

# A sensory garden in dementia care: From design to practice Balerna Diurnal Therapeutic Centre

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## Abstract

**Aims and objectives:** Sensory gardens are supposed to be beneficial to improve mental well-being in vulnerable people. Our aim was to investigate how regularly attending a sensory garden can improve both quality of life and social interactions in elderly people with Alzheimer's disease.

**Background:** A newly designed sensory garden in an elderly daytime health care center in Balerna in southern Switzerland is accessible almost all year long.

**Architectural design:** The Balerna diurnal therapeutic Centre Pro Senectute had a garden that its patients, who are aged people affected by cognitive disturbances, were prevented to enjoy by several architectonic barriers. The garden, composed of two levels placed at two different heights, was abandoned. A specific architectural project has been studied and realized in order to provide a sensory garden.

**Medical study design:** Fifteen elderly individuals have been regularly attending the garden since September 2014 (Age: 69-87 yrs.; 4 males; 11 females).

**Methods:** Caregivers were assessed with the Caregiver Burden Scale before their family members entered the program. After three months experiencing the garden, all caregivers were administered a shorter version of the same questionnaire. This includes questions regarding specially designed features like a Dali sculpture representing a huge thorn clock, a water fountain and wooden ramps to assess how people with dementia react to art and design.

**Results:** All subjects except one, a 73-years old man, felt calmer and relaxed after attending the garden for 90 days. Eleven subjects enjoyed the scents and fresh air. Twelve people, including the four men, enjoyed the most walking the ramps, which are "the way back home". Nobody paid any attention to the sculpture as a piece of contemporary art but as "a broken clock" that raises a lot of conversation. Ten subjects enjoyed the fountain and flowing water. All 15 drank the water, no urinary incontinence because of flowing water.

**Conclusions:** The garden is demonstrating to counterbalance aggressiveness and anxiety. It seems to fully satisfy one's wandering more on the ramps than on the base circuit while sensory stimulation is a priority. Specific architectural design and public health programs promoting such activity should be encouraged to avoid both, excess of psychotropic medicines, improving socialization and mental stimulation.

## Introduction

Cognitive disturbances distort the capacity of orienting oneself in space and time and the faculty of discerning shapes and colours; ageing and its connected pathologies bring along a progressive decrease of self-sufficiency, and, as a consequence, of mobility skills. Because of this, planning an area intended for people affected by dementia or ambulation problems has to address specific requirements. The "Sensory Garden" is a recognizable and reassuring place, in which to experience a sense of freedom and relax. At the same time, it was conceived with a sensory stimulation therapeutic program in mind [1-8]. It is an open but well delimited and protected space, appearing as an accessible, simple, and tidy "normal" garden with a sense of serenity and well-being to counterbalance aggressiveness [9,10]; thus, the garden becomes a therapeutic device in itself. Closed spaces tend to cause states of anxiety; the garden allows patients to stroll safely and to satisfy the compulsive wandering that is typical of a phase of Alzheimer's disease [11].

Non-pharmacological interventions have gained increasing attention in recent years as an alternative first-line approach to treat behavioral and psychological symptoms in dementia [12,13]. Sensory gardens and horticultural activities are increasingly used in dementia care, yet their benefits are uncertain. These types of nonpharmacological interventions may improve well-being and reduce the occurrence of disruptive behavior, eventually positively acting on neuroimmune

modulation as we have previously demonstrated [14-16]. Additionally, the use of psychotropic drugs, incidents of serious falls, sleep and sleep pattern also seem to lower. The garden is a place of peace and nature. It draws on all our senses and makes us move our body. It is also an innovative therapeutic tool which can boost the wellbeing of frail or disabled elderly people, as the experience of a nursing home described in this article demonstrates.

## Architectural design

The garden of the Balerna diurnal therapeutic centre is designed following specific architectural strategies [17-26] and is composed of two areas with different functions and appearances: the system of ramps and the ring circuit. The system of ramps and landings connecting the building and the garden. Their slope is always less than 6%, allowing disabled people to walk on them, even if unaccompanied. The ramps run parallel to a pre-existing wall. The total length of the wood-paved path

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is 95 metres. The third ramp of the path is marked, in its highest pick, by a sequence of 14 wooden tables, which compose a hanging garden of aromatic herbs (such as lavender, thyme, sage, mint, and rosemary). The edge of the table can be used as handrail, while the tables allow even wheelchair bound patients to come closer to the garden, and stimulate the senses of touch and smell. At the end of this ramp, patients can pause on a long bench, one side of which looks towards the underlying garden, and the other towards the aviary, located under the landing of the previous ramp. The ramps' parapets are metal frames with a metal protection net bearing a natural oxidised finishing. At every change in the direction of the ramps a different theme is developed, and the path is partitioned into differently decorated relaxing points. Two areas have been paved with stone: one is shady, paved with ancient granite sheets and furnished with a table and two stone benches; the other, on whose top stands a bronze sculpture named "The Profile of Time" and signed Salvador Dalí, is paved with coloured cement conferring it a terra-looking appearance.

At the lowest level of the garden stood an ancient iron pergola which has been kept and restored. The ring circuit of the sensory garden is a 1.50 metres wide route. Its greater axe measures 32.7 metres, the smaller one 8 metres, while the path is 67 metres long. Along the circuit, different clearly recognizable interest points stand out: a small place paved with wood with two benches and a fountain carved in an ancient block of Arzo marble, under which a round-shaped wood bench has been built, the pergola with different kind of climbers on it, flowerbeds full of flowers in different colours, blooming at different times of the year. The mulch around the ring circuit is made of grey gravel, so that the path, paved with artificial red stone, is clearly visible

by means of chromatic opposition. The vegetation demarcates the paths and the relaxing points, and divides the garden from the external space. The different plants used in the garden are not prickly, sharp or toxic, because often patients tend to taste everything they find around them. The garden enclosure, intertwined with vegetation, is covered by jasmine (*Jasminum*) to give the illusion of being in an open space. Water is an important presence: patients may drink or touch it in the specifically designed fountain, and it also produces a pleasant and relaxing sound falling into the basin [27-30]. (Figures 1-4)

### Study design

This was a pre-post quasi-experimental study conducted over a six-month period between March and August 2016. The primary objective was to determine the impact of diffused scents on the frequency of behavioral issues, such as restlessness/wandering, agitation, anger, and anxiety. Secondary objectives included comparisons of age cohorts, gender, and individual behavior frequencies.

Third aim was also to observe how subjects react to peculiar features: ramps, a sculpture and a stone water fountain, frequency of falls and urge to urinate.

Inclusion criteria consisted of patients over the age of 65 with a clinical diagnosis of dementia and enrolled in the Pro Senectute day care center in Balerna, Switzerland. Pro Senectute is semi-public non-profit institution that provides elder care services, outpatient, and community based setting with its primary focus on living independently. The day care program is a center dedicated to assist elderly patients who are able to live at home but require monitoring during daytime hours. Patients

