want to clear other items or smells (e.g., air fresheners) away and ensure you won't be disturbed during the activity. This will create space and quality time for you and the participants.</p>	<p>Quiet environment.</p>
<p>Dosage</p> <p>Group sessions of 5-6 participants.</p> <ul style="list-style-type: none"> ■ Period: 6 weeks. ■ Frequency: once per week. ■ Length: 15 minutes (preparation); 45-60 minutes (intervention). Participants should be given enough time to explore and comment on the materials according to their capacities. <p><i>The intervention can also be offered individually. In this case, it is important that the participant does not feel examined/tested.</i></p>	<p>Not specified.</p>

INTENTION THÉRAPEUTIQUE

Session sequencing

Item selection: think about objects that each people living with dementia (participant) enjoys now or in the past, including their preferred smells. You can ask them, find out more about their life, or investigate what was popular when they were in their late teens or early 20's. Create 6 themed activities (e.g., childhood, vacations) based on each participant's preferences. Place the selected items related to each theme (6-8 is a good number to ensure variety) in a box or case.

Introduce the activity: let the participants know that you would like to spend time exploring some interesting items together. Multisensory activity*: start by presenting one item to each participant or let them choose one from the box. Note how each participant interacts with the object (including smelling it if appropriate). Encourage each participant to handle and examine the objects. Allow them time to do this. When they are finished, you can handle the object and smell it as well and make comments, responding to what the participants said or did. Repeat, until all items in the box have been handled and discussed.

For individual sessions, it is possible to remove the objects from the box and display them on a table. The participant will be able to choose the objects that interest him/her. The facilitator can also choose the objects that attract the participant's curiosity and attention the most.

End session: thank participants for taking part and ask if they have any items or topic preferences for the next session.

Observance / Attendance

If an item does not interest the participants or they do not respond, you can move onto another one in the box.

Be aware that people living with dementia may have impairments such as a reduced sense of smell so do not worry if they do not respond. You may therefore choose items that have strong smells or focus on objects to handle and discuss instead.

People living with dementia may present physical impairment or pathologies that reduce mobility such as arthritis. If so, offer support to handle and explore the items.

Assessment

E.g., COMMUNI-CARE scale; Observation of the participant's verbal and non-verbal responses via video recording; Visual analogue scales.

INTENTION RÉCRÉATIVE

Introduce items and activity, allow participants time to handle, explore, and comment, if they wish.

Not specified.

Not specified.

MULTISENSORY STIMULATION

* Recommendations:

Allow time for participants to explore the object's sensory properties and to comment if they wish. Do not ask if they know what it is or what it is for as they may feel like they are being tested.

When you present a scent/smell, instruct the participant to breathe normally and present the next smell approximately 2-5 minutes later, to avoid overwhelming the senses.

If appropriate ask for opinions and not for factual information. For instance: do you like it? Does it have a smell? How does the object feel?

People who present communication impairments should be engaged at the sensory level e.g., handling and smelling items rather than discussing/commenting. It is recommended that carers engage with the participants' feelings and emotions expressed through facial expressions and body posture. An empathetic response may include verbalising the feelings and emotions observed.

FOR MORE INFORMATION

- Using memory box objects and smells for people with dementia: guidance for carers
<https://www.boots.com/resource/blob/2242822/fe77e02a5c72f32fb24561906b56e0e0/pdf-data.pdf>

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KEY POINTS

- To stimulate cognition, promote well-being, reduce anxiety and/or depression, stimulate communication and provide comfort.
- This intervention involves sensory, physical, cognitive, psychological and social processes.
- Observed effects are a reduction in agitation, improvement in mood and stimulation of social interaction.
- In group or individually.
- For all people living with dementia, regardless of the severity of the disease.

MULTISENSORY STIMULATION



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MUSIC THERAPY

Musical Intervention
Music Medicine – Neurologic Music Therapy

PRESENTATION

A. Definition

The World Federation of Music Therapy (WFMT) defines Music Therapy as the use of music and/or its elements (sound, rhythm, melody and harmony) by a qualified music therapist, with a patient or a group, in a process designed to facilitate and promote communication, relationships, mobilisation, expression, organisation and other relevant therapeutic goals in order to meet physical, emotional, mental, social and cognitive needs^[1]. There is a traditional differentiation between two main techniques: active music therapy, which consists of using sound-producing objects, musical instruments or the voice, and receptive music therapy based on the listening of music. In clinical practice, music therapists frequently combine the two techniques.

Music therapy is based on the close links between the constituent elements of music, the history of the subject, the interactions between the individual(s) and the music therapist. Thus, the interventions are individualised and adapted to the therapeutic goals defined by the music therapist, in consultation with the healthcare team when the music therapist intervenes in an institution.

B. Fundamentals

Historically, music therapy emerged in the field of therapies using artistic medium, initially with a relational and psychodynamic approach. Through the results of neurocognitive research in the field of musical cognition, using in particular brain imaging techniques, a better understanding of the neuropsychological mechanisms involved when listening to or playing music has enabled a renewal in music therapy practices, particularly in the context of neurological diseases^[2].

Musical interventions for people living with dementia are now supported by these scientific publications^[3]. In the early stages of the disease, when distress, depression and anxiety are associated with a drop in cognitive performance, musical intervention as a relaxation technique is very useful in reducing these disorders^[4]. At the severe stage of the disease, when verbal communication decreases and apathy becomes the most difficult behavioural symptom to manage, therapeutic musical interventions are particularly relevant to address apathy and stimulate verbal communication. Thus, at all stages of the disease, receptive or active musical interventions have complementary effects. Music can be relaxing or stimulating, and this dual quality brings to music therapy an undeniable interest in neurodegenerative pathologies.

MUSIC THERAPY

THEORETICAL BACKGROUND

A. Processes involved

To improve the specificity of approaches, it is essential to better understand the underlying mechanisms that lead to the positive effects of musical interventions. Three main mechanisms help researchers and clinicians optimally design interventions based on their therapeutic targets.

- Sensory and emotional appreciation: people living with dementia are able to perceive and understand the sensory and emotional connotations of musical elements and respond to it. They generally preserve their musical appreciation when other cognitive abilities (especially verbal) are completely impaired, even in severe stages of the disease. Although there is debate about the alteration of emotion perception in neurodegenerative diseases, aesthetic judgment and emotional appreciation seem largely preserved, particularly in Alzheimer's disease^[6]. This preserved responsiveness to music makes it possible to use the well-known emotional and neurophysiological effects of music on mood and behaviour.
- Memory processes: the memory of songs and old tunes listened to during their youth is very resistant to amnesia and semantic memory is relatively well preserved, even in severe stages of the disease^[6-7]. This could explain why music is an interesting medium in reminiscence therapy to trigger autobiographical memories and encourage patients to reconnect with their past and their identity. These memories could as well help reduce anxiety or depression. In addition, music could be used as a mnemonic to reduce verbal learning difficulties, particularly at the beginning of the disease.
- Social cognition: music is often a very social activity. Spontaneous listening to music often triggers a feeling of belonging to a social group and/or reminds the individual of their relationships. This social aspect of music can be crucial in supporting communication and connection between people, their families or caregivers^[8].
- Obviously other dimensions also explain the overall and generally positive impact on cognitive disorders and their behavioural consequences in patients. Music facilitates physical and motor engagement, inducing interesting physical stimulation to address balance and motor coordination disorders. Finally, activities involving music are often motivating for patients and not experienced as tedious exercises.

B. Neurophysiological correlates

It is well established that listening to familiar music has a stimulating effect, associated with the release of dopamine^[9-10]. It has the ability to awaken people and temporarily make them more present and efficient in different types of tasks. This could explain why music can sometimes alleviate apathy in people. Music chosen by the individual for the purpose of relaxation has been shown to reduce their feelings of stress, as well as the body's physiological response to stress (e.g., decreased cortisol^[11]). This could help explain why music can have a calming effect and reduce anxiety and aggressive behaviour. Thus, the emotions aroused by music would explain why music could facilitate the encoding of new information^[6,12].

