

Clare Cooper Marcus Naomi A. Sachs Foreword by Roger S. Ulrich



Therapeutic Landscapes

An Evidence-Based Approach to Designing
Healing Gardens and Restorative Outdoor Spaces

WILEY

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*An Evidence-Based Approach to Designing
Healing Gardens and Restorative Outdoor Spaces*

CLARE COOPER MARCUS

NAOMI A. SACHS



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Therapeutic Landscapes

Foreword

The publication of this important book could not be more timely, given the great wave of healthcare facility construction and renovation overtaking the United States and other countries. Healthcare environments are changing and responding to trends and challenges as varied as new payment policies that reward quality and satisfaction, the growing importance of ambulatory care and rehabilitation, rising acuity levels of hospital inpatients, and rapid growth in the number of frail elderly and those with Alzheimer's disease or other forms of dementia. The fast-evolving character of healthcare underscores the need to rethink the design of care environments and to create better facilities that prominently include gardens designed in evidence-informed ways to reduce stress, improve satisfaction and clinical outcomes, and enhance sustainability.

The interdisciplinary field of evidence-based design (EBD) has developed over the past twenty-five years in response to the need for sound knowledge to help guide healthcare design that improves care quality, outcomes, and cost-effectiveness. It makes solid sense to use the best available evidence when creating a new, long-lived healthcare environment on which so many will depend. Although the quality and amount of EBD research has rapidly increased, most studies address issues linked to the architecture and interior design of hospitals—the effects of single versus multibed patient rooms on infection transmission, for example. A smaller but growing body of EBD research has examined the influences of gardens and nature views on quality of care and outcomes in healthcare facilities. This book provides an up-to-date account of the research and theory on the effects of nature and excels in extracting and clearly explaining the design implications. Readers will gain a great deal of evidence-informed knowledge and insight concerning what garden design approaches work and which are not effective in improving healthcare quality.

It has been fifteen years since publication of the landmark volume edited by Clare Cooper Marcus and Marni Barnes, *Healing Gardens: Therapeutic Benefits and Design Recommendations*. Compared to that 1999 work, this new book by Marcus and Naomi A. Sachs contains much fresh material, based on recent research, plus a wealth of new knowledge derived from evaluations of several innovative and successful therapeutic gardens created in recent years by landscape architects and healthcare providers. The book

begins by surveying the history of hospital outdoor space, provides a chapter covering research and theory, and follows with chapters on types and locations of therapeutic spaces in healthcare, and general design guidelines relevant across different categories of medical facilities.

Each of the following chapters focuses on a garden category designed for specific patients or user groups: gardens for children's hospitals, for example; for patients with cancer; for persons with Alzheimer's; and for mental and behavioral health facilities. These chapters present case studies of exemplary real-world gardens, accompanied by instructive and interesting insights obtained from postoccupancy assessments giving balanced views concerning strengths and weaknesses of the settings. Each chapter reviews research relevant to the specific user group and discusses design guidelines adjusted to meet their particular therapeutic needs. These chapters are superbly illustrated. A few examples of the many outstanding gardens featured: the Olson Family Garden at St. Louis Children's Hospital, Alnarp Rehabilitation Garden in Sweden, and the internationally renowned Oregon Burn Center Garden at Legacy Emanuel Medical Center in Portland. Additionally, this is the first book on healing gardens with chapters on planting design and maintenance, horticultural therapy, sustainability, gardens for veterans, restorative spaces in public spaces, and the business case for healing gardens, including funding strategies.

A theme running through the book is that a participatory design process is vital to creating a successful therapeutic garden. This critical topic is the focus of a noteworthy chapter by Teresia Hazen, which describes the participatory process developed at Legacy Health in Portland, Oregon, and used to create several successful gardens at Legacy medical centers. The Legacy process begins with the premise that there is no one-size-fits-all garden design adequate to meeting the needs of varied types of patients, their families, and associated clinicians. The Legacy process instead tailors the design of each garden to ensure it directly and effectively serves the therapeutic needs of a particular category of patients (for example, stroke patients, burns cases) and their families and healthcare team.

