

Garden Therapy in Spinal Cord Injury.

Introduction

An important component of a patient's rehabilitation following a spinal cord or acquired brain injury, should be provided by garden therapy, which has been recorded for thousands of years throughout the world. Its scope and benefits have been maximised throughout the 20th century and primarily in the last couple of decades. With a very wide patient base, many clinical studies assessed the outcomes of garden therapy; these include improvements in cognitive, social, physical and emotional abilities, fine motor skills, upper body strength, range of motion, physical activity tolerance, better posture, sitting and standing balance, enhanced memory and cognition, as well as improved pain management.

Gardening can be offered in the acute phase of injury/disease, when patients cannot use a wheelchair, in which case their beds could be wheeled around in the safe environment of an adjoining garden. This trip may be the first contact with the outside world, after days or weeks of acute treatment. At a later stage in their treatment journey, patients would go to the garden in their wheelchairs.

A good example of a recent garden therapy is that provided by the Duke of Cornwall Spinal Treatment Centre at Salisbury in what is known as Horatio's Garden. This specially created garden allows patients to engage in cultivating plants and flowers, and enjoy the benefit of an outdoors environment. However, the Horatio's Garden may not be accessible in winter or summer to patients, like those suffering from cervical cord or high thoracic injuries who have lost the ability to regulate the temperature of their body. They are thus deprived of an important aspect of rehabilitation, unlike their peers who do not have this medical condition.

Principles of Rehabilitation

Rehabilitation deals with the consequences of impairment of function, which then leads to disability. It is a complex medical and social experience. The objectives of rehabilitation medicine include: prevention of the loss of function, slowing the rate of loss of function, improvement or restoration of function, compensation for lost function, and maintenance of current function.¹ The scope is wide-ranging as specialists in rehabilitation would intervene in the acute (immediately after the onset of injury or disease) and post-acute stages of care.

With regards to Spinal Cord Injury (SCI), there are traumatic and non-traumatic cases. The patients' injuries can be "complete" or "incomplete" (depending on how much preserved function and/or sensation persists beyond the injured level), they may experience spasticity, sensory changes (no, decreased or increased feeling), pain (musculoskeletal or neuropathic "nerve") and are exposed to lots of potential complications, both early and late in the care process. Patients' mood may be low, as they experience a sudden and unexpected paralysis.

The rehabilitation process for a SCI patient involves multi-disciplinary teams, covering skin, bladder and bowels-management, joints (range of movement), spasticity, prevention of deep vein thrombosis (DVT), respiratory complications, and maintenance of muscular

power. The therapists may work on cardio-vascular training and sensory retraining, and patients would receive psychological support and counselling as well. In addition, Consultants in Spinal Injuries and Rehabilitation Medicine liaise with Orthopaedic Surgeons to discuss orthopaedic management (fractures or dislocations) and/or with physicians, oncologists, radiologists for tumours or vascular issues (AVM or infarct).

The first few weeks following an acute episode will be spent in bed or within the confines of the spinal centre, as fractures heal and acute medical complications are dealt with. Patients then learn to be comfortable in a wheelchair, how to transfer or be hoisted into a wheelchair (depending on their level of dependency). Once they have acquired a reasonable degree of mobility and comfort, patients start engaging in numerous activities, like participating in local trips to town, attending the cinema or theatre, engaging in sports as well as gardening. For the latter, such activities typically occur in gardens that have been especially adapted for wheelchair access, with wide, non-slip, smooth surfaces and adapted flower beds and potting sheds.