SCIENTIFIC EVALUATION

The benefits of music therapy are sometimes difficult to demonstrate based on scientific research using strict evidence-based criteria^[13]. In the latest update of the Cochrane database review conducted in 2003^[14], researchers performed a meta-analysis involving 620 participants. Their conclusions are that a music-based therapeutic intervention likely reduces depressive symptoms but has little or no effect on agitation or aggressiveness. A meta-analysis carried out from 353 articles identified in 2017, corresponding to 1,757 participants assigned to an intervention group (music therapy) or a control group, shows that music therapy had positive effects on disruptive behaviours and anxiety and a positive tendency for cognitive functioning, depression and quality of life^[15]. Thus, year after year, the accumulation of experimental work and meta-analyses concerning musical interventions for people living with dementia constitute an undeniable body of evidence recognised by international authorities on the interest of this non-pharmacological approach in the support for these patients^[16].

The costs to take into account for setting up music therapy sessions correspond to the time of the staff supervising these activities (which is the least expensive solution) and possibly to the installation of a room dedicated to musical activities. Of course, even if institutions often lack resources, it is strongly recommended that the intervention be supervised by a professional recruited specifically for this purpose to increase its scope and effectiveness.

IMPLEMENTATION AND PRACTICAL ADVICE

A. Training and/or knowledge required to lead the intervention

To this day, there are several music therapy trainings in France and they are in the process of being recognised and harmonised. Training can be through university (DU, master, etc.) or private institute and approved by the French Federation of Music Therapists to guarantee minimum requirement criteria in terms of rigor of initial training. These diplomas integrate content in general psychology and psychology of aging, cognitive neuroscience and offer practicum training allowing future graduates to familiarise themselves with a population living with a specific pathology. In the management of neurodegenerative diseases, it is essential that practitioners understand individual's neurocognitive deficits and the consequences on their behaviour. Methodological skills are also taught so that practitioners can evaluate the impact of their interventions.

MUSIC THERAPY

B. Practical and clinical advice

THERAPEUTIC INTENTION

Participant profile

All individuals, regardless of the severity stage of the disease, can benefit from this type of intervention. Ensure that participants with hearing impairments are using a hearing aid properly.

Indications

- Behavioural (and mood) disorders: mainly anxiety and depression in the early stages ; apathy and language disorders in moderate to severe stages.
- Cognitive and motor stimulation: reminiscence therapy, stimulation of semantic, autobiographical and procedural memory, language control, motor coordination, balance, cognitive control functions (attention, concentration, planning).
- Social cognition: social interactions, cognitive and affective empathy.

Contra-indications / Points of vigilance

The implementation of music therapy for people with deafness or severe hearing impairments without hearing aids is more specific but does not constitute an absolute contra-indications. Some people may not be receptive to certain types of musical intervention. Beyond an assessment of auditory perception, it is therefore important to assess the relevance of implementing the use of music as individualised support tools. Since music can cause intense emotions, it is important to observe whether these are beneficial for the person.

Contributors

Preferably, practitioners should be dedicated professionals with training in music therapy specialised for people living with dementia.

The professional music therapist is a healthcare professional. He therefore knows and applies the ethical and professional rules of the profession, and works in strict compliance with the code of ethics which implies professional supervision.

Intervention framework

It is advised use a dedicated and adapted room, or by default to ensure that the activity is ritualised in the same institutional context or at home. The quality of the environment, the instrumentarium available, as well as the sound diffusion systems should never be neglected; the better quality the environment is, the greater the impact will be.

INTENTION THÉRAPEUTIQUE

Dosage / Implementation characteristics

Individual or group sessions of 4 to 8 participants.

- Period: cycle of 6 to 8 renewable sessions
- Frequency: at least one a week.
- Duration: one to one and a half hours per session.

Content of the sessions

1 Recall the context, introduce the participants; **2** Warm-up (in case of active interventions and singing tasks); **3** Content/work devices; **4** Ritualised closure, resuming a pleasant activity

Observance / Attendance

Mediation by a professional ensures the quality of compliance and compliance with therapeutic goals.

The professional's observations will make it possible to reassess needs, adapt individual goals and measures throughout the therapeutic process, while ensuring that people's well-being, comfort and quality of life are guaranteed.

Assessment

Cognitive and behavioural assessments

- In terms of psychosocial benefits, there are numerous geriatric scales to measure well-being or self-esteem, as well as mood scales [Behavior Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD), NeuroPsychiatric Inventory (NPI), Cohen-Mansfield Agitation Inventory (CMAI), ...].
- At the cognitive level, it is possible, for example, to measure the increase in the feeling of familiarity with a music heard within the sessions and to measure the quality of personal memories recall during the reminiscence tasks. Other cognitive measures are possible (see Platel & Groussard, 2020, 2023).
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MUSIC THERAPY

FOR MORE INFORMATION

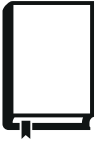
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- Fédération Française des Musicothérapeutes [French Federation of Music Therapists] (FFM): <https://www.musicotherapeutes.fr>
- Société Française de Musicothérapie [French Society of Music Therapy] (SFM): <https://francemusicotherapie.fr/>

ABOUT THE AUTHORS

This chapter was written by **Hervé Platel**, professor of neuropsychology at the University of Caen Normandy (UMRS Inserm U1077), in coordination with the **French Federation of Music Therapists** (FFM).

KEY POINTS

- To reduce signs of anxiety and depression and to learn new information in the early stages; to reduce psychological and behavioural symptoms in moderate to severe stages.
- This intervention mobilises motor, memory, emotional and social processes.
- The effects observed are a reduction in psychological and behavioural symptoms, the learning of new information, an increase in social interactions and an improvement in well-being and quality of life.
- In a group, alone or with the caregiver.
- For all people living with dementia regardless of the severity stage of the disease.



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FOCUS ON MUSIC CARE®

PRESENTATION

Music Care®, the first Medical Device (MD) to use music as a therapeutic tool, is based on musical composition algorithms specially designed to reduce stress and psychological and behavioural disorders. Music therapy is one of the non-pharmacological interventions recommended by the French National Authority for Health to manage specific behavioural symptoms in people living with dementia, whether or not they are institutionalised. Music Care® has been scientifically validated to provide an optimal approach to personalised care.

THEORETICAL BACKGROUND

Non-pharmacological interventions are recommended as the first-line option by the French national Authority for Health^[1] in the management of psychological and behavioural symptoms in dementia. Among these interventions, the medical device Music Care® has been the subject of several scientific publications showing its effectiveness on quality of life and behavioural symptoms associated with Alzheimer's disease^[2-5].

The positive impact of Music Care® on pain and stress is demonstrated at the neurophysiological level (synchronisation of physiological constants with tempo, activation of the dopaminergic system, release of endorphins), but also in the sensory, cognitive, affective, behavioural and psychosocial components linked to music (chosen according to personal taste, music allows you to respond to your own sensitivity).

SCIENTIFIC EVALUATION

Music Care® has been tested in over 60 clinical trials, including almost 20 randomised controlled trials (RCTs). It was evaluated on different mental health symptoms. As well as a physiological effect on haemodynamic and respiratory parameters, a psychological effect tends to encourage a 'listening' relationship between carer and patient, resulting in a significant reduction in the use of anxiolytics and antidepressants. In Alzheimer's disease, results have shown a significant 62% reduction in anxiety levels in the group that received Music Care® for 3 months at a rate of 2 sessions per week^[4]. Another study reported significant results in reducing refusal of care and aggressiveness. A significant 30% reduction in anxiety-inducing care time was observed with the use of Music Care® versus listening to the radio^[3].

IMPLEMENTATION AND PRACTICAL ADVICE

In order to meet the therapeutic objectives previously set by the carer, Music Care® offers:

- A U-shaped sequence to reduce behavioural symptoms and promote comfort.
- A L-shaped sequence to help fall asleep and improve sleep quality

Sequence of Music Care® interventions in institutions:

- Assessment of symptom(s);
- Individual prescription by the coordinating doctor;
- Explanation of the intervention to the patient;
- Identification of musical preferences;
- The patient must be in a comfortable position;
- Listening to the musical sequence ("U" or "L");
- Time to discuss the patient's feelings;
- Reassessment of the symptoms that led to the prescription.

The care staff, who have been trained beforehand, are given digital tablets with a varied choice of musical sessions available on the Music Care® application. Follow-up training is provided to the teams.

FOR MORE INFORMATION

- Music Care®: <https://www.music.care/index-fr.html>

ABOUT THE AUTHORS

Stéphane Guétin is a PhD in clinical psychology (National Institute of Health and Medical Research – INSERM) and a music therapist. He founded the Association of Music therapy Applications and Clinical Research (Association de Musicothérapie Applications et Recherches Cliniques – AMARC) in 2003 and the Music Care® Research and Development company in 2008.

Jacques Touchon is a professor of neurology and a specialist in Alzheimer's disease. He was director of the Behavioural and Degenerative Neurology Unit at Montpellier University Hospital (INSERM).

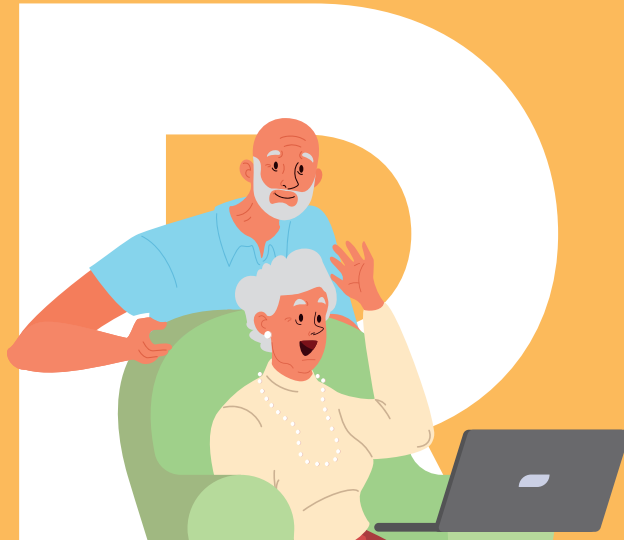
KEY POINTS

- Music Care® reduces behavioural symptoms (less agitation and aggressiveness), anxiety and improves quality of life.
- This approach promotes social interaction and the relationship between people living with dementia and carers.
- The effects of Music Care® involve sensory, emotional, cognitive, behavioural and social processes.
- Music Care® is a non-pharmacological intervention adapted to people living with dementia, in the mild to moderately severe stages.
- Music Care® can be used in groups or individually, in institutions or at home.



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REMINISCENCE THERAPY

Life story work – Life review therapy
Joint reminiscence groups

PRESENTATION

A. Definition

Reminiscence work with people living with dementia typically involves the discussion of past activities, events and experiences, usually with the aid of tangible prompts or “memory triggers” (photographs, household and other familiar items from the past, music and archive sound recordings). In recent years, digital storage and presentation of photographs, music and video clips have become widely used. In a group context, the aim is usually to evoke personal and shared memories and encourage communication. Life story work is often carried out on an individual basis and results in the production of a “life story book”, enabling the person to tell their life story from their own perspective. The “book” may be in digital or a conventional paper format. Where the individual reminiscence work involves evaluation of memories and their associated emotions, for example in a psychotherapeutic context, this is described as “life review therapy”.

B. Fundamentals

The first study on reminiscence work with people living with dementia was reported by Kiernat in 1979^[1]. Around that time, increasing interest in oral history meant that the reminiscences of elderly people were valued more greatly, with reminiscence seen as a natural and often adaptive process. Reminiscence triggers (objects, photographs and audio-clips) became widely available for use in day care centres, care homes and hospitals, leading many staff to establish some form of reminiscence work. These approaches have continued to grow in popularity in care settings in many countries.

THEORETICAL BACKGROUND

A. Processes involved

- Cognitive processes: remote memory, memory for past events, often appears relatively intact in dementia. Events may be recalled from childhood, whilst those from an hour ago are forgotten. Accordingly, reminiscence appears to capitalise on cognitive strengths. Research suggests that, in fact, remote memory across the whole lifespan is impaired but people living with dementia, like all elderly people, recall more memories from earlier life. Some of the memories represent well-rehearsed items or anecdotes. It is possible to envisage a disconnection between past and present, attributable to very low levels of autobiographical memory (memory for personal events) from the person’s middle years. Such a disconnection could contribute to difficulty in retaining a clear sense of personal identity. Reminiscence may therefore be a therapy that taps into the person’s strongest store of memories, enhancing conversation and communication relating to experiences and events in earlier life, and, by encouraging autobiographical memory, could reinforce a sense of identity.



REMINISCENCE THERAPY

- Affective processes: reminiscence also involves emotional processing: memories often have positive or negative associations. “Life review” is a structured, evaluative process, usually conducted individually, covering the whole life-story chronologically, seeking to integrate negative and positive memories, consistent with Erikson’s late-life developmental stage^[2]. Reminiscence, including life review, is consistently reported to benefit elderly people with depressed mood^[3-4] including those with depressed mood living in long-term care environments^[5]. As depressed mood is more common in people living with dementia, reminiscence may help to improve mood here also.
- Social processes: in a group context, reminiscence facilitates social interaction, helping group members find areas of common interest and experience as they get to know each other as individuals with diverse life-stories, leading to a sense of belonging and togetherness. In groups or one-to-one, staff providing care also learn about the individual, his/her experiences, interests, values, relationships, and preferences and so are better able to offer person-centred care, potentially enhancing quality of life.

B. Neurophysiological correlates

There are no studies to date on the neurophysiological correlates of reminiscence therapy.

SCIENTIFIC EVALUATION

Many studies have evaluated reminiscence therapy, but results are often inconsistent, influenced by different approaches (e.g., individual versus group; simple reminiscence versus life review) and settings (community versus institutional care). Reviews, including up to 23 randomised controlled trials with 1,763 participants, indicate improvements in:

- Quality of life^[6], notably in care homes^[7].
- Depressive symptoms particularly in institutional settings^[8] or associated with individual reminiscence^[6-7].
- Cognition^[8], most evident in care homes and individual reminiscence^[7].
- Communication, especially associated with group reminiscence^[7].
- Behavioural and psychological symptoms (BPSD)^[6].

Detailed evidence about cost-effectiveness is available from only two large-scale studies, including a total of 779 participants. Both evaluated joint reminiscence groups, where people living with dementia and their family caregivers participate together in an active programme covering themes across the life-span^[9]. They concluded that joint reminiscence groups are “unlikely to be cost-effective”^[10] and that they are “not cost-effective when considering outcomes for carers or most outcomes for people living with dementia”^[11; p.103]. However, when the costs included replacing time and input of the family caregiver, joint reminiscence groups were cost-effective in relation to a measure of quality of life of people living with dementia (the QoL-AD)^[11; p.103].

IMPLEMENTATION AND PRACTICAL ADVICE

A. Training and/or knowledge required to provide the intervention

All involved in reminiscence work should have a good understanding of the principles of person-centred care and practice as well as a training and/or awareness in dementia is necessary and recommended. No professional qualification is needed to work on a life story book with a person living with dementia nor to lead a small reminiscence group. All those undertaking life review therapy must make use of regular supervision or guidance from an experienced practitioner, providing the opportunity to discuss and reflect on the work undertaken. Those undertaking life review therapy with persons living with dementia who have significant depressive symptoms must have training and experience in counselling and therapeutic skills. Joint reminiscence groups have been led by a range of professionals – nurses, occupational therapists, clinical psychologists – and by those from a creative arts practice background.

REMINISCENCE THERAPY

B. Practical and clinical advice

LIFE REVIEW THERAPY	SIMPLE REMINISCENCE
Participants profile <p>People living with mild to mild/moderate dementia, preferably with supportive family member / friend to assist with identifying helpful photographs and memorabilia.</p>	<p>People living with mild or moderate dementia and, in joint reminiscence groups, family caregivers. Identifying profile of participants' interests before starting the intervention can be helpful.</p>
Indications <p>Low mood, social withdrawal, depressive symptoms, reduced quality of life.</p>	<p>To increase social interaction and communication, quality of life.</p>
Contra-indications <p>Alcohol-related dementia, high levels of agitation, uncorrected sensory problems.</p>	<p>Alcohol-related dementia, high levels of agitation, uncorrected sensory or communication problems. Survivors of abuse or people with post-traumatic stress disorder.</p>
Contributors <p>Typically a one-to-one therapy, with one person living with dementia and one facilitator / therapist. Family member may join for part of session.</p>	<p>Facilitator(s), assistants, volunteers, family members. In a group, minimum of two facilitators / assistants required.</p>
Setting of intervention <p>Office or quiet room in care home or community care centre or person's own home. Comfortable chairs, well-lit and ventilated, free from interruptions and background noise. Drinks available. Table for setting out memory triggers. Wifi for accessing internet resources.</p>	<p>Good-sized group room in care home or community care centre, well-lit and ventilated, with good acoustics, low background noise. Drinks and other refreshments readily available. Seats set around a table where memory triggers can be set out. Whiteboard and screen easily viewed by all. Wifi for accessing internet resources.</p>

LIFE REVIEW THERAPY

Dosage

Individual sessions.

- Period: from 8 to 12 weeks.
- Frequency: at least weekly.
- Duration: typically, 60 minutes session.

Session sequencing

- 1** Recap from previous session, check life story book so far;
- 2** Move onto next chronological phase of life-story with open, evaluative questions, using personal memory triggers to assist;
- 3** Plan next session – seek assistance of family in identifying appropriate triggers.

A break in the middle of the session is recommended.

Observance / Attendance

Lack of engagement can be addressed in the sessions and discussed in supervision. Can mean that greater efforts need to be made to identify appropriate memory triggers, or that the person has unhappy or traumatic memories that are difficult to discuss.

Assessment

Anxiety and/or depression with the Geriatric Depression Scale (e.g. GDS-15) and/or the Hospital Anxiety & Depression Scale (HAD);
Quality of life with the QoL-AD questionnaire.

SIMPLE REMINISCENCE

In individual sessions or usually in groups of 6-12 participants.

- Period: from 8 to 12 weeks.
- Frequency: at least weekly.
- Duration: typically, 60 minutes session.

- 1** Welcome and introductions;
- 2** Introduce theme for the session and relevant memory triggers, including photographs, memorabilia, and music;
- 3** Facilitate discussion, ensuring all participants have opportunities to share memories;
- 4** Plan next session, offering participants opportunity to contribute their own memory triggers to share with others;
- 5** A refreshment break is recommended, preferably to link in with the theme of the session.

Although many older people enjoy reminiscing, it is not universally enjoyed. Some people value privacy and find a group context difficult. People have different backgrounds, interests, and experiences, and so some participants may be less interested in some topics and themes. Unexpected unhappy or traumatic memories occasionally emerge, and facilitators need to be prepared to allow the person space, time, and support if this occurs.

Quality of life with the QoL-AD questionnaire. Communication with the Holden Communication Scale. Interest, enjoyment, and immediate well-being with smiley face scales.

REMINISCENCE THERAPY

FOR MORE INFORMATION

■ Social Care Institute for Excellence (UK):

- 1 'Reminiscence for people with dementia' (includes reading list, useful links, and resources etc.)
<https://www.scie.org.uk/dementia/living-with-dementia/keeping-active/reminiscence.asp>
- 2 'Creating a life story using technology' (includes useful tips and links)
<https://www.scie.org.uk/dementia/support/technology/creating-life-story>

■ Cochrane Collaboration:

- 1 'Do memories matter? Is reminiscence over-rated as a therapy for people with dementia?' Evidently Cochrane, June 2018 <https://www.evidentlycochrane.net/do-memories-matter-is-reminiscence-over-rated-as-a-therapy-for-people-with-dementia/>
- 2 Podcast 'Reminiscence therapy for dementia' <https://www.cochrane.org/podcasts/10.1002/14651858.CD001120.pub3>

■ Dementia UK:

'Life story work' (template and resources)
<https://www.dementiauk.org/for-professionals/free-resources/life-story-work/>

■ **European Reminiscence Network:** <http://www.europeanreminiscencenetwork.org/>

■ Recommended Reading:

- Gibson, F. (ed.). (2019). *International perspectives on reminiscence, life review and life story work*. London: Jessica Kingsley.
- Kaiser, P. & Eley, R. (eds). (2016). *Life story work with people with dementia: ordinary lives, extraordinary people*. London: Jessica Kingsley.

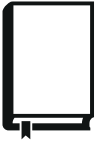
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KEY POINTS

- To decrease depressive symptoms, avoid social withdrawal and improve communication, social interaction, quality of life, mood.
- This intervention involves cognitive, social and emotional processes.
- Observed effects are an improvement in quality of life, cognition, communication and a decrease in behavioural and psychological symptoms.
- In group, individually or with family caregiver.
- For people living with mild to moderate dementia.

REMINISCENCE THERAPY



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DIGITAL DEVICES FOR PSYCHOSOCIAL INTERVENTIONS

INTRODUCTION

An increasing number of digital devices are being introduced in healthcare and social institutions, including virtual reality with head-mounted display, augmented reality, digital tablet games, robots, and more. However, it is crucial to fully understand what these devices are and what tangible benefits they can bring to people living with dementia and their family and professional caregivers. Special attention must be given to defining terms and considering factors that make their use meaningful. Specific examples illustrating their relevance in practice are presented in the following chapters.

DEFINITIONS

In this section, certain definitions are highlighted to prompt some reflections. While it is common to hear about “technology” (“gerontechnology”, “technology for health and autonomy”), we prefer other designations for this word due to its overly general meaning, which can be somewhat distant from the practical application. Firstly, the term “digital device” is used to refer to the ensemble in which professionals, individuals with medical conditions, families (or any other participants), and the digital tool interact within the context of non-pharmacological interventions (NPI).

The digital tool is defined as a technical object, meaning a manufactured object that inherently includes a kind of “user manual”. It is considered digital if it incorporates computer programmes enabling it to process incoming information (such as motion sensors) to provide specific outputs (such as sound production). It is crucial for users to understand the following schema to effectively appropriate the tool.

The functionalities of these tools are designed to address the anticipated “needs” of future users, with specific responses expected in relation to what is proposed. Furthermore, the operating modalities (power supply, the necessity of a support system, etc.) contribute to the dynamics of the digital device.

Moreover, the use of the tool by professionals intending to use it as a mediator requires prior preparation in order to carry out their practice as comfortably as possible within the framework of NPI. The choice of the tool lies with the professional, guided by therapeutic indications defined by their own practice and/or recommendations regarding NPI. It is then the responsibility of the professional, through their appropriation, to assume their role within the device by maintaining interactions with both the tools (familiarisation, interest, understanding of technical possibilities and limitations) and individuals with medical conditions and any other participants. This is essential for achieving activities that truly fall within the scope of NPI.