More than any other previous book, *Therapeutic Landscapes* provides research-grounded yet user-friendly information that will enable readers to successfully design, fund, and build healthcare facilities that provide beneficial

access to nature for patients, visitors, and staff. This book will be an indispensable resource for healthcare designers and horticultural therapists. It will also be of great value for healthcare administrators, facility managers, facility developers, and many therapists and other clinicians. The knowledge

and lessons it offers will be critically important for increasing the quality and success of any healthcare project that provides gardens or other forms of access to nature.

Roger S. Ulrich, PhD, EDAC

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Introduction

Having spent many weeks in the hospital left an indelible imprint on the way I experience pain, suffering, and loss within the recognized healthcare environment. Surely this fear and anxiety that one feels in this controlled and somewhat clinical building can leave one feeling more vulnerable, fragile, and scared. Just by being outside and with nature, to smell and touch the plants, reduced the depression and dread. I think more positive thoughts, am hopeful, and if I cry I feel the plants understand and do not judge or cringe.

Mariane Wheatley-Miller, personal communication, 2013

HOSPITALS AND OTHER HEALTHCARE FACILITIES are some of the most difficult places for people to be. Regardless of the physical setting, they are almost invariably environments where people face a high degree of stress. Patients may be experiencing physical or emotional pain; visitors, in an alien and, for many, a threatening environment, are worried about a loved one or close friend. Healthcare providers, in many cases dealing with life and death on a daily basis, are under an enormous amount of pressure. Their hours are long and their workload is taxing.

Since the mid-1990s there has been an increasing emphasis on a patient-centered approach in healthcare and a growing understanding of the importance of evidence-based design (Cama 2009; Frampton, Gilpin, and Charmel 2003). Hospital interiors have largely changed from the white, clinical settings of decades ago to more colorful—sometimes even hotel-like—environments. Nursing homes, renamed assisted-living facilities, have largely left behind their depressing reputation and are being reborn as warm, homelike settings. The environmental needs of specific patients, such as those with Alzheimer's disease, are increasingly understood. In short, there has been a revolution in the provision of healthcare and the recognition that the physical environment matters to people's health and well-being and that the health and well-being of the whole person needs to be addressed rather than just the disease.

Along with these beneficial changes to healthcare buildings, there has been a growing recognition that the whole environment—including outdoor space—matters (fig. 1.1). A significant body of research confirms and sheds new light on what many people have known intuitively: that

connection with nature is beneficial—even vital—for health. Walking in the woods, sitting on a park bench, tending the soil in one's garden, and even watching the colors and movements of nature from indoors are all passive and active ways to connect with the natural world. They awaken our senses, encourage physical movement and exercise, facilitate social connection, reduce stress and depression, and elicit positive physiological and psychological response. Healthcare facilities—from hospitals to specialized medical settings to assisted-living and retirement communities—are striving to incorporate specially designed outdoor spaces that can support the health and well-being of patients, residents, visitors, and staff (fig. 1.2).

Professional magazines are increasingly mentioning praiseworthy hospitals with healing gardens or views to nature. Excellent books have been published recently that focus specifically on healthcare outdoor space (Rodiek and Schwarz 2006, 2007; Pollock and Marshall 2012). However, it is rare that journals and magazines read by designers review such books or feature articles on healthcare outdoor space. Sadly, excellent books and monographs on healthcare building design often pay scant attention to outdoor spaces. Building plans are depicted with white expanses around them as if they are floating in space.

While the evidence for the importance of access to nature is there—and growing—the actual provision of appropriate outdoor space in healthcare facilities is often less than adequate, with limited “green nature,” unmet needs for privacy and “getting away,” even poor provision of the most basic needs, such as ease of access, comfortable seating, safe walking surfaces, protection from the sun, and so on.



1.1 The trend toward patient-centered care continues to grow. Healthcare facilities such as the Northeast Georgia Medical Center, in Gainesville, incorporate restorative gardens into the master plans from the beginning of the design process. The Wilheit-Keys Peace Garden offers physical access to nature outside of the building and visual access from inside. Designer: The Fockele Garden Company.