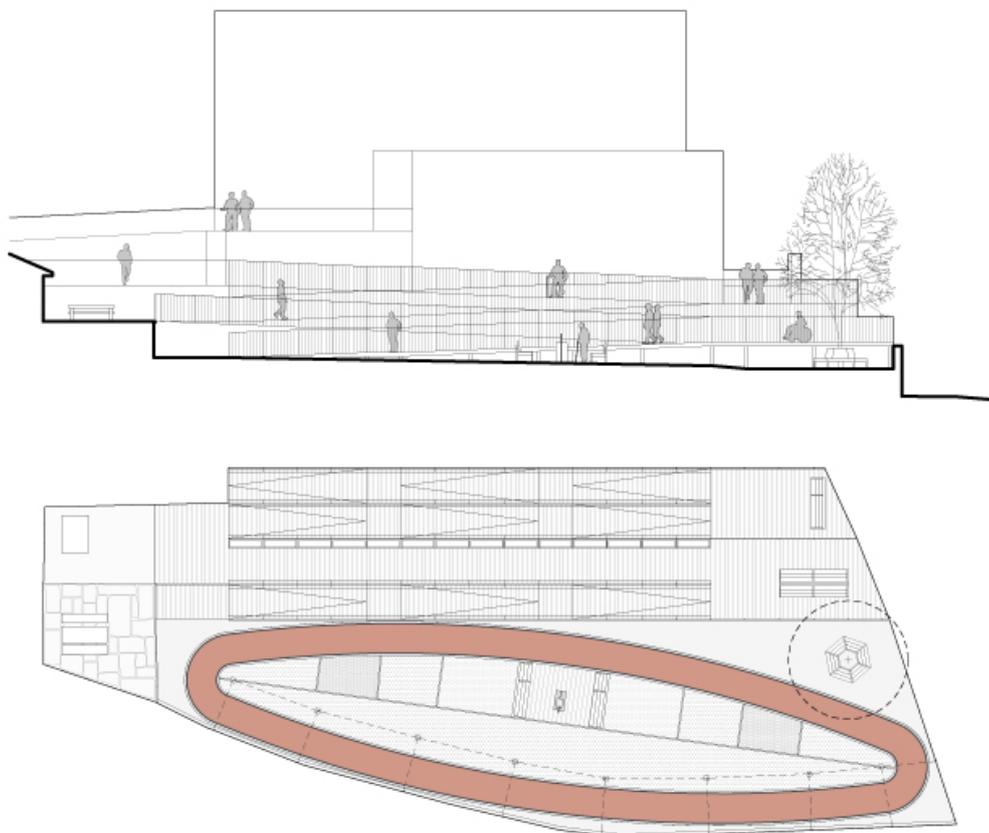


Figure 1. Front view and plan (© Enrico Sassi Architect).



Figure 2. General view (© Photo Marcelo Villada).



Figure 3. Ramps and hanging garden of aromatic herbs (© Photo Marcelo Villada).



Figure 4. Marble fountain (© Photo Marcelo Villada).

enrolled in this program must also be able to take all medications prior to attending the daycare program or after. Patients that were not enrolled in the day care program were excluded from this study.

All subjects were diagnosed with Senile Dementia of the Alzheimer's Type (SDAT) according to established criteria [31]. All subjects had moderate (middle-stage) disease ([http://www.alz.org/alzheimers\\_disease\\_stages\\_of\\_alzheimers.asp](http://www.alz.org/alzheimers_disease_stages_of_alzheimers.asp)).

All family caregivers were administered the Caregiver Burden Assessment (CBA) [32] before their next of kin approached the garden. After three months experiencing the garden, all caregivers were administered a shorter version of the same questionnaire. This includes questions referring to basic emotions evaluated in the first question cluster of the CBA. Subjects were informally assessed with a short 5-item questionnaire regarding specially designed features like a Dali sculpture representing a huge thorn clock, a water fountain and wooden ramps to assess how people with dementia react to art and design. Positive outcomes are hindered in caregivers' rating scales [33]. We had no other choice than use our own positive outcome questionnaire, although unvalidated. Other well defined or validated tolls could not be used.

Mean values were compared using Mann-Whitney U test and correlations were tested using Spearman's rho. Proportions were compared using chi-squared test or Fischer exact test as the group was small. Data were processed and analyzed using STATA (Statacorp LLC, College Station, TX, USA).

## Results

All subjects except one, a 73-years old man, felt calmer and relaxed after attending the garden for 90 days. Eleven subjects enjoyed the scents and fresh air. Twelve people, including the four men, enjoyed the most walking the ramps, which are "the way back home". Nobody payed any attention to the sculpture as a piece of contemporary art but as "a broken clock" that raised a lot of conversation. Ten subjects enjoyed the fountain and flowing water. All 15 drank the water, no urinary incontinence because of flowing water was observed. None of the wanderers fell down in the garden as well as negotiating the ramps. T1 interview scores show that family caregivers experienced less stress of caring when their beloved wandered the garden. On the other hand, garden wanderers showed a reduced need for antipsychotic and sleep medications. (Illustrations: Table 1 and 2).

## Conclusions

Dementia is a devastating disorder that impairs memory, thinking and behavior, which leads, ultimately, to death. The impact of the disease on individuals, families and our health care system makes dementia one of the greatest medical, social and fiscal challenges for the 21st century. Herbal remedies and alternative dietary supplements have been suggested as an effective treatment. Claims about the safety and effectiveness of these products lack scientific proof. Concerns about these alternative strategies include lack of knowledge and assurance about safety, purity, side effects and potential interactions with prescribed medications [13].

This was an observational study: we could not interfere with the center's standard timing and activities. According to the center's rules, it would also be an unsurmountable ethical issue to divide the participants into high and low user groups, or even add a non-user group as done before [3]. All residents add the same opportunity to wander the garden at their will. Moreover, nobody experienced any fall during our period of observation.

**Table 1.** Subjects data (male, female); caregivers scores at beginning (T0) and after 3 months (T1).

	Subjects		Caregiver Burden Assessment	Mini-Caregiver Burden Scale (t0)	Mini-Caregiver Burden Scale (t1)
	(Age)	(Sex)			
1	80	M	20	40	12
2	87	F	16	40	16
3	83	F	12	28	16
4	69	M	20	32	14
5	87	F	16	28	12
6	82	F	18	38	10
7	73	M	20	38	14
8	75	F	10	34	8
9	72	M	10	38	10
10	81	F	14	26	12
11	85	F	16	24	12
12	70	F	18	48	16
13	85	F	18	46	18
14	76	F	20	42	20
15	72	F	12	40	20

**Table 2.** Subjects scores at semi-structured interview.

Subjects PROFIT BY ...	Relax	Scents and fresh air	Walking the ramps	Sculpture as a piece of art	Fountain and flowing water	Drink the fountain's water	Incontinence because of flowing water
Male	3	3	4	0	4	4	0
Female	11	8	8	0	6	11	0

Subjects: 4 males; 11 Females.

The garden is demonstrating how to counterbalance aggressiveness and anxiety. It seems to fully satisfy one's wandering more on the ramps than on the base circuit while sensory stimulation is a priority. This kind of sensitive stimulation can be viewed as a psychosocial intervention that can be delivered by non-fully specialist healthcare workers and volunteers. It is sustainable, adaptable to other settings across high income to low income countries.

Specific architectural design and public health programs promoting such activity should be encouraged to avoid both excess of psychotropic medicines and improving socialization and mental stimulation. Although their effects do not deliver a definitive cure to improve cognition in people with dementia, qualitative and quantitative pre and post findings, indicate that an environmental change such as a therapeutic garden can improve the lives of people with dementia, and their formal and informal caregivers.

Eventually, a dementia sensory and wander garden is not only for demented elderly people. A safe outdoor environment is less threatening of any health center indoor hallway. Anybody, such as somebody undergoing restorative post-stroke therapy, will be less conscious about manifesting their deficits, falling and being viewed as handicapped. In many physical and mental rehabilitation plans, finding a treatment environment and modality that motivates an individual to participate is a primary goal to success. A sensory garden may help people to achieve this goal.

### Technical data

Architecture: Enrico Sassi, architect

Collaborators: Irene Lucca, Roberta Blasi

Works direction: Enrico Sassi

Promoter: Rotary Club Mendrisiotto

Customer: Pro Senectute Ticino and Moesano

Enterprise of construction: Camponovo SA, Mendrisio

Construction of the garden: Olimpio Vidal, Morbio Inferiore

Wood constructions: Eco 2000, Riva San Vitale

Metal constructions: Carlo Nessi, Morbio Inferiore

Professional centre of the green, Mezzana:

Mauro Poli, instructor professional knowledge; Renato Farenga instructor

Photographer: Marcelo Villada

Vegetation: donation JardinSusse Ticino

Marble: donation Patriziato di Arzo

Sculpture: donation Fonderia d'Arte Perseo, Medrisio

Total Squared metres: 530

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