Schema of information processing using a digital tool



EXAMPLES OF DIGITAL TOOLS

Currently, a myriad of tools are available. Due to technological advancements, conducted studies, and their acceptance within the healthcare and socio-medical field, their number and functionalities continue to grow, and it is certain that they will evolve rapidly in the coming years.

Touchscreen tablets (standard or specialised) are highly prevalent in institutions today. Beyond the ability to communicate remotely with loved ones, they also offer functionalities (voice and video recording, games, etc.) that can serve as interesting supports for NPI.

With these same functionalities, but with a design that introduces additional potentials (such as mobility), robots have entered this field. Depending on the intended task (diagnostic assistance, improvement of certain abilities, etc.) and the role one seeks to assign to them with the individuals being supported (“play companion”, mediator, model, etc.), these robots can vary in their presentation (zoomorphic, humanoid, mobile platforms, etc.). One of the following chapters introduces animaloid social robots.

Two other chapters provide insight into possible resources, namely tools that allow the utilisation of augmented reality or virtual reality. They provide the opportunity to enhance the experiences offered to individuals and their relatives.

Finally, among the numerous digital objects, it is also essential to be aware of objects designed to provide access to specific activities (musical kiosks, connected bicycles, etc.).

Regardless of the type of object and its significance, it remains crucial to consider each time how they fit into the systems and more broadly into their context of use (institution, home, etc.). It is undoubtedly important not to be captivated solely by the object and to approach it in all its complexity.

DIGITAL DEVICES FOR PSYCHOSOCIAL INTERVENTIONS

SPECIAL CONSIDERATIONS IN THE USE OF DIGITAL TOOLS

Due to their specificities, digital tools require particular attention to several factors:

- **Technical Factors:** considerations about the storage of the object and its accessories (charger, remote control, etc.) should be planned in advance to facilitate its use and accessibility. Additionally, factors related to internet connections or electrical power must be taken into account for usage reasons (to prevent disruptions during sessions) or safety concerns (hanging cables can be hazardous). The overall setup of the device (chairs, lighting, room, etc.) should also be integrated into team discussions, as certain locations may complicate usage for some teams, and specific tables may be constantly moved by colleagues, requiring time to be repositioned for activities. This can introduce new tasks for professionals that should not be overlooked.
- **Bodily Factors:** understanding the impact of these objects on users' health is essential for taking appropriate precautions and decisions. Technical objects unconsciously influence our bodily conduct (imposing specific gestures, a sequence for their execution) and constrain our postures, which, in turn, affect how we physically engage with them. They also contribute to the organisation of our interactions (waiting for an action before being able to engage in a conversation, for example). These constraints may sometimes conflict with the usual practices of professionals or the mode of interaction they seek to establish with those they support. Discussing these conditions also means providing a framework for characterising each team member's work and the possible or impossible changes they can bring.
- **“Gnoseological” Factors (Knowledge-related):** the use of an object often comes with a technical vocabulary and knowledge, including understanding how to appropriate them. Possessing or lacking these skills can subtly redistribute roles within the institution. Establishing team communication can once again help avoid potential tensions arising from these changes.
- **“Axiological” Factors (value-related):** beyond individual interests and the satisfaction everyone seeks from using these tools, questions about the values accompanying the work, and even ethical controversies, can be central to team discussions. The data collection facilitated by these technical objects requires informing all stakeholders and ensuring their protection.

- **Economic Factors:** consideration must also be given to external service providers (such as the manufacturers offering the tool). These new relationships are inevitable, whether due to updates, after-sales service, or the licenses they require. The object also encapsulates an economic model that should not be overlooked.

These factors should be collectively considered before making an investment. Indeed, once the initial “wow” effect subsides, the tool may end up unused due to these “details”. Sometimes, it takes time for a practice to stabilise.

CONCLUSION

As detailed in the upcoming chapters, numerous digital technical objects are currently being introduced in geriatric care, proving highly beneficial for NPI. However, experience shows that acknowledging the dynamic co-evolution of the object and the environment (social, technical) is a key factor for success.

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VIRTUAL REALITY WITH HEAD-MOUNTED DISPLAY

PRESENTATION

A. Definition

In the field of healthcare, head-mounted display virtual reality (HMD-VR) refers to immersive digital devices worn on the face. These devices immerse the user in a realistic immaterial environment by broadcasting 360° images of the real world or images of environments computer-modelled in 3D. Some systems are limited to the visual reproduction of head movements and are suitable for contemplative interventions in a seated position, while others also allow physical movement in the virtual world and provide a greater interactive experience.

B. Fundamentals

The therapeutic value of head-mounted display (HMD) is based on two concepts:

- immersion: forgetting the current use of the HMD.
- sense of presence: impression of physically existing in the virtual world.

These place the participant in an ecological situation, an environment close to the usual world which facilitates skills and feelings transferability.

THEORETICAL BACKGROUND

HMD-VR allows to:

- Stimulate cognition^[1-2], working memory and attentional processes through interactive memory tasks^[3]. Decision-making and planning can be encouraged, as can reminiscence through immersion in familiar environments;
- Reduce mood disorders (anxiety-depressive syndrome and neuropsychiatric disorders) and behavioural and psychological symptoms (quiet and relaxing environments)^[4];

- Promote greater self-esteem and encourage individual expression through small-group sessions for example;
- Mobilise participants' engagement by creating interactive and environments;
- Improve physical skills through specific exercises (balance, motor control) and reduce the risk of falling;
- Promote more social interactions to encourage social links, prevent isolation and promote well-being^[5-6];
- Transpose the learning of in-virtuo skills to the in-vivo world, using ecological situations reflecting the usual physical world.

SCIENTIFIC EVALUATION

In gerontology, there are a number of therapeutic or recreational uses for HMD. Their use has shown beneficial effects on the following health indicators:

- Intensity and frequency of behavioural and psychological symptoms can be reduced with appropriate use of HMD^[7].
- Decline in cognitive functions such as memory, spatial navigation or executive functions can be slowed^[8-9]. It is not clear whether HMD have a better effect than interventions using interactive screens^[10].
- HMD-VR is useful for creating social links between residents and their families. Indicators of well-being and quality of life can be improved^[6].

The literature focuses mainly on people living with mild or moderate cognitive impairment. Little is known about the effect of headset interventions on people living with severe cognitive impairments.

IMPLEMENTATION AND PRACTICAL ADVICE

A. Training and/or knowledge required to provide the intervention

The therapeutic use of HMD is reserved for healthcare professionals, psychologists and paramedics trained in the specific use of each device by the manufacturers and trained and/or aware of dementia. Recreational use is possible with a trained support professional.

VIRTUAL REALITY WITH HEAD-MOUNTED DISPLAY

B. Practical and clinical advice

- The contra-indications to the use of HMD are a medical history of epilepsy, pacemaker use, hallucinations and severe blindness.
- A typical session consists of 3 phases:
 - 1) An introduction to inform the person of what they are about to experience, check that they are ready for it and focus on the objectives of the session.
 - 2) A maximum exposure time of 20 minutes is recommended to avoid undesirable effects. Clearing the space to avoid collisions during movement.
 - 3) A time to conclude and discuss the session. A low light is appreciated when the HMD is removed.
- Wearing HMD can be experienced as intrusive. To facilitate acceptance, it is possible to give people control over their exposure by presenting the HMD as a pair of binoculars to be held in the hands.
- HMD can provoke undesirable effects such as headaches, stomach aches, nausea, unusual sweating, irritation of the skin on the face and temporo-spatial disorientation. These generally disappear within 30 minutes. If these signs appear, exposure should be interrupted, and the person accompanied until the symptoms disappear.

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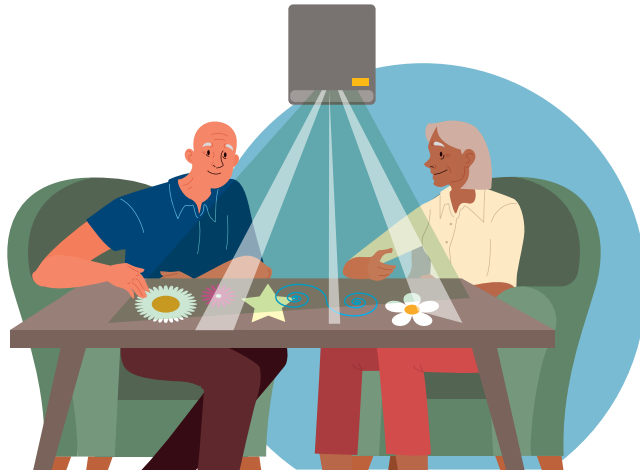
KEY POINTS

- Improved cognitive skills.
- Reduction in behavioural and psychological symptoms.
- Improved social interaction and quality of life.
- A typical session contains 3 phases (introduction, exposition, conclusion).
- Vigilance regarding possible undesirable effects.
- Suitable for people living with mild to moderate cognitive disorders.



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AUGMENTED REALITY

PRESENTATION

A. Definition

Augmented Reality (AR) refers to the ability to add virtual elements in real time in two or three dimensions (2D or 3D) to elements of the usual environment through a technical device. Interactions with these elements are possible. This content can currently be obtained through light projection tools (mounted on the ceiling or on stands) or digital applications from a device (computer, tablet, etc.). In the case of 3D AR, markers such as figurines, images, QR codes, etc., can be used. They provide their digital content as soon as a camera detects them.

B. Fundamentals

Augmented Reality has a history of over 40 years. The industrial sector, particularly aerospace, was the first to take an interest in the involved processes (cognitive, physical, psychological, and social). These initiatives drew attention from the medical field and encouraged the development of research and new tools intended to assist or diagnose cognitive disorders.

THEORETICAL BACKGROUND

Depending on the objectives assigned to activities carried out with AR, various processes can be involved:

- Physical and sensory processes: motor skills (fine and gross), sensory stimuli, perceptual abilities, walking and balance, motor coordination;
- Cognitive processes: language production and comprehension (oral and written), mnemonic abilities, logical-mathematical abilities, executive functions, body schema, flexibility, social cognition;
- Behavioural processes: engagement in the activity, calming, expression of emotions, pleasure, creativity;
- Social processes: social interactions, language pragmatics (exchange regulation, turn taking, etc.), social connections between individuals and with caregivers (family members and professionals).

Depending on the objectives set for the activities, different brain areas and zones may be engaged (motor, somatosensory, cerebellum, emotion centres, memory, language centres, etc.) and may trigger the release of «well-being» hormones.

SCIENTIFIC EVALUATION

Studies on rodent models of Alzheimer's disease (acknowledging the epistemological limitations inherent in these models^[1]) demonstrate that an improvement in memory performance and stimulation of brain plasticity are observed through environmental enrichment^[2].

Since the Covid-19 pandemic, further experiments are being conducted to assess the benefits of AR (in 2D and 3D) for people living with dementia. Despite methodological limitations inherent in any evaluation of non-pharmacological interventions (NPI)^[3], they show promising potential to strengthen and/or maintain activities of daily living and combat social isolation^[4-5]. Effects in other domains have been evaluated and can be considered transferable.

For example:

- Psychologically, managing anxiety or increasing positive emotions^[6],
- Behaviourally, stimulating social and sensory interactions, and increasing satisfaction^[7],
- Physically, managing chronic pain^[8],
- Cognitively, stimulating attention^[9].

Augmented Reality can also be addressed to caregivers and professionals to enhance their understanding of the pathology.

IMPLEMENTATION AND PRACTICAL ADVICE

A. Training and/or knowledge required to provide the intervention

There is currently no legislative and/or professional framework for the use of AR tools with people living with dementia. Nevertheless, AR can be associated with digital health interventions^[10] as part of preventive, therapeutic, or curative activities led by a healthcare professional trained in the use of psychosocial interventions.

AUGMENTED REALITY

B. Practical and clinical advice

It is essential to understand the functioning of the tool to propose appropriate and adapted activities. Depending on the given objectives, interactive projection tools can be used on various surfaces (table, floor, etc.) and can be accompanied by utensils (straws, rackets, etc.).

Psychosocial interventions using AR are suitable for all individuals living with dementia, regardless of the severity stage of the disease. Therapeutic indications include social, cognitive, sensory, physical, emotional stimulation, as well as the management of psychological and behavioural symptoms. Contra-indications concern 3D AR and include cybersickness (nausea, headaches, etc.), sleep disorders, and epilepsy.

A session (individual or in a group of up to 6 people) lasts a maximum of one hour, either in a flash mode or planned (once or twice a week). It follows an intensity curve with games stimulating engagement, followed by more intense activities according to the objectives, and calm activities to conclude the session. Participants are encouraged to engage at their own pace, based on their capabilities.

Evaluation is based on the targeted objectives. For recreational purposes, the indication is the well-being and pleasure of individuals participating. Work with families or intergenerational meetings can be organised.

FOR MORE INFORMATION

■ French mission report on virtual reality and augmented reality:

<https://www.vie-publique.fr/rapport/276458-rapport-sur-la-realite-virtuelle-et-la-realite-augmentee>

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KEY POINTS

- For all individuals living with dementia, regardless of the stage of the disease.
- Individually, in groups, with family members, intergenerational activities.
- Sensory, physical, emotional, social, and cognitive stimulation; calming of behavioral disorders.



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ANIMALOID SOCIAL ROBOTS

PRESENTATION

A. Definition

Animaloid robots are social robots with the appearance of animals, for example a baby seal (PARO), a cat or a dog (JustoCat, Joy For All Companion Pets). They are equipped with sensors (tactile, luminous, auditory, posture) that enable them to react to sounds, movements and cuddles. These sensors can be used by certain robot models to adapt their behaviour to the environment, modulate their signals to the user's responses and encourage the user's involvement in the robotic intervention.

B. Fundamentals

Robotic mediation provides an opportunity to interact with the patient, particularly when the severity of cognitive impairments significantly affects communication, and to develop an effective therapeutic alliance. Robotic mediation can also contribute to reduce the subjective burden on carers (overall effort required for care, frustration) by reducing behavioural symptoms difficult to manage.

THEORETICAL BACKGROUND

Animaloid robots can:

- Focusing the person's attention on the soothing and reassuring sensory stimulation (tactile, visual, auditory) provided by the robot in the management of psychological and behavioural symptoms (opposition, wandering, agitation/ aggressiveness) in people living with major neurocognitive disorders.
- Facilitating social interaction (using the robot as a topic of discussion). The robot is used as a mediation device for people with communication and social interaction difficulties (apathy).

- To act as a cognitive distractor (distraction having an analgesic effect on pain) and/or emotional distractor (positive emotional states reducing pain) in the management of pain and/or stress related to care. For example, the robot is used with people living with severe dementia, accompanied by painful tendon retractions during care, or with patients with pain from cancer.
- Promote cognitive stimulation by providing reminiscence support (talking about pets, visits to the zoo, trips taken, etc.).
- Provide a sense of comfort and security when managing psycho-affective symptoms by encouraging the person to focus on a pleasant experience and/or memory (tactile and sensory experiences provided by the robot).

SCIENTIFIC EVALUATION

Many authors have shown that most elderly people who experiment with animaloid robots accept them and enjoy handling and interacting with them^[1-3]. Some elderly people do not enjoy interacting with animaloid robots^[4]. They may be people who fear interacting with animals because of previous traumatic experiences with them.