Copyright, The Fockele Garden Company

The goal of this book is to focus critical attention on healthcare outdoor space, to emphasize the importance of evidence-based design, to highlight exemplary case studies, and to present research-based guidelines to inform clients and designers of restorative outdoor spaces. The aim is to address two key groups of readers: the clients and funders of healing spaces and the designers (principally landscape architects) who will translate client needs into an actual environment. If clients and funders understand more about the requirements and goals of a healing garden, they can more easily communicate with the designer. If designers understand more about the research on which to base their decisions, they are more likely to meet the goals of their clients—those who provide the funding and the users who will eventually benefit from the garden (fig. 1.3).

With an audience of two quite different sets of “actors,” it is inevitable that some parts of this book will speak more to

one than the other. For example, some sections of the chapter on planting and maintenance may be basic knowledge for an experienced landscape architect but new and useful information for a client. The detailed design guidelines are principally aimed at the practicing designer and may be of less importance to the client or philanthropic donor. Chapters on horticultural therapy and participatory design may provide new information for many readers. The case studies of exemplary gardens throughout document existing best practices and will, the authors hope, inspire anyone using this book.

The core of the book consists of the general design guidelines presented in chapter 6. These are research-informed recommendations that need to be followed in any kind of healthcare outdoor space, whether it is a courtyard or a roof garden, whether it is at an acute-care hospital or a residential



1.2 Walking paths and benches for rest—even for stretching out to take a nap—provide a restorative environment for patients, visitors, and staff. The gardens of McKay Dee Hospital, in Ogden, Utah, are also open to the public and are thus an example of “preventive care” through community-centered design.

Photo by Chris Garcia



1.3 Native plantings at Kent Hospital in Warwick, Rhode Island, create a beautiful entrance. Designer: Wellnesscapes.

Photo courtesy of Thomas Benjamin, Wellnesscapes.com, on behalf of Kent Hospital

facility for the frail elderly. Beyond these basic guidelines, specific guidelines must also be followed for certain patient groups. These are explained in chapters 7 through 14—gardens for ill children, those with cancer, the mentally ill, Alzheimer’s

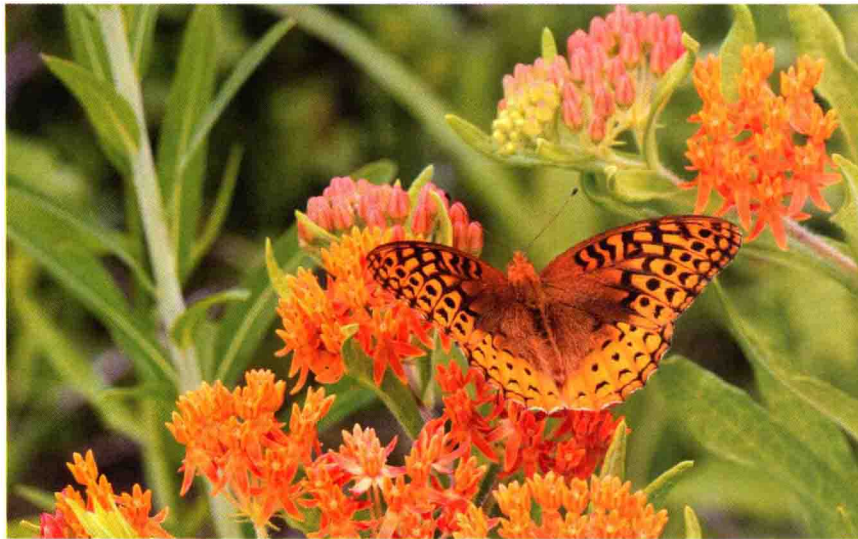
patients, the frail elderly, returning veterans, rehabilitation patients, and those in hospice.

Different terms have emerged to refer to outdoor spaces in healthcare, and two different types can be recognized. A healing, therapeutic, or restorative garden (these terms are used interchangeably in this book) is one that users, whether residents or visitors, experience any way they want: to sit, walk, look, listen, talk, meditate, take a nap, explore. Therapeutic benefits are derived from just being *in* the garden. No staff is necessary, except for maintenance. Such a garden might be found at an inpatient acute-care hospital, a residential facility for the frail elderly, a hospice, or an outpatient clinic.

In an enabling garden, by contrast, activities are led by a professional horticultural therapist (HT), occupational therapist (OT), physical therapist (PT), and other allied professionals in collaboration with other clinical staff. The HT might engage recovering stroke victims in weeding, watering, and repotting plants; the PT or OT might help someone with a broken limb by encouraging reaching, grasping, and exercising. Therapeutic benefits are derived from hands-on activities and exercise in the garden (fig. 1.4). Such a garden



1.4 A veteran transplants seedlings into a larger pot at Gardening Leave in Auchincruive, Scotland.
Courtesy of Gardening Leave Limited



1.5 Great spangled fritillary on butterfly weed.
Photo from www.henrydomke.com.

is likely to be found at a rehabilitation hospital, some mental and behavioral health facilities, and some children's hospitals.

For the purposes of this book, "nature" is defined quite broadly, and while largely referring to vegetation, it also refers to wildlife, water, stone, the weather, sky, clouds, wind, and sun. "Access to nature" includes actual passive and

active, indoor and outdoor engagement with nature through any or all of the senses (fig. 1.5).

Indoor contact with nature can include looking out at nature through a window; viewing nature imagery (still and moving pictures); seeing, touching, and smelling indoor vegetation; and hearing nature's sounds through an open window or through sound recordings (birds, water, and the like).



1.6 The Elizabeth and Nona Evans Restorative Garden at the Cleveland Botanical Garden in Cleveland, Ohio, provides opportunities for passive and active connection with nature. Designer: Dirtworks, PC
Courtesy of Dirtworks, PC; photo by Bruce Buck



1.7 Echinacea flower detail.
Photo from www.henrydomke.com

Outdoor contact with nature is likely to engage more than one of the senses and can range from passive to active: sitting just outside the entry of a building, taking a stroll, stopping to

look at, touch, or smell plant material, engaging in physical or occupational therapy, gardening, watering plants, taking a brisk walk for exercise, jogging, or engaging in team sports (fig. 1.6).

The word “garden” will be used throughout the book to refer to any designed outdoor space with predominant greenery, even though the term has slightly different meanings in different English-speaking countries. For example, in the United Kingdom it refers to the whole of a defined and designed cultivated space that is predominantly green, whereas in the United States it tends to refer to a planting bed, such as a flower garden (fig. 1.7).

“Healthcare facilities” are defined as places where people receive medical care. These include—but are not limited to—inpatient and outpatient facilities, acute-care general hospitals, rehabilitation hospitals, psychiatric hospitals, children’s hospitals, veteran’s hospitals, specialty hospitals and clinics (cancer, kidney dialysis, mental health, etc.), hospice, residential and outpatient facilities for those with special needs (the frail elderly, Alzheimer’s patients, the mentally ill, battered women).

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History of Hospital Outdoor Space

THE HISTORY OF HOSPITALS AND HEALING PLACES goes back many centuries. At one time nature was seen as intrinsic to healing, but this important connection was largely lost by the twentieth century. Now, however, it is being rediscovered, in the form of healing gardens and therapeutic landscapes in healthcare settings.

One of the first healing places for which we have evidence was the Aesclepion at Epidaurus in ancient Greece—one of a network of healing places functioning from the fourth century BCE to the sixth century CE. Natural spring water was used in cleansing rituals; a library, museum, theater, marketplace, and groves of trees provided for people's entertainment as they waited until the auguries were favorable and they could enter the most important building, the *abaton* (Gesler 2003). Here, dream-healing took place, for it was believed that when people were asleep, the soul left the body and could communicate with the gods. Sleeping patients received prescribed cures from the god Asclepius, and when they awoke, his injunctions were administered by physician-priests (*ibid.*).

Among the first hospitals as we know them were Roman military hospitals with naturally lit and cross-ventilated wards separated from each other to avoid cross-infection, although this was long before any understanding of germ theory (Heathcote 2010). Throughout the Middle Ages in Western Europe, monastic hospices and infirmaries cared for pilgrims and others who were sick as part of the Christian obligation to offer charity and show mercy to the poor. A major figure in this era was Hildegard von Bingen, a remarkable twelfth-century German mystic, theologian, and medical practitioner who—along with Hippocrates—did not imagine the body as a machine or disease as a mechanical breakdown. She embraced the concept of greenness, or *viriditas*, gleaned from the practical concerns of gardening. Just as plants put forth leaves, flowers, and fruit, so the human body has the power to grow, give birth, and heal (Sweet 2012).

