

**A Bunker Garden:
Mindfulness-Based Landscape Design to Restore Physicians from Burnout**

by Melissa Nicole Philen

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ACADEMIC ABSTRACT

Landscape architects design healing gardens at healthcare facilities to support patients, visitors, caregivers, and staff. Many acknowledge that medical staff regularly visit healing gardens to escape work-related stress (Marcus & Sachs, 2014). Rarely, however, are healing gardens on medical campuses designed specifically to support physicians' well-being. There is a void in healing garden design theory. Reports on the prevalence of physician burnout, warn of a widespread crisis and dismal reality within the medical community (T. D. Shanafelt et al., 2015). Researchers pronounce an urgent need for evidence-based interventions, which address individual contributing factors to burnout (Christina Maslach, Jackson, & Leiter, 1986). By investigating the Mindfulness-Based Stress Reduction program, an evidence-based therapy, clinically proven to cultivate emotional healing, for physicians suffering burnout, this research reveals how a therapeutic garden could meld mindfulness-based practices with environmental theory; healing garden design precedents; and healthcare design typologies. Finally, mindfulness-based landscape design guidelines describe how a private, restorative, healing garden could help maintain physicians' well-being and rehabilitate physicians experiencing burnout due to emotional exhaustion within the workplace.

GENERAL AUDIENCE ABSTRACT

Healing gardens have been proven successful as a therapeutic approach to reduce emotional distress. This thesis argues that therapeutic gardens, designed for medical facilities, are not suitable for physicians struggling with burnout. This research seeks to understand how a private healing garden in a medical setting could help build and maintain physicians' emotional resilience while rehabilitating physicians experiencing burnout. Through an in-depth review of therapeutic garden design theory and mindfulness-based stress reduction (MBSR) therapy, this research highlights the shared values between the two methods used to alleviate emotional distress. Characteristics of physicians' emotional exhaustion, social isolation, and workplace environment are teased out and organized for design intent. Elements of mindfulness-based therapy are related to existing healing garden design programs. Relationships found enhance healing garden design theory and serve as guidelines for Mindfulness-Based Landscape Design specifically for physicians in healthcare settings. Correlations between design and wellness also address the need for landscape architects who contribute to a dynamic, active, and participatory design process.

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INTRODUCTION

“(Burnout) represents an erosion in values, dignity, spirit, and will—an erosion of the human soul.” (Christina Maslach & Leiter, 1997, p. 17)

Healthcare clients and landscape architects conceptualize healing gardens to support patients, visitors, caregivers, and staff. Many acknowledge that medical staff regularly visit healing gardens to escape work-related stress (Marcus & Barnes, 1995; Petros & Georgi, 2011; Roger S. Ulrich et al., 1991). Rarely, however, are healing gardens on medical campuses designed specifically to support physicians’ well-being. Due to mental, social, and environmental constraints, physicians are particularly susceptible to ill-health. Stress, directed attention fatigue, and emotional exhaustion lead to burnout in some. The burnout phenomenon is especially prevalent in physicians.

Reports on the pervasiveness of physicians’ waning work-life satisfaction, or burnout, warn of a widespread crisis and dismal reality within the medical community (Dyrbye et al., 2014; Peckham, 2015; Shanafelt, Boone, et al., 2012; T. D. Shanafelt et al., 2015; Spickard Jr, Gabbe, & Christensen, 2002; Wibel, 2016). The trend exposes an epidemic of struggling physicians, impaired physician-to-patient interactions, and deteriorated, quality medical care (Gold, Sen, & Schwenk, 2013; Grol et al., 1985; Shanafelt, Oreskovich, et al., 2012; West et al., 2006). Physician burnout causes profound repercussions for individuals’ lives, patients’ well-being, and results in a significant financial loss for the healthcare delivery system (Christina Maslach, Schaufeli, & Leiter, 2001; Wallace, Lemaire, & Ghali, 2009). Investigators pronounce an urgent need for

evidence-based interventions, which address individual contributing factors to burnout (Christina Maslach et al., 1986; Oaklander, 2015).

To support physicians, healthcare administrators have increasingly provided training in mindfulness-based cognitive therapies (Santorelli, 2007). These programs have helped build resilience in physicians within the workplace (Zwack & Schweitzer, 2013). Correlations exist between mindfulness interventions, environmental psychology, and design aimed at reducing individuals' stress in healthcare settings. Studies in the fields of psychology, medical education, and medicine have accessed the effectiveness of mindful practices upon physicians suffering with burnout. Studies in landscape architecture, environmental psychology, and medical geography have accessed the effectiveness of nature experiences upon perceived well-being and lower stress levels in individuals. There is a void in healing garden design theory pairing these theoretical and empirical relationships.

This thesis adopts the exploration by reviewing how a healing garden in a medical setting could help build and maintain physicians' emotional resilience while rehabilitating physicians experiencing burnout. It focuses upon the emotional exhaustion component of burnout. First, a review will link garden design to the healing process and healthcare design. Next, this research will examine the course of physician burnout, medical culture, and associated therapies, used to treat the phenomenon. After the examination, a diagnosis will highlight the environmental conditions within the medical culture, which includes mental and social issues. Physicians' and organizations' responsibilities will ensue. The study will recommend a garden space where physicians may practice Mindfulness-Based Stress Reduction (MBSR) to treat burnout. It will dissect the Mindfulness-Based Stress Reduction (MBSR) program. By finding relationships between the MBSR program and environmental psychology, this work sifts out design

implications. Design guidelines will set the foundation for how to conceptualize and program a restorative, therapeutic, healing garden to help support, maintain, and rehabilitate physicians. Finally, Mindfulness-Based Landscape Design principles for a restorative, bunker garden promoting physician wellness will conclude this research.

RESEARCH OBJECTIVES

“Exposure to nature enhances one’s ability to reflect.” (Mayer, Frantz, Bruehlman-Senecal, & Dolliver, 2009, p. 637)

Nature experiences, whether contrived or authentic, reduces stress (Marcus, 2007; Roger S Ulrich, 2002; Whitehouse et al., 2001). Environmental and behavioral psychologists have focused much attention upon the beneficial, stress-reducing affect that nature and healing gardens trigger in healthcare facilities (Roger S Ulrich, 2002). Little research provides design recommendations based upon clinically proven methods used to reduce stress in individuals suffering from emotional exhaustion caused by burnout. Mindfulness-Based Stress Reduction (MBSR) program has been reviewed as a method used to successfully to reduce stress associated with physician burnout (Gazella, 2005; Krasner et al., 2009; Regehr, Glancy, Pitts, & LeBlanc, 2014; Shapiro, Astin, Bishop, & Cordova, 2005; Simpkins & Simpkins, 2012). This investigation’s overarching objective is to determine how a healing garden in a medical setting may draw insight from mindfulness-based therapy to support and restore physicians experiencing burnout.

Physician burnout emerges through a complex, downward interpersonal trend in the workplace that includes organizational provisions and individual responsibilities. It is not realistic to cover all of the phenomenological variables; therefore a single component, emotional exhaustion, will be covered in this thesis (C Maslach & Jackson, 1982). The discussion concentrates on theoretical groundwork describing the emotional, social, and environmental aspects of emotional exhaustion and design interventions seeking to alleviate stress.

By exploring the two treatment strategies, the research rationale attends to a common thread, reducing individuals' perceived levels of stress. Both healing garden design theory and Mindfulness-Based Stress Reduction (MBSR) program seek this shared objective. Cooper defines a focused literature review as method to compare and contrast theories, research outcomes, and potential applications (1988). By relating mindfulness-based interventions and healing garden design guidelines, this research aims to contribute a method of building resilience in physicians through healing garden design. Narrowing focus on developing design interventions using MBSR for physicians holds promise for reducing burnout, increasing physician wellness, and ultimately improving quality of the healthcare delivery system as a service and workplace.

The first objective will be to define common terms used in this document, elaborate on the cultural context in medical settings, and highlight healing garden, design approaches found in medical settings. Secondly, it will summarize the nature of physician burnout as it relates to emotional exhaustion, social isolation, the workplace environment. It will introduce mindfulness-based therapy as a countermeasure to stress. Theoretical and empirical relationships will be discussed according to recommendations designed by Hart, an academic researcher and writer (1998). In conclusion, the relationships will be applied to healing garden design as a set of design principles. Relationships between paradigms and among a variety of specialties such as landscape architecture, environmental psychology, and medicine will examine burnout. Findings will enhance healing garden design theory and serve as guidelines for Mindfulness-Based Landscape Design specifically for physicians in healthcare settings.

HISTORICAL BACKGROUND OF THERAPEUTIC GARDENS

“Leveraging the body’s innate capacity to heal itself may be the key to creating a sustainable health-care system for the 21st century.” (Ruff & Mackenzie, 2009, p. 321)

Establishing Terms in Context

The word “garden” conjures many imaginings: plots of earth toileed upon and cultivated for vital sustenance; romantic expanses of greenery harvested, clipped, and manicured for leisurely delight; wet; dry; or otherwise conceptualized for personal taste, style, purpose, or site. “Garden” developed from an active root form, “gher”, meaning “to grasp, enclose” (“garden,” 2017). Throughout history, gardens have symbolized a paradise in close communion with God. Eden provided sanctuary. Beyond the garden, a quest for homecoming awaited (Genesis 2-3).

This return signifies “restoration”, “a bringing back to a former position” or “to a normal, healthy condition” (“restoration,” 2017). Restoration beholