

Healing Gardens in Hospitals

Clare Cooper Marcus is Professor Emeritus in the Departments of Architecture and Landscape Architecture at the University of California, Berkeley. This essay is issued with the generous permission of the author and NAI Publishers <http://www.naipublishers.nl/architecture.html>

For a patient, visitor, or member of staff, spending long hours in a hospital can be a stressful experience. Nearby access to natural landscape or a garden can enhance people's ability to deal with stress and thus potentially improve health outcomes.

In past centuries, green nature, sunlight and fresh air were seen as essential components of healing in settings ranging from medieval monastic infirmaries; to large municipal hospitals of the 17th and 18th centuries; to pavilion-style hospitals, asylums and sanatoria of the 19th and early 20th centuries inspired by the work of public health reformer, Florence Nightingale.

From approximately 1950 to 1990, the therapeutic value of access to nature all but disappeared from hospitals in most western countries. High-rise hospitals built in the International Style resembled corporate office buildings; air conditioning replaced natural ventilation; outdoor terraces and balconies disappeared; nature succumbed to cars and parking lots; and indoor settings designed for efficiency were often institutional and stressful for patients, visitors, and staff. (Ulrich, 1992; Malkin, 1992; Horsborough, 1995).

The early 1990s, however, saw a reversal of this trend in the U.S., triggered by a movement entitled Patient Centered Care. Hospital administrators became aware of negative reactions to the prevailing institutional environments. Competition between hospitals fuelled a greater consideration

for patient needs. There was a slow shift away from the International Style to buildings designed in regional context; to interiors that were welcoming and comfortable; to icons that were familiar (the shopping mall, the home).

Significant research in the 1980s and 1990s brought support to what one might intuitively believe to be so: that views to, or time in, nature have positive influences on health outcomes. (Ulrich 1981, 1984, 1992; Hartig 1991, 1993, 1996). Consumer surveys of former hospital patients differing by age, location and medical problem, found their most widely shared preference regarding the physical environment of healthcare was for access to nature — gardens, views, balconies, indoor plants and nature pictures. (MacRae, 1997). Two studies which asked people where they chose to go when they were feeling stressed or upset found that the majority chose to go outdoors to a natural or designed setting. (Francis, C. and C. Cooper Marcus, 1991 and 1992).

The first systematic Post Occupancy Evaluation study of hospital gardens in the U.S. took place in 1994 when four gardens in the San Francisco Bay Area were studied by means of visual analysis, behavior mapping, and user-interviews. (Cooper Marcus and Barnes, 1995). People appreciated traditional garden elements such as lawns, trees, flowers, and water features; ninety percent of garden users experienced a positive change of mood after time spent outdoors. Responses suggested that gardens were important because they represented a complete contrast to the experience of being inside a hospital: domestic versus institutional scale; natural versus man-made; rich, sensory experience versus limited sensory detail; varied, organic shapes versus predominance of straight lines; places to be alone versus few places of privacy; fresh air versus controlled air; evoking links to the wider world of nature and the ongoing cycle of life versus evoking thoughts of anxiety, illness, and death.

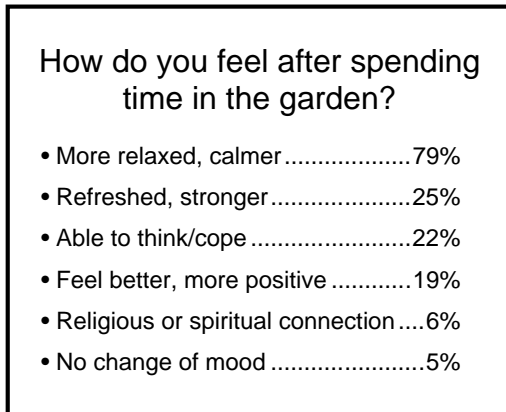
Typical responses from garden-users included:

“My level of stress goes way down... I return to work refreshed.”

“I sit in the garden before my appointment. It helps me deal with what they will put me through.”

“I work in the Intensive Care Unit which is like a hell hole...Sitting here in the sun is like therapy for me.”

“I work underground in the Radiation Department like one of the Mole People. If I didn't have this garden to come to...sunlight, fresh air, birdsong trees...I think I'd go crazy.”



Responses from 143 garden users at four San Francisco Bay Area hospitals (Cooper Marcus, C. and M. Barnes, 1995).

Other Post Occupancy Evaluations conducted around this time included one at a Children's Hospital in San Diego (Whitehouse, S. et al., 2001); one at a psychiatric facility in Canada (Perkins, N., in Chapter 6, Cooper Marcus, C. and M. Barnes, 1999) and one comparing two small community

hospital gardens in Wales (Singleton, D., 1994). While none of these could prove that being in a garden facilitates healing, where the question was asked: “Do you feel any different after spending time in the garden?” ninety-five percent of respondents reported a positive change of mood. One can reasonably assume that change to a more relaxed and calmer frame of mind is likely to enhance the immune system and thus the body has a better chance of healing itself.

By the late 1990s, three books had been published in English on outdoor space in nursing homes and hospitals (Cooper Marcus, C. and M. Barnes, 1999; Gerlach-Spriggs, N., R. Kaufman, and S.B. Warner, 1998; Tyson, M., 1998); and several books were published on how to transform a garden at home into a healing space (for example, McDowell, C.F. and T. Clark-McDowell, 1998; Mintner, S., 1993). Patients and staff in hospitals were beginning to lobby for the creation of usable outdoor space (for example, St. Vincent’s Hospital Cancer Center, Santa Fe, New Mexico; Good Samaritan Hospital, Portland, Oregon); the American Society of Landscape Architects (ASLA) began to sponsor special sessions on healing gardens at its annual conference. In 2003 the School of the Chicago Botanic Garden initiated the first U.S. post-graduate course on Healthcare Garden Design, training landscape architects who want to specialize in this field.

The Healing Garden: Essential Design Elements and Environmental Qualities

It is important to recognize that “healing” is not synonymous with “cure.” A garden cannot mend a broken leg or cure cancer, but it can do the following:

- Facilitate stress reduction which helps the body reach a more balanced state
- Help a patient summon up their own inner healing resources

- Help a patient come to terms with an incurable medical condition
- Provide a setting where staff can conduct physical therapy, horticultural therapy, etc. with patients
- Provide staff with a needed retreat from the stress of work
- Provide a relaxed setting for patient-visitor interaction away from the hospital interior.

Other terms used to describe such a garden are therapeutic, restorative, rehabilitative.

It is also important to remember that activities in healthcare outdoor space can range all the way from completely passive to very active, for example:

Potential activities in a healing garden range from passive to active

- Viewing garden through window
- Sitting outside
- Dozing/napping/meditation/prayer
- Gentle rehabilitation exercises
- Walking to preferred spot
- Eating/reading/doing paper work outside
- Taking a stroll
- Child playing in garden
- Raised bed gardening
- Vigorous walking
- Sports

To start to build a set of design guidelines for hospital outdoor space, one must begin with Roger Ulrich's Theory of Supportive Garden Design. (See Ulrich, R., Chapter 2, Cooper Marcus, C. and M. Barnes, 1999). In brief, this framework is based on the premise that gardens help to mitigate stress to the extent that they:

- create opportunities for physical movement and exercise
- provide opportunities to make choices, seek privacy and experience a sense of control
- provide settings which encourage people to gather together and experience social support
- provide access to nature and other positive distractions

In addition to these four basic guidelines, this author's observation of more than one hundred hospital gardens in four countries (US, UK, Canada, Australia) suggests the need for consideration of the following, if the garden is to be used and reach its full potential:

- visibility
- accessibility
- familiarity
- quiet
- comfort
- unambiguously positive art

1. Opportunities for movement and exercise

Exercise is associated with a variety of physical and psychological (i.e., stress-reduction)

benefits, including improved cardio-vascular health, and reduced levels of depression among adults and children. (Brannon and Feist, 1997; Koniak-Griffin, 1994). The implications for healthcare garden design include looped pathway systems offering a choice of shorter and longer routes; settings which facilitate physical therapists to work outside with recovering stroke patients; settings where well children can run and let off steam; places for contemplative walking (i.e., a labyrinth); walking or jogging routes for staff on a break; corridors with views out to nature to encourage post-surgery exercise.

2. Opportunities to make choices, seek privacy, and experience a sense of control

On becoming a hospital patient, many experience a loss of control. It is often the institution which decides what you wear, what you eat, when the doctor visits, etc. Stress stemming from lack of control has been shown to have negative effects on immune system functioning and other physiological measures among patients (Ulrich, 1999, p. 58), and decreased job satisfaction and increased turnover among staff. Interviews with garden users suggest that regaining control and thus reducing stress is one of the major motivations for garden use. (Cooper Marcus and Barnes, 1995). Going outside is a means of escape. A patient reported: “It’s a good escape from what they put me through. I come out here between appointments... I feel much calmer, less stressed.” (Ibid., p. 27).

For a garden to foster stress reduction by facilitating a sense of control, users must know it exists, be able to gain access, and use it in the ways they prefer. Above all, the garden design must offer choice — places to be alone or with others; places to sit in the sun or shade, with an expansive or close-in view; fixed and moveable seating; different walking routes — all subtly reinforce a sense of autonomy.

3. Settings which encourage people to gather together and experience social support

Research indicates that people with higher levels of social support are usually less stressed and have better health than those who are more isolated, and that higher levels of social support improves recovery or survival rates for various medical conditions. (Ulrich, 1999, pp. 42-5). Hence, there is a marked trend towards longer visiting hours, social-support groups, and more attractive waiting areas in hospitals.

The implications for gardens are to locate them close to patient rooms, waiting areas, and hospital entrances; to provide sub-spaces so that small groups can find privacy; to provide moveable garden furniture; and to provide some areas with outdoor tables and chairs so that a family or staff group can have an informal meal together. A study of four California hospital gardens found that staff were the largest users of outdoor space.

4. Engagement with nature

Nature attracts our attention without depleting the body of energy. A healing garden can have the effect of awakening the senses, calming the mind, reducing stress, and assisting a person to marshal their own inner healing resources.

For a garden to provide maximum therapeutic benefits, it needs to have a plentiful supply of plant materials, some with distinctive seasonal changes; leaves or grass which move with the slightest breeze; subtleties of color, texture, and leaf shape especially where frail people may move slowly looking down or where people may sit for long periods in one setting. Plants may also be experienced unconsciously as metaphors. Trees can provide metaphors of solidity, strength and

permanence; perennials of persistence and renewal; annuals of growth, budding, blooming, seeding, decay, death and transformation.

A healing garden should also provide views to the sky and changing cloud formations; pools that reflect the sky or trees and that can attract wildlife, reminding those in ill-health that life goes on; elements that feature the sight and sound of moving water; and where possible, views to the horizon or to “borrowed” landscape.

The layout of the garden should be such that walking or being pushed in a wheelchair through the garden provides a variety of open and closed views, experiences of differing sub-spaces, even elements of positive surprise or whimsy.

Our connection with nature in a garden can also be cognitive. The Healing Garden at Good Samaritan Hospital, Portland, Oregon, provides plant labels which often engage people’s interest and form triggers for conversation between patients and their visitors. (Cooper Marcus, C., 2003).

Architects and landscape architects need to work closely together to ensure that, as much as possible, there are views out to gardens on the natural landscape from patient rooms, waiting areas, staff offices, and corridors. Views out can also assist in way-finding thus reducing the stress of finding one’s way around a strange building.

Where there is no space on site for a garden or where the climate precludes the use of the outdoors for much of the year, indoor gardens have been successful in providing access to natural elements within a hospital building.

5. Visibility

In field observations at over one hundred acute care hospitals, only three included signs to

an available garden, courtyard, or roof garden in their way-finding system. People have to know a garden is there! Ideally, an outdoor space should be available at the building entrance, or visible from the main foyer so that signage is not necessary.

6. Accessibility

People of all ages and abilities need to be able to enter and move around in the garden. Paths must be wide enough for two wheelchairs to pass (minimum of six feet); they should be smooth and wide enough for a patient on a bed or gurney to be wheeled into the garden; paving joints should be narrow enough so as not to catch a cane, the wheels of a walker or an IV-pole.

In many hospitals visited, doors to outdoor spaces were kept locked to reduce use and maintenance costs, or because staff were not close enough to monitor use. Accessibility can be enhanced by ensuring that nursing stations have good visual access to gardens used by children, or by frail or infirm patients; and that staff understand the therapeutic value of access to the outdoors.

7. Familiarity

When feeling stressed, many seek environments that are familiar and comforting. A depressed person may be reluctant to leave their bed; an anxious person may seek the familiarity of home. Similarly, those in medical settings who are stressed from overwork, illness, or anxiety need to have access to garden settings which are soothing in their familiarity. This could mean an aesthetic which is rooted in the culture of the majority of patients, spaces which are human- or domestic-scaled; plants and furnishings that are familiar. These recommendations are especially important in hospices for the terminally ill and facilities for people with Alzheimer's disease.

8. Quiet

If a garden is to have therapeutic value in a medical setting, it needs to be quiet — a complete contrast to the public announcements, TVs, and rattling trolleys of a hospital interior. People using the garden need to feel a sense of calm, and to be able to hear birdsong, wind chimes, or the sounds of a fountain. A study of four hospital gardens found that users were disturbed by incongruent mechanical sounds such as air conditioners and street traffic. (Cooper Marcus and Barnes, 1995). At the planning stage, it is essential that future garden spaces are located way from traffic, parking areas, delivery driveways, and helicopter landing pads.

9. Comfort

Hospital patients often feel vulnerable. Patients who are elderly, infirm or mobility-impaired need the reassurance of handrails, seating at frequent intervals (especially near the entry door), and paving materials that do not cause excessive glare. Patients, staff and visitors also need to feel psychologically secure: a garden space needs to feel and be safe, with some sense of enclosure and the absence of feeling that users are in a “fishbowl,” being stared at. The degree of comfort in a garden should be such that — if they wish — an ambulatory patient or staff on a break could comfortably close their eyes or lie down in the sunshine for a nap. Some patients may be on medications which require that they keep out of the sun; others may fear they will get chilled sitting outdoors; some may have trouble getting up from a seated position. At the very least, a garden needs to provide for physiological comfort with choices of places to sit in the sun or the shade; seating that is protected from breezes by planting or structures; and bench seating which would allow someone to sprawl or lie down, as well as garden seats with arms and backs.

With the banning of smoking in most healthcare facilities, gardens and other outdoor areas are being sought out by smokers. To avoid problems associated with second-hand smoke, smokers need to be accommodated on a patio or other space separate from the garden used by non-smokers.

10. Unambiguously positive art

There is a human tendency when stressed to project onto nearby objects and people some of the anxiety and discomfort experienced inside. Niedenthal et al. (1994) have developed the concept of “emotional congruence” — when a person is presented with an array of environmental stimuli, those parts that match the emotional state of the viewer will most likely be the focus of attention. Thus, abstract art that is seen as interesting or challenging by a non-stressed person may be perceived as frightening or threatening by someone in a state of anxiety. (Ulrich, 1999, pp. 67-71). Hence in a setting such as a hospital, known to elevate symptoms of stress, it is essential that art, sculpture and other human-made design elements be unambiguously positive in their message. Complex abstract art which may be appropriately challenging in a museum or corporate foyer is not appropriate in a hospital. Research indicates that patients prefer familiar representational nature or landscape themes and that patients recovering from heart surgery exposed to landscape photographs of water and trees had lower anxiety and required fewer doses of strong pain killers than those in control groups with no pictures. (Ulrich, et al., 1993). A classic case of the “wrong” kind of art occurred in a US hospital where abstract figures of birds in a courtyard were viewed with dislike and fear by cancer patients in adjacent wards, and eventually had to be removed. (Ulrich, 1999, pp. 70-71).

Precedents drawn upon by designers of contemporary healing gardens

Designers of healthcare gardens draw upon a number of different precedents to inform their work. Some are successful, others less so. Few, so far, are evidence-based, yet many do seem to provide successful therapeutic landscapes.

1. Archetypal spaces
2. Metaphors
3. Historical precedents
4. Domestic precedents
5. Regional attributes
6. Statement art
7. Medical diagnoses

1. The client and designer of the Therapeutic Garden of the Institute for Child and Adolescent Development, Wellesley, Massachusetts, USA used the approach of creating archetypal spaces such as a hill, cave, ravine, thicket, stream, bridge. The garden was created for the psychiatric treatment of children who have experienced severe trauma. A recent book by the Director of the Institute entitled “Child Therapy in the Great Outdoors” documents how children project their fears and joys onto elements in the garden and are thus able to work through a healing process. (Santostefano, S., 2004). Sad to say, due to the retirement of its director, this remarkable facility and its garden are now closed.

2. A garden at Good Samaritan Hospital, Phoenix, Arizona, USA uses a metaphor of the Cycle

of Life as a major theme in its design. A water course begins in a low fountain-pool, symbolizing birth; it flows along a rocky course through the garden, symbolizing the passage of life; and ends in a quiet, contemplative pool — the end of life. While few users may consciously recognize the metaphoric base of the garden design, the fact that there is a variety of still and moving water that can be watched, heard and touched, as well as plentiful plant material and many choices of places to sit, creates a well-used therapeutic milieu. (See case study in Cooper Marcus, C. and M. Barnes, 1999, pp. 181-186.)

3. Designers of gardens and buildings often draw upon historical precedents. In the case of healing gardens, some are more appropriate than others; some are good approaches for certain populations but not for others.

The building-enclosed courtyard is an appropriate model as long as it is large enough — and adjacent buildings low enough — that it receives sufficient sunlight, and as long as the privacy of adjacent rooms is not intruded upon by people in the courtyard, or vice versa. The advantage of this model in a hospital is that it is an enclosed, protected space; it is clearly hospital territory and inpatients may feel comfortable sitting outside in hospital gowns. Some of the disadvantages are that often the peripheral landscaping is poorly done (or totally forgotten) so that people avoid using the courtyard as it is like sitting in a fish bowl. In addition, HVAC units are often placed in courtyards intruding on the quiet that people seek in healthcare gardens.

The English Strolling Garden with lawns, flowers, trees and winding paths is a particularly suitable historical model since it incorporates all four of the elements of Roger Ulrich's Theory of Supportive Garden Design — exercise, choice, social support, and nature distraction — and is a form familiar in many Western cultures. It is particularly appropriate in acute care hospitals and

hospice facilities, enabling staff, visitors and ambulatory patients to “escape” to an environment in complete contrast to the building interior. Some good examples include the AIDS Memorial Grove in Golden Gate Park, San Francisco, California, USA; Houston Hospice, Houston, Texas, USA; The Comfort Garden, San Francisco General Hospital, San Francisco, California, USA. (See case study in Cooper Marcus, C. and M. Barnes, 1999, pp. 176-181.)

One of the oldest historical examples of healing garden design — the medieval monastic cloister garden — has not, to the knowledge of this author, been used as a model in contemporary healthcare garden design.* It would be a particularly appropriate model in a chronic-care or geriatric facility, with the roofed cloister forming a secure environment in which to sit, walk and view the garden.

4. **Domestic Precedents.** Two forms of domestic precedent have been used successfully in designing outdoor space in facilities for older people. In facilities where residents may be infirm but are neither physically or mentally ill, a front porch or front garden is particularly appropriate. Residents in nursing homes or senior apartments are not so much stressed as they are bored. Sitting in a front-of-the-building location they can watch neighborhood activities, look out for a visitor or the mailman, while socializing with fellow residents.

The outdoor space in a residential facility or day center for those with Alzheimer’s disease or other dementias must be modeled on an enclosed back garden since such residents have a tendency to “wander.” The enclosure of the garden (fence or wall) should be disguised by shrubs and trees so that residents are not conscious of being “fenced in.” The back garden is also very appropriate as a

* If a reader knows of a contemporary example, please get in touch with the author at clare@mygarden.com.

model for a hospice where visitors and patients seek privacy and solitude in a setting which is domestic and familiar.

5. **Regional attributes.** It is commonplace for a designer of a building to draw upon regional or neighborhood context so that a new structure fits into its setting. It is not so clear whether a hospital garden, similarly, has to draw on regional context. A roof garden at Harrison Memorial Hospital in Bremerton, Washington, USA echoes the rocks and sparse vegetation of the shores of nearby Puget Sound. A garden at San Diego Children's Hospital echoes the colors and forms of a California beach scene. Might the patients at both these facilities have preferred green, lush environments? We don't know. Patients and visitors using the garden of the Houston Hospice appreciate the green, colorful, shady setting even though it has little in common with the natural landscape of this part of Texas. Clearly there is much that still needs to be researched.

6. **Statement Art.** While they are students, designers are often encouraged to create innovative forms, breaking with former precedents. This goal is further encouraged in the professional world where design magazines and awards tend to reward unique artistic statements that no one has ever attempted before. This approach is not in and of itself "wrong" and may be entirely appropriate in the design of, say, a new museum, concert hall, or memorial. But when this model is applied to a healing garden, the results so far have been markedly unsuccessful in meeting the guidelines suggested above. For example, an artist commissioned to design three hospital courtyards at the West Dorset County Hospital, Dorchester, UK installed parallel rough stone walls that arc up out of the ground and then disappear. The spaces have none of the attributes of a healing environment, something recognized by the hospital staff who, in the years since construction, have brought in flowers in pots and garden furniture to try and humanize these bleak spaces. Tilting slabs of

travertine leaning rather ominously over a bleak, formal courtyard at the Cancer Clinic of Alta Bates Hospital (Herrick campus) in Berkeley, California, USA do not create an environment for solace and repose.

The above examples were created by an artist and an architect, respectively, pointing to the importance of employing landscape architects who are trained to design gardens and other outdoor spaces, and who have professional knowledge of plant materials. Such examples (which are not unique) also remind us that when the term “healing” is used in the context of hospital gardens, it obligates the designer to subordinate his or her aesthetic taste to the objective of creating user-focused, supportive environments.

7. **Medical diagnoses.** An exciting trend in hospital garden design is the provision of outdoor spaces created specifically for the medical needs of patients and their caregivers. Gardens are becoming the location of, and means of treatment for, certain patient groups.

(1) **Rehabilitation Gardens.** The Healing Garden at Good Samaritan Hospital, Portland, Oregon, USA was designed with input from physical therapists, speech pathologists, and horticultural therapists who work with patients who have had strokes or suffered brain damage. Varied surfaces and slopes provide an arena for learning to walk again; varied planter edge heights for sitting and leaning; a variety of labeled plants for color and shape recognition, reading, etc. (Cooper Marcus, C., 2003).

At the Rusk Institute of Rehabilitative Medicine in New York City a play-garden for children with brain injuries and mobility problems was designed with input from hospital staff, patients, families and neighbors. With a range of topography, surfaces and features to manipulate, the garden encourages physical activity, interaction with the natural world, the re-use of limbs, and taking risks.

Activities which otherwise would have taken place in an equipped rehabilitation room now take place outdoors with children hardly aware that they are “exercising.”

The Burn Center Garden at Legacy Emanuel Hospital, Portland, Oregon, USA is a unique facility for patients and their families. Paths are wide enough for beds to be wheeled outside; grade changes allow patients to practice walking; different textures to re-experience touch. Shade is an essential element since it is painful for burn patients to experience direct sunlight.

The Serenity Garden at Scripps Memorial Hospital, San Diego, California, USA was designed for a different kind of rehabilitation. Here patients enrolled in a drug and alcohol rehabilitation program can use a mostly hardscape garden based on the 12 Steps Alcoholics Anonymous model. A labyrinth in the center of the space is circled by twelve sub-spaces, each with vegetation, a water or sculptural element, and inspiring words inscribed on a paving stone intended to generate self-reflection.

(2) Gardens for patients with Alzheimer’s disease and other forms of dementia. More is known about Alzheimer’s, its effect on cognition, and appropriate design responses than any other disease. (See Zeisel, J. and M. Tyson, Chapter 9 in Cooper Marcus, C. and M. Barnes, 1999.) Among features appropriate in a garden are a simple, looped pathway system with a single exit/entry door to the building to help those who are spatially disoriented; features and plants that may evoke childhood memories since long-term memory is less impaired than the events of today or yesterday; and non-toxic plant materials since at a late stage in the disease, people tend to put everything into their mouths. Also important in such a garden, as indeed for all outdoor environments serving the elderly are a trellis or porch at the entry to allow a gradual transition from indoor to outdoor light levels; tinted concrete pathways to reduce glare (a problem for aging eyes); and low, intricate planting to

engage the interest of a stooped, slow-moving person. (For case studies of excellent Alzheimer's garden designs see Cooper Marcus, C. 2005; Zeisel, J. and M. Tyson, Chapter 9 in Cooper Marcus, C. and M. Barnes, 1999.)

(3) Gardens for patients with HIV/AIDS. The Joel Schapner Memorial Garden at Cardinal Cook Hospital, New York City is a fine example of a formerly useless space — a bleak rooftop on a high rise building — transformed by a sensitive designer (Landscape Architect David Kemp) into an attractive green and colorful oasis for patients and staff. Special attention was paid to differing levels of shade since patients on certain medications must not be in the direct sun; and to the provision of planting containers for use in a horticultural therapy program. This space, formerly shunned because of the negative association with AIDS, is now used by staff from all over the hospital and for fund-raising events, while a leaf pattern featured on tiles in the garden has become the hospital's logo. When the garden recently had to be reconstructed because of a leaking roof, current patients — now stronger and living longer because of new drugs — asked for a space for weight-lifting in the garden and a stage for karaoke singing.

(4) Gardens for cancer patients. Due to the cancer rates in many Western countries, cancer clinics with adjacent gardens are becoming more and more common. A particularly successful example is one at Mount Zion/University of California San Francisco Medical Center, where a formerly bleak concrete courtyard was transformed into a healing garden by a breast cancer patient (who was also an artist), along with a garden designer, and input from other patients. The garden incorporates walking paths, the soothing sounds of water, engaging plant materials, places to sit alone or with others and plenty of shade since patients on certain chemotherapy drugs must stay out of the sun. Once the garden was completed, cancer patients and their families attended workshops where they

inscribed their stories on tiles which now decorate the corridor overlooking the garden. (See Cooper Marcus, C., 2001.)

A small, unpublished pilot study by this author with former and current cancer patients revealed that their wishes for a healing garden (greenery, soothing sounds, shade, places of privacy, etc.), and their concerns that certain elements not be present (intruding noise; too many hard surfaces; steel, concrete or plastic elements, etc.) were no different from the preferences of hospital patients in general — with one exception. Patients on chemotherapy often feel nauseous when exposed to strong smells. This suggests avoiding flowers with strong scents, and ensuring cooking smells from a nearby cafeteria or restaurant do not drift into the garden.

Conclusions

There are many advantages to a hospital investing in a garden, which — in relation to the total cost of building and equipping a new facility — is a very small amount.

Advantages to healthcare facilities

(Roger Ulrich, 1999)

Probably advantages:

- Reduction of stress in patients, staff and visitors (very likely)
- Reduced pain in patients (likely)
- Reduction in depression (likely, especially if garden fosters exercise)
- Higher reported quality of life for chronic and terminally-ill, patients (likely, especially if garden fosters exercise)

- Improved way-finding (very likely, especially if garden in prominent location)

Potential advantages:

- Reduced costs: Length of stay shorter for certain patient categories; fewer strong pain medication doses
- Increased patient mobility and independence
- Higher patient satisfaction
- Increased staff job satisfaction

Not only are there advantages for the patients, but also for staff — working in stressful jobs, under difficult conditions. With staff hiring and retention an increasing problem in many Western countries, improving the work environment, including providing outdoor space for breaks, can be an important investment.

Architects often “think big” via computer-drawn models and outdoor spaces are sometimes seen as what separates buildings or what’s “left over.” It is essential that a landscape architect be on the design team from the beginning to guide site planning so that outdoor spaces are in appropriate locations regarding access, micro-climate, etc.

Before the design of a garden reaches the schematic phase, it is essential that the design team consult with medical staff likely to use the garden for outdoor therapy, and with potential patient-users. Ideally, the team should annotate the final plan with presumed health benefits so that a later post-occupation evaluation study can be conducted to see if the garden functioned as expected. Research results should be disseminated to peers, and information on garden benefits should be disseminated to all current and future staff in a given facility so that they can encourage patients and

families to make use of the garden.

Though we are becoming more informed regarding the benefits of healing gardens and their essential design elements, there are still many unanswered questions.

- Do people seeking calm and peace in a hospital garden prefer winding paths and an “organic” layout, or a symmetrical design with straight paths so they can see their destination?
- Does it depend on the type of facility, the age of users, type of patient, the culture?
- Do people find solace and peace in a Zen garden, or a paradise garden if they don’t understand its symbolism, or come from the culture of origin (Japan, Persia)?
- Do cancer patients find comfort in a garden where the plants are those from which their chemotherapy drugs are derived, or would they rather not be reminded when they come outdoors to a healing place?
- Do psychiatric patients, heart patients, and other patient-populations derive particular benefits from healing gardens, and should designs differ for each group?
- Do indoor and outdoor gardens facilitate similar stress-reduction benefits?
- Do outpatients derive benefits from waiting for appointments in garden spaces?
- How does a garden impact staff health and job satisfaction?
- Do different garden elements or forms help alleviate different stress-related states (anxiety, fear, depression, burnout, boredom)?

The healing garden is both a process and a place. It is a concept at the meeting point of medicine and design. Some of the problems involved in the provision and retention of such gardens

stem from the fact that the medical profession thinks in terms of the internal process of healing but barely recognizes the potential impact of the physical environment; while designers are familiar with manipulating the elements of place, but sometimes overlook how these impact mood and behavior. Clearly, continuing dialog and joint research between these professionals is called for.

While more research is needed, we cannot wait until every possible study is completed. The evidence we do have warrants continuing efforts to establish healing gardens in healthcare settings so that users may benefit and researchers have more real-life settings in which to assess their effects. Like the medical profession, designers must become familiar with what is known up to this point, do their best to remain true to these findings, and embrace the vow: “First do no harm.”

REFERENCES

- Brannon, L. and J. Feist. (1997). *Health Psychology*, 3rd ed. Pacific Grove, CA: Brooks/Cole.
- Cooper Marcus, C. (2001). "Hospital Oasis." *Landscape Architecture*, October, pp. 36-41, 99.
- Cooper Marcus, C. (2003). "Healing Havens." *Landscape Architecture*, August, pp. 84-88, 104-109.
- Cooper Marcus, C. (2005). "No Ordinary Garden." *Landscape Architecture*, March, pp. 26-39.
- Cooper Marcus, C. and M. Barnes. (1995). *Gardens in Health Care Facilities: Uses, Therapeutic Benefits, and Design Considerations*. Martinez, CA: The Center of Health Design.
- Cooper Marcus, C. and M. Barnes (Eds.). (1999). *Healing Gardens: Therapeutic Benefits and Design Recommendations*. New York: John Wiley & Sons.
- Cooper Marcus, C. and C. Francis (Eds.). (1998, second edition). *People Places: Design Guidelines for Urban Open Space*. New York: Wiley.
- Francis, C. and C. Cooper Marcus. (1991). "Places People Take Their Problems." In J. Urbina-Sotia, P. Ortega-Andeane, and R. Bechtel (Eds.), *Proceedings of the 22nd Annual Conference of the Environmental Design Research Association*. Oklahoma City: Environmental Design Research Association, pp. 178-184.
- Francis, C. and C. Cooper Marcus. (1992). "Restorative Places: Environment and Emotional Well-Being." In *Proceedings of 24th Annual Environmental Design Research Association Conference*. Boulder, CO; EDRA.
- Gerlach-Spriggs, N., R. Kaufman, and S. B. Warner. (1998). *Restorative Gardens: The Healing Landscape*. New Haven, CT: Yale University Press.

Hartig, T. (1993). "Nature Experience in Transactional Perspective." *Landscape and Urban Planning* Vol. 25, pp. 17-36

Hartig, T., A. Bök, J. Garvill, T. Olsson, and T. Gärling. (1996). "Environmental Influences on Psychological Restoration." *Scandinavian Journal of Psychology*. Vol. 37, pp. 378-393.

Hartig, T., and G. W. Evans. (1993). "Psychological Foundations of Nature Experience." In T. Gärling and R. G. Golledge (Eds). *Behavior and Environment: Psychological and Geographical Approaches*. Amsterdam: Elsevier/North Holland, pp. 427-457.

Hartig, T., M. Mang, and G. W. Evans. (1991). "Restorative Effects of Natural Environment Experiences." *Environment and Behavior*, Vol. 23, pp. 3-36.

Horsburgh, C. R. (1995). "Healing by Design." *The New England Journal of Medicine*, Vol. 11, No. 333, pp. 735-740.

Koniak-Griffin, D. (1994). "Aerobic Exercise, Psychological Well Being, and Physical Discomforts During Adolescent Pregnancy." *Research in Nursing and Health*, Vol. 17, pp. 253-268.

MacRae, S. (1997). *Consumer Perceptions of the Healthcare Environment: An Investigation to Determine What Matters*. Preliminary report published by The Center for Health Design, Martinez, CA, and The Picker Institute, Cambridge, MA.

Malkin, J. (1992). *Hospital Interior Architecture*. New York: Van Nostrand Reinhold.

McDowell, C.F. and T. Clark-McDowell. (1998). *The Sanctuary Garden*. New York: Simon and Schuster.

Mintner, S. (1993). *The Healing Garden*. London: Headline Book Publishing.

Niedenthal, P. M., M. B. Setterland, and D. E. Jones (1994). "Emotional Organization of Perceptual Memory." In P. M. Niedenthal and S. Kitayama (Eds.), *The Heart's Eye: Emotional Influences in Perception & Attention*. San Diego: Academic Press, pp. 87-113.

Santostefano, S. (2004). *Child Therapy in the Great Outdoors: A Relational View*. Hilldale, NJ: The Analytic Press.

Singleton D. (1994). "Two Community Hospital Gardens: A Therapeutic Assessment." In M. Francis, P. Lindsey, and J.S. Stone (Eds.), *The Healing Dimensions of People-Plant Relations: Proceedings of a Research Symposium*. Davis, CA: Center for Design Research, University of California, Davis, pp. 269-282.

Tyson, M. (1998). *The Healing Landscape: Therapeutic Outdoor Environments*. New York: McGraw-Hill.

Ulrich, R. S. (1981). "Natural versus Urban Scenes: Some Psychophysiological Effects." *Environment and Behavior*, Vol. 13, pp. 523-556.

Ulrich, R. S. (1984). "View Through a Window May Influence Recovery from Surgery." *Science*, Vol. 224, pp. 420-421.

Ulrich, R. S. (1992). "Effects of Interior Design on Wellness: Theory and Recent Scientific Research." *Journal of Healthcare Design*, Vol. 3, pp. 97-109.

Ulrich, R. S. (1999). Chapter 2, "Effects of Gardens on Health Outcomes: Theory and Research." In Cooper Marcus, C. and M. Barnes. *Healing Gardens: Therapeutic Benefits and Design Recommendations*. New York: John Wiley & Sons, pp. 27-86.

Whitehouse, S., et al. (2001). "Evaluating a Children's Hospital Garden Environment: Utilization and Consumer Satisfaction." *Journal of Environmental Psychology*, Vol. 21, pp. 301-314.

Zeisel, J. and M. Tyson. (1999). Chapter 9, "Alzheimer's Treatment Gardens." In Cooper Marcus, C. and M. Barnes. *Healing Gardens: Therapeutic Benefits and Design Recommendations*. New York: John Wiley, pp. 437-504.

Examples of healing gardens (or therapeutic, restorative, or rehabilitative gardens) are nature-oriented spaces that are designed to provide therapeutic or rehabilitative potential (Sanderback et al., 2004; Cooper Marcus, 2007). Examples can be found in hospitals and healthcare facilities from around the world, such as the Khoo Teck Puat Hospital in Singapore, the University Medical Center Brackenridge in Austin, Texas, and the Dell Children's Medical Center in Texas. Building on these findings, attention has turned to investigating specific aspects of natural settings and gardens. The term healing gardens is most often applied to green spaces in hospitals and other healthcare facilities that specifically aim to improve health outcomes. These gardens provide a place of refuge and promote healing in patients, families, and staff. Of course nature can benefit everyone, not just those in hospitals. One fascinating study reported that tenants in Chicago public housing who had trees around their buildings reported knowing more people, having stronger feelings of unity with neighbors, becoming more concerned with helping and supporting each other, and having stronger feelings of belonging than tenants in buildings without trees.