Monastic settings were the first instances where a garden, usually enclosed by an arcaded cloister, was specifically incorporated as part of a healing environment (fig. 2.1). Bernard of Clairvaux (1090–1153) wrote of the intentions of this space at the hospice at Clairvaux, France: “Within this enclosure many and various trees . . . make a veritable grove which lying next

to the cells of those who are ill, lightens with no little solace the infirmities of the brethren, while it offers to those who are strolling about, a spacious walk. . . . The sick man sits upon the green lawn. . . . He is secure, hidden, shaded from the heat of the day . . . for the comfort of his pain, all kinds of grasses are fragrant in his nostrils. The lovely green of herb and tree nourishes his eyes. . . . The choir of painted birds caresses his ears. . . .” (Gerlach-Spriggs, Kaufman, and Warner 1998, 9). This passage indicates the remarkable intuitive insights of early Christian leaders regarding the significance of sensory awakening in nature as a component of healing, an understanding that was for a long time lost, and only now, almost a thousand years later, is being rediscovered.

As monasticism declined in the fourteenth and fifteenth centuries, care of the sick fell to civic and ecclesiastical authorities. Within the Roman Catholic tradition, one of the primary design requirements of a hospital was the provision of long wards, where the priest celebrating Mass could be seen from every bed. The influential Ospedale Maggiore of Milan (1458), for example, was built in a cruciform plan with windows so high that no one could see the formal gardens outside (Thompson and Golden 1975, 31).

Some hospitals continued the courtyard-garden tradition exemplified in the monastic cloister gardens. The English hospital and prison reformer John Howard (1726–90) reported hospitals in Marseilles, Pisa, Constantinople, Trieste, Vienna, and Florence that had gardens where patients could see through windows and doorways, and where convalescing patients could stroll (Warner 1995, 18) (fig. 2.2).

In England, by the seventeenth century, wealthy merchants and philanthropic nobility were willing their grand homes and grounds to act as hospitals. Soon architects were building hospitals in the style of grand houses, such as Christopher Wren's Royal Chelsea Hospital in London with its spacious lawns and courtyards (Darton 1996, 91). But for most, the hospital was still a refuge of last resort. Birth, sickness, convalescence, and death were mostly experienced at home (*ibid.*, 70).

Among the first set of recommendations for hospital garden design were those written by the German horticultural theorist Christian Cay Lorenz at the end of the eighteenth



2.1 Medieval hospital garden (now part of a hotel), Santiago de Compostela, Spain.

Photo by Clare Cooper Marcus



2.2 Eighteenth-century hospital courtyard (now part of the Danish Museum of Design), Copenhagen, Denmark.

Photo by Clare Cooper Marcus

century: "The garden should be directly connected to the hospital. . . . A view from the window into blooming and happy scenes will invigorate the patient . . . [and] encourages patients to take a walk. . . . The plantings should wind along dry paths, which offer benches. . . . The spaces between could have beautiful lawns and colorful flower beds. . . . Noisy brooks could run through flowery fields. . . . A hospital garden should have everything to enjoy nature and to promote a healthy life" (Warner 1995). These suggestions uncannily foreshadow the findings of researchers in the late-twentieth century who offered credible empirical evidence that viewing or being in nature reduces stress (see chapter 3).

The next major shift in hospital design and the provision of outdoor space was the development of the pavilion hospital. In Western Europe, the seventeenth century saw an emphasis on the systematic collection of data on births and deaths and

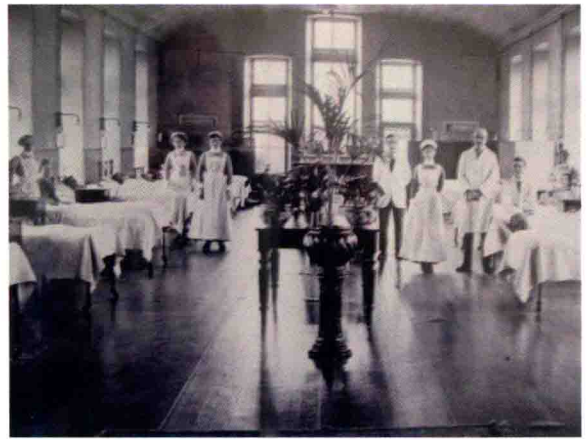
the careful observation of patients in hospitals. New hospital designs paid special attention to hygiene and ventilation, since it was then believed that infections were spread by noxious vapors or miasmas in the air emanating from swamps, stagnant water, and rotting waste. For example, a new hospital in Edinburgh constructed in 1729 was built in a U-shape on a hill to catch the air and sun, and two acres were set aside for a garden (Gerlach-Spriggs, Kaufman, and Warner 1998, 15).

Pavilion-style hospitals comprised two- and three-story buildings linked by a continuous colonnade, and narrow wards with large windows that enhanced ventilation. Between the wards were courtyards and gardens, which began to be reconsidered as important components of the healing environment. Several influential hospitals designed in this style included St. Thomas' Hospital in London, the rebuilt Hôtel Dieu in Paris, and several naval and military hospitals built at the height of Britain's imperial power.

Florence Nightingale, British nurse and public health reformer, enthusiastically endorsed these new hygienic hospital plans, which became the predominant form in the nineteenth and early-twentieth centuries. Having cared for the wounded during the Crimean War (1854–56), Nightingale observed unexpected differences in mortality experienced by soldiers treated in tents and temporary buildings and those treated in conventional hospitals. She proposed that high mortality rates in hospitals could be solved through a combination of design, sanitation, and quality care. At the Scutari military hospital near Constantinople, she succeeded in reducing the death rate from cholera and dysentery from 42 percent to 2 percent through hygiene and careful nursing practice (Darton 1996, 93).

In one of her influential publications she wrote: "Second only to fresh air . . . I should be inclined to rank light in importance for the sick. Direct sunlight, not only daylight, is necessary for speedy recovery, . . . being able to see out of the window instead of looking at a dead wall; the bright colors of flowers, . . . being able to read in bed by the light of the window. . . . It is generally said the effect is upon the mind. Perhaps so, but it is not less so upon the body on that account" (Warner 1995, 24) (fig. 2.3). Her insights marked a significant important return to an understanding that mind and body are intertwined and must be treated as one. With the study of anatomy in the Renaissance, when the dissection of cadavers revealed "no spirit inside the body," that understanding had been discredited.

The rise of Romanticism prompted a reconsideration of the role of nature in bodily and spiritual restoration. Writers such as Rousseau and Goethe extolled the powers of nature



2.3 A typical narrow, well-lit ward of a nineteenth-century pavilion-style hospital.

Photo by Clare Cooper Marcus

to foster contemplation and an emotional connection with spirit. The landed gentry created landscapes that mimicked nature. Cities built parks for the physical and mental health of their residents. It was during this period that there was a dramatic reemergence of nature as part of the restorative environment, particularly in the treatment of the mentally ill.

Rethinking the treatment of the mentally ill began at the hospital at Zaragosa, Spain, founded in 1409. Instead of patients being confined and punished, as was the custom at the time, they followed a simple daily routine of communal meals, household chores, and work in vegetable gardens, vineyards, orchards, and on a farm (Warner 1995, 17). This method of socializing patients became known in the nineteenth century as the "moral treatment," and was enthusiastically endorsed by the reformers Dr. Phillippe Pinel in France and William Tuke in England.

In 1792 William Tuke and the Society of Friends established The Retreat on the outskirts of the English city of York. Here, in a radical new approach to treatment, the mentally ill were treated with gentleness and kindness instead of being chained down and beaten like prisoners. Access to landscaped grounds became part of the treatment; it was believed that the mentally ill could not cope with city environments and could only recover in peaceful natural surroundings. The grounds also protected patients from being perused by the curious and served as a space for gardening and farming.

The philosophy behind these new kinds of hospitals spread to North America. The first such hospital in the United States was the Friends Asylum in Philadelphia founded in 1813. By the 1820s, asylums with natural landscaped grounds had