Brief History of Horticultural Therapy

The first recorded use of gardening for pleasure and relaxation dates as far back as 2000 BC Mesopotamia: the vast arid landscape was dotted with lush agricultural plots, particularly in the fertile areas along the Tigris and Euphrates rivers.² The practice grew more elaborate around 500 BC, when “the Persians began creating gardens to please all of the senses simultaneously by combining beauty, fragrance, music (water) and cooling temperatures in the garden.”³ An early instance of therapeutic gardening was recorded around the 1100s in St. Bernard’s description of a hospice garden at a French monastery with such therapeutic advantages as privacy, green plants, birdsong and fragrance.⁴

An early 19th century book published in America by a professor of medicine and clinical practice of psychiatry asserted that pursuit of gardening activities was what differentiated male patients who recovered from mania from those who did not.⁵ Throughout the 19th century, the inclusion of gardening activities in both public and private hospitals became widespread in the United States: the Philadelphia Friends Asylum for the Insane is a good example of the long-standing tradition of garden therapy.⁶ In the 1850s, medical staff in several Australian hospitals with adjacent farms observed that patients who suffered from stress often recovered more quickly when they worked with plants and farm soil.⁷

The exigencies of the numerous 20th century wars have fuelled research and development in many scientific fields. Similarly, the enormous number of mentally and physically wounded war veterans created a demand for a systematic approach to long-term care and rehabilitation. In the 1940s and 1950s, elements of nature and physical activity began to complement the clinical endeavour to rehabilitate patients with various disabilities, including SCI. In England, for example, the therapeutic value of gardening was taught using hospital gardens: this way, relevant stakeholder could find out about “the adaptation of gardening tools and how a good garden design should be accessible to people with disabilities.”⁸

Garden Therapy Today

In the last decade, there has been a surge in interest in garden activities for treatment purposes. Today, garden therapy is employed to help patients with a wide range of physical and cognitive impairments: spinal cord and brain injury patients, the elderly, cancer patients, people with neurological impairments, Alzheimer's and dementia patients, alcohol recovery clients, disabled children and many other patient groups.⁹

The clinical outcomes that so far have been associated with garden therapy include improvements in cognitive, social, physical and emotional abilities: fine motor skills, upper body strength, range of motion, physical activity tolerance, better posture, sitting and standing balance, enhanced memory and cognition, as well as improved pain management.¹⁰

More precisely, clinical studies documented such physical benefits as improved immune response¹¹, decrease in stress and heart rate¹², improved fine and gross motor skills, as well as better eye-hand coordination¹³. With regards to cognitive benefits, numerous studies recorded improvements in cognitive functioning¹⁴, concentration¹⁵, memory¹⁶, goal achievement¹⁷, and attention capacity¹⁸.

A Swedish study examined the potential of gardening to mediate health, well-being and function among patients suffering from neurological or musculoskeletal conditions. The study, conducted at Dandryd Rehabilitation Clinic in Sweden, acknowledged the clinical benefits of healing gardens: "patients with severe brain damage and decreased awareness were presumed to receive sensory stimulation via responses to different plant material, [whereas] butterflies and insects would trigger eyes to follow them."¹⁹ Furthermore, activities such as planning a flowerbed, calculating the depth and distance between plants, or reading instructions on the seed packages addressed issues with attention, spatial, verbal, numerical and memory skills. Equally noteworthy is the gardening contribution to enhanced mobility, muscle strength and balance, bilateral and eye-hand motor coordination and the range of motion.²⁰

The authors also made a few recommendations about the optimal garden design. They suggest that "It should be designed with a plentiful variety of plant materials that flower in different seasons, attract birds and butterflies, with [reflecting] pools, sculptures and other designs [that are] unambiguously positive."²¹ Moreover, the layout of the garden should facilitate visibility, and provide security, a sense of familiarity and physical comfort.²²

A survey of Australian physical rehabilitation programmes that have incorporated garden therapy explained that typically healing gardens have raised garden beds, non-slippery walking surfaces, wide pathways for easy access, heated glasshouses, indoor/outdoor potting sheds, and wheelchair accessible facilities.²³ Moreover, a gardening therapist is available to ensure that patients make the most of such gardens by organising workshops and tailoring gardening programmes to specific patient needs (i.e. rehabilitation for those who have suffered spinal cord and traumatic brain injury, gardening for older people with intellectual disabilities, children with special needs, etc).²⁴ This systematic approach to garden rehabilitation in Australia is acknowledged and sustained through the introduction of horticultural therapy in university curricula.

In China, garden therapy has been used predominantly to address psychiatric illnesses. A randomised controlled trial in Hong Kong showed that the experimental group experienced significantly lower levels of anxiety, depression and stress when compared with the

control group.²⁵ These conclusions are consistent with previous trials that found garden therapy to be an effective stress management tool.

A study conducted in Kerala, India focused on the benefits of gardening for the elderly. It concluded that garden therapy is valuable because the range of activities “can easily be adjusted and adapted to meet the needs of any specific population without altering the main objectives of the programme.”²⁶

In the United Kingdom garden therapy is generally accepted as an invaluable complement to long-term clinical rehabilitation. Several established rehabilitation centres provide gardening activities for their patients, and organisations such as Thrive seek to expand gardening programmes for people with disabilities throughout the UK.

Most notably, gardening rehabilitation has been used extensively at Headley Court, which is a Ministry of Defence Rehabilitation Centre. In a newly refurbished greenhouse and allotment area, patients with complex poly-traumatic injuries can work to overcome various physical and mental challenges, including working at different heights, standing on varying slopes and surfaces, lifting and moving various items.²⁷ Consistent with previous studies, troops at Headley Court agree that being outdoors relieves them of stress, improves their concentration ability and assists them as they try to deal with their problems and concerns.²⁸

Horatio’s Garden

Horatio’s Garden is located at the Duke of Cornwall Spinal Treatment Centre in Salisbury. The garden has been named after Horatio Chapple, a 17-year old student who sadly killed by a polar bear on 5th August 2011. He had worked as a volunteer at the Spinal Centre: he wanted to be a doctor like his father, David, an Orthopaedic and Spinal Surgeon, now Clinical Director of the Duke of Cornwall Spinal Treatment Centre.

Horatio had interviewed patients and staff and came up with the idea of creating a garden adjacent to the spinal centre. When Horatio died, his friends and family started fundraising for the garden in his name and all of a sudden the project gathered momentum and a lovely garden was set up, to the joy of patients and staff of the spinal centre in Salisbury.

Designed by award-winning gardener, Cleve West, today the garden is a thriving place where volunteers are involved in many activities: helping to look after the garden, accompanying “dependent” patients into the garden and providing tea and homemade cakes for patients and their friends and relatives.

All year round there are different activities like garden therapy, meditation, aromatherapy, music concerts, fruit and vegetable fairs as well as lectures on horticulture given by numerous specialists. To further develop Horatio’s Garden the hope is to build a glazed garden room so that patients with cervical or high thoracic injuries who cannot regulate the temperature of their bodies can enjoy the garden and the activities no matter what the weather.

Horatio’s Garden is now a new charity dedicated to creating beautiful gardens in spinal centres in the UK : www.horatiosgarden.org.uk

Conclusion and Fundraising Appeal

The physical and psychological benefits of garden therapy are well documented in the US, Europe, Australia and several countries in Asia. There is a convincing record of the use of rehabilitation gardening in the UK as well, particularly at Headley Court. Clinical outcomes include enhanced fine motor skills, upper body strength, range of motion, physical activity tolerance, better posture, sitting and standing balance, enhanced memory and cognition, as well as improved pain management.

Horatio's Garden has already delivered many of these benefits to patients at The Duke of Cornwall Spinal Treatment Centre at Salisbury. However, the Garden needs a dedicated space for tetraplegic patients, which will cost approximately £50,000. The fundraising efforts include different initiatives. One of these is the 4-day cycle event undertaken by two 16 years-old boys (Jasen Soopramanien and Freddy Van Randwyck) during their school half-term (October 24th, 2013 to October 27th, 2013). Jasen attended the same school as Horatio.