The most robust studies on the impact of animaloid robots concern the PARO robot and highlight several benefits of interventions using this robot in geriatric settings: a reduction in psychological and behavioural symptoms (e.g. anxiety, depression, agitation)^[5], an improvement in quality of life^[6], a reduction in the use of psychotropic and analgesic drugs in people living with major neurocognitive disorders^[7], and a reduction in behavioural manifestations of acute pain during care^[8]. Using the robot can also promote communication, verbal and tactile contact, and the sharing of feelings by taking on the role of a “social facilitator”^[9-10].

IMPLEMENTATION AND PRACTICAL ADVICE

A. Training and/or knowledge required to provide the intervention

It is important to be familiar with the functionalities of the robot, how to programme behaviours adapted to therapeutic needs, how to solve simple technical problems and how to recharge and clean the robot. It is also important to be aware of the precautions to be taken when using the robot, to know how to present it to the patient, to be aware of its effects, and to know how to adjust the therapy to the patient’s reactions. Training and/or awareness in dementia is necessary and recommended.

B. Practical and clinical advice

Before implementing robotic interventions in an institution, it is advised to:

- Discuss with care staff how animaloid robots could help meet people’s needs. Their involvement in the project is key to its success.

ANIMALOID SOCIAL ROBOTS

- Ensure that care staff have the necessary human resources to provide robotic interventions.
- Examine the different models of animaloid robots available and choose the one that seems to best meet the needs of the intended public.
- Train care staff to provide robotic interventions. Plan new distance training sessions.
- Identify the people who could potentially benefit from robotic intervention. Request their consent and inform their families.
- Define the general structure of the intervention programme (number of sessions, setting, location, duration, frequency) and the sessions (content, exercises, etc.). The robot can be used in small groups (4 to 6 participants) or individually, depending on the objectives and needs, generally under the supervision of a professional.
- Define a method for monitoring robotic activity.
- Discussing the results of the robotic intervention during debriefing sessions with care staff, addressing any ethical and deontological questions that they may have.

FOR MORE INFORMATION

Pino, M., & Rigaud, A.-S. (2021). L'utilisation des robots thérapeutiques pour les personnes âgées. In S. Tisseron & F. Tordo, *Pratiquer les cyberpsychothérapies—Jeux vidéo. Réalité virtuelle. Robots*. (p. 183-192). Dunod.

KEY POINTS

- Robotic intervention, when indicated, must be integrated into the overall care and support plan.
- The protocol for introducing and using the robot must respect the person's perception of the robot.
- Professionals who use social robots in their work should receive training and regular monitoring to familiarise themselves with the technology and adapt mediation to the needs of the care they provide.
- Implementing these interventions requires human and material resources that must be taken into account, but the benefits obtained may compensate for the investment required.
- A strict robot hygiene protocol is essential to avoid the risk of transmitting of disease.

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FOCUS ON PARO



PRESENTATION

PARO is a robot seal that uses sensors and an analysis algorithm to interact by moving its head and flippers, and making animal noises to express joy, surprise or discomfort. PARO can be used to mediate the relationship between two people by encouraging the emergence of social situations and interactions. This system can be compared to animal mediation in its implementation and indications, while limiting the possible negative effects of the relationship with the animal (memories of bites, scratches, barking) and certain organisational constraints (care of the animal, hygiene, food, safety). This device is particularly adapted for people living with dementia at all stages of the disease.

THEORETICAL BACKGROUND

PARO gives the opportunity to create a new world between the real and the imaginary, in a 'as if' activity. What happens in the fictive world is very real for those who experience it. It's a question of playing for real something that is false. The emotions and affects present in the game are therefore real, particularly empathy for the robot.

PARO involves cognitive processes (cognitive and memory stimulation, imagination and play), psychological and behavioural processes (relaxing effect with reduced stress and anxiety, expression of emotions, feeling of take care and pleasure), social processes (listening, improving and facilitating social interaction, communication and quality of life), physical and sensory processes (touch, managing physical pain by diverting attention during care, lowering blood pressure, heart rate and spasticity).

SCIENTIFIC EVALUATION

The use of the PARO robot has shown positive effects on preventing loneliness, self-confidence, social interaction, communication, quality of life and psychological and behavioural symptoms (depression, apathy, anxiety, irritation, aggressiveness)^[1-3]. According to these studies, the presence of the robot promotes verbal and tactile contact, the expression and transfer of feelings and, in some cases, the recollection of past memories. The improvements in communication between elderly people in nursing homes and their interaction with care staff have also been highlighted in many studies^[4-5].

During interaction with PARO, a stimulation and an increase in cortical neuronal activity are observed in the areas corresponding to the recognition of emotional expressions and gestures, as well as those corresponding to speech^[1].

IMPLEMENTATION AND PRACTICAL ADVICE

PARO is an easy-to-use Class 1 medical device. Training is needed to present the robot to individuals and families and to ensure that care staff understand the challenges and possibilities. PARO is used in individual sessions lasting a maximum of 15 minutes with specific indications (anxiety, pain, reminiscence, etc.) twice a week and whenever the need arises; or in groups to encourage social interaction during weekly 30-minute sessions.

The professional presents PARO and places it on a table accessible to the participants in order to establish an initial contact. Participants are then invited to enter the game and interact with PARO: "Oh, it's moving its head", "It's looking at you", "Would you like to pet it?". At the end of the session, the professional invites participants to say goodbye and takes back the robot.

FOR MORE INFORMATION

- The PARO robot: <https://www.phoque-paro.fr>

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Marie-Line Carrion-Martinaud is a psychologist and associate member of the Institute for the study of human-robot relations (IERHR, Paris), and a PARO trainer in the Auvergne-Rhône-Alpes region (France).

Cédric Maizières is an engineer graduated from the Ecole des Mines and holds a Master's degree in economics. He is the director of Inno3Med, which introduced the PARO robot to France in 2014.



KEY POINTS

- To develop communication, well-being and memories, and to overcome aggressiveness, loneliness and pain.
- This intervention involves cognitive, psychological, behavioural and physical processes.
- Observed effects are an improvement in communication, quality of life and memory recall, as well as a reduction in stress, aggressiveness and feelings of loneliness.
- In a group, alone or with family caregivers.
- For people living with dementia at all the stages of the disease.

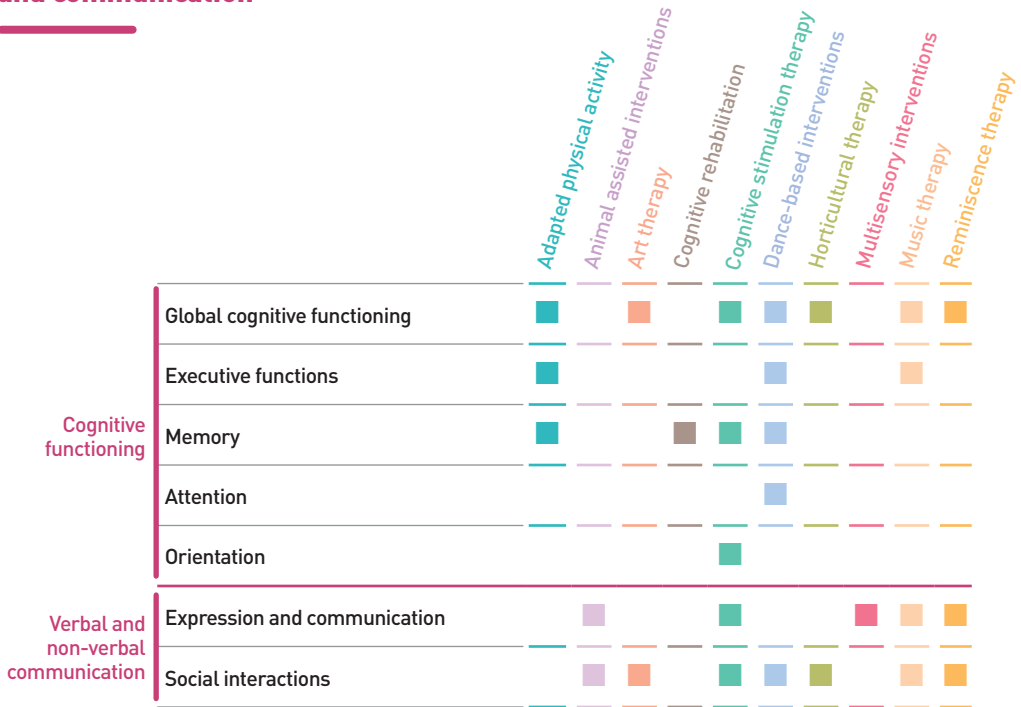


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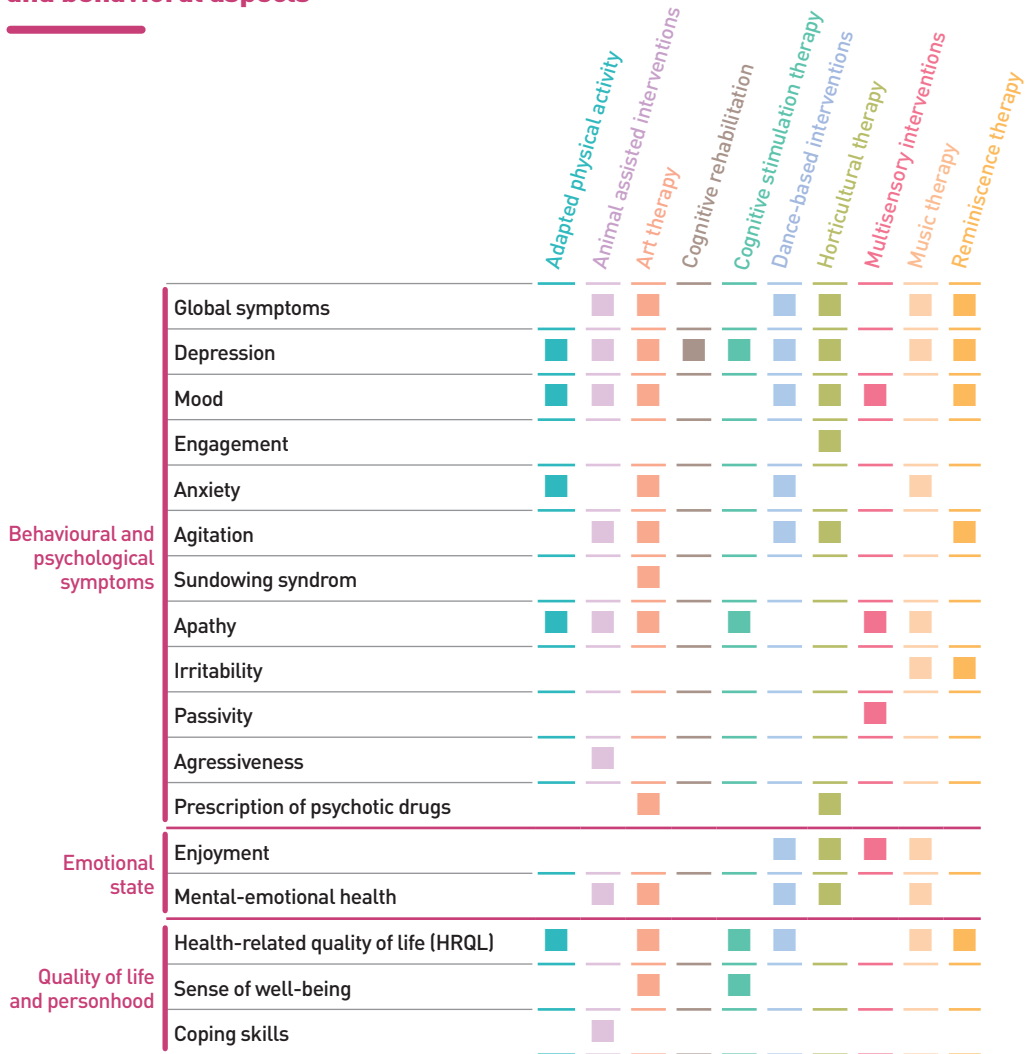
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SYNTHESIS

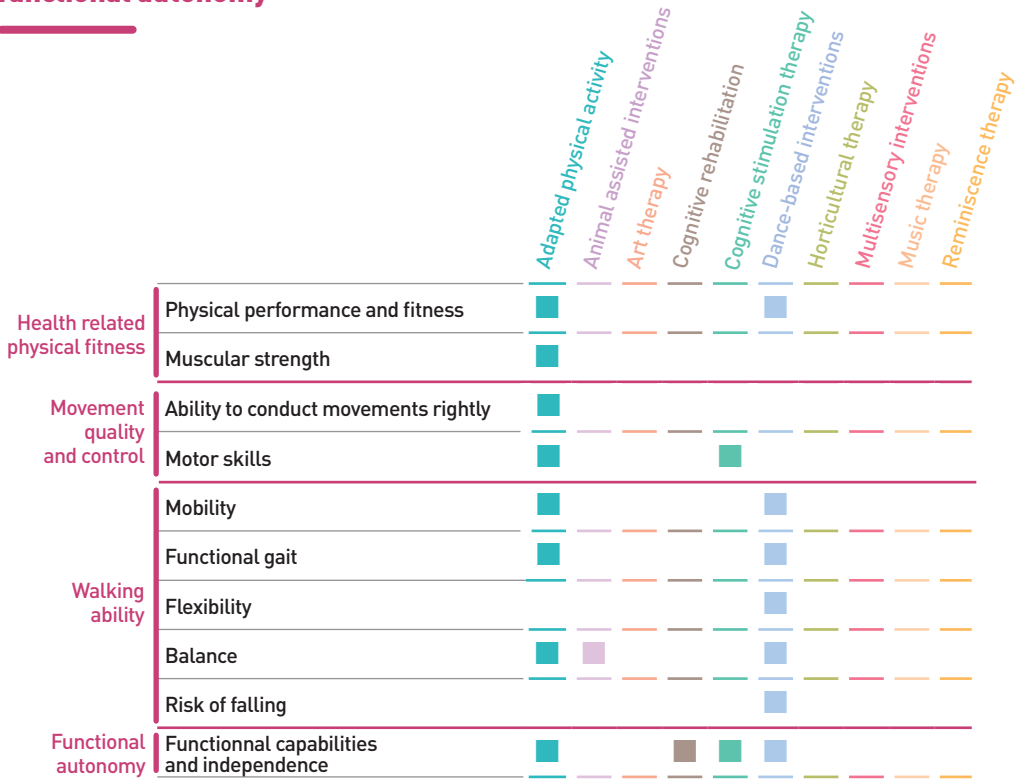
Cognitive functioning and communication



Psychological and behavioral aspects



Physical and functional autonomy



ABOUT THE FONDATION MÉDÉRIC ALZHEIMER

The Fondation Médéric Alzheimer has been developing research in the human and social sciences and in public health for 25 years, contributing to the growing of knowledge about dementia and its consequences, helping to support professionals, change perception of dementia and build a more inclusive society.

The Fondation Médéric Alzheimer develops a global vision of dementia and implements a multidisciplinary approach: biomedical, medico-social, legal, economic... This approach makes it possible to understand dementia in all its dimensions, both in France and internationally.

The strength of the Fondation Médéric Alzheimer is to combine scientific expertise with the support and conduct of innovative field projects to provide better support for people living with dementia and their families.

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