Many of you are familiar with the devastating effects of a spinal cord or brain injury, and the excellence of centres like the Duke of Cornwall Spinal Treatment Centre. We therefore encourage you to help with the rehabilitation process and donate funds to the Horatio's Garden Charity in order to contribute to Horatio's mission of enhancing the quality of life of people with spinal cord injury by bringing joy, relaxation and peace. to support this project please go to mydonate.bt.com/fundraisers/jasensoopramanien1 or visit www.horatiogarden.org.uk

¹ WHO and The World Bank. World Report on Disability. P. 97

² Geoffrey Jellicoe and Susan Jellicoe. The Landscape of Man: Shaping the Environment from Prehistory to the Present Day. Third Edition. 1995

³ American Horticultural Therapy Association. Definitions and Positions. 2012. Retrieved on August 20th from <http://ahta.org/sites/default/files/DefinitionsandPositions.pdf>

⁴ Nancy Gerlach-Spriggs, Richard Kaufman & Sam Bass Warner, 1998. Restorative Gardens - The Healing Landscape.

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- ⁵ American Horticultural Therapy Association. Definitions and Positions. 2012. Retrieved on August 20th from <http://ahta.org/sites/default/files/DefinitionsandPositions.pdf>
- ⁶ American Horticultural Therapy Association. Definitions and Positions. 2012. Retrieved on August 20th from <http://ahta.org/sites/default/files/DefinitionsandPositions.pdf>
- ⁷ David E. Aldous. Perspectives on Horticultural Therapy in Australia. *Hortechology*. January-March 2000 10 (1).
- ⁸ Söderback, Ingrid, Söderström, Marianne and Schäländer, Elisabeth , 'Horticultural therapy: the 'healing garden'and gardening in rehabilitation measures at Danderyd hospital rehabilitation clinic, Sweden', *Developmental Neurorehabilitation*, 7:4, 245 - 260
- ⁹ Rebecca Haller, Bruce Hendee, Angela Milewski. HCD09 Roundtable Discussion: Creating Outdoor Environments for Healing. November 3rd, 2009. Retrieved on August 20th, 2013 from <http://www.nccdp.org/resources/HCD09.pdf>
- ¹⁰ Rebecca Haller, Bruce Hendee, Angela Milewski. HCD09 Roundtable Discussion: Creating Outdoor Environments for Healing. November 3rd, 2009. Retrieved on August 20th, 2013 from <http://www.nccdp.org/resources/HCD09.pdf>
- ¹¹ Hartig, T., Mang, M., & Evans, G. W. (1991). Restorative effects of natural environment experiences. *Environment and Behavior*, 23, 3-26. AND Rodiek, S. (2002). Influence of an outdoor garden on mood and stress in older persons.
- ¹² Wichrowski, Whiteson, Haas, Mola & Rey, 2005. Effects of horticultural therapy on mood and heart rate in patients participating in an inpatient cardiopulmonary rehabilitation program. *J Cardiopulmonary Rehabilitation*. 2005 Sep-Oct;25(5):270-4
- ¹³ Moore, B. (1989). *Growing with gardening: A twelve-month guide for therapy, recreation, and education* (pp. 3-10). Chapel Hill: University of North Carolina Press.
- ¹⁴ Kaplan, R. & Kaplan, S. (1989). *The experience of nature*. New York: Cambridge University Press.; Cimprich, B. (1993). Development of an intervention to restore attention to cancer patients. *Cancer Nursing* 12(4), 22-27.; Herzog, T., Black, A., Fountaine, K., Knotts, D. (1997). Reflection and attentional recovery as distinct benefits of restorative environments. *Journal of Environmental Psychology* 17(2) 165-170.
- ¹⁵ Wells, N.M. (2000). At home with nature: Effects of "greenness" on children's cognitive functioning. *Environment and Behavior* 32:775-795.; Taylor, A.F., Kuo, F.E. & Sullivan, W.C. (2001). Coping with ADD: The surprising connection to green play settings. *Environment and Behavior* 33:54-77.
- ¹⁶ Namazi, K.H. & Haynes, S.R. (1994). Sensory stimuli reminiscence for patients with Alzheimer's disease: Relevance and implications. *Clinical Gerontology* 14(4), 29-45.
- ¹⁷ Willets, H.C., & Sperling, A. (1983). *The role of the therapeutic recreationist in assisting the oncology patient to cope*. New York: Futura.
- ¹⁸ Hartig, T., Mang, M. & Evans, G.W. (1991). Restorative effects of natural environment experiences. *Environment and Behavior* 23(1), 3-26.; Ulrich, R.S., Simons, R.F., Losito, B.D., Fiorito, E., Miles, M.A.,& Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology* 11: 201-230.; Ulrich, R.S. & Parsons, R. (1992). Influences of passive experiences with plants on individual well-being and health. In D. Relf (Ed.),

The role of horticulture in human well-being and social development (pp.93-105). Portland, OR: Timber Press.; Ulrich, R.S. (1999). Effects of gardens on health outcomes: Theory and research. In C. Cooper Marcus & M. Barnes (Eds.), *Healing gardens: Therapeutic benefits and design recommendations* (pp.27-86). New York: Wiley.; Taylor, A.F., Kuo, F.E. & Sullivan, W.C. (2001). Coping with ADD: The surprising connection to green play settings. *Environment and Behavior* 33:54-77.

¹⁹ Söderback, Ingrid, Söderström, Marianne and Schäländer, Elisabeth , 'Horticultural therapy: the 'healing garden'and gardening in rehabilitation measures at Danderyd hospital rehabilitation clinic, Sweden', *Developmental Neurorehabilitation*, 7:4, 245 - 260

²⁰ Söderback, Ingrid, Söderström, Marianne and Schäländer, Elisabeth , 'Horticultural therapy: the 'healing garden'and gardening in rehabilitation measures at Danderyd hospital rehabilitation clinic, Sweden', *Developmental Neurorehabilitation*, 7:4, 245 - 260

²¹ Söderback, Ingrid, Söderström, Marianne and Schäländer, Elisabeth , 'Horticultural therapy: the 'healing garden'and gardening in rehabilitation measures at Danderyd hospital rehabilitation clinic, Sweden', *Developmental Neurorehabilitation*, 7:4, 245 - 260

²² Söderback, Ingrid, Söderström, Marianne and Schäländer, Elisabeth , 'Horticultural therapy: the 'healing garden'and gardening in rehabilitation measures at Danderyd hospital rehabilitation clinic, Sweden', *Developmental Neurorehabilitation*, 7:4, 245 - 260

²³ David E. Aldous. Perspectives on Horticultural Therapy in Australia. *Hortechology*. January-March 2000 10 (1).

²⁴ David E. Aldous. Perspectives on Horticultural Therapy in Australia. *Hortechology*. January-March 2000 10 (1).

²⁵ Michael C Y Kam and Andrew MH Siu. Evaluation of a Horticultural Activity Programme for Persons with Psychiatric Illness. *Honk Kong Journal of Occupational Therapy*. 2010;20(2):80-86

²⁶ Sreejith A and S Binukumar. *Influence of Gardening and Green Environment on the Subjective Well-Being of the Elderly: A study that focuses on the therapeutic aspects of horticulture*. Study carried out for The Garden City Group, Inc. Agriculture Development Corporation.

²⁷ Queen Elizabeth Foundation for Disabled People. Growing Strong at Headley Court. Retrieved on August 20th, 2013 from <http://qef.org.uk/latest-news/growing-stronger-at-headley-court/>

²⁸ Queen Elizabeth Foundation for Disabled People. Growing Strong at Headley Court. Retrieved on August 20th, 2013 from <http://qef.org.uk/latest-news/growing-stronger-at-headley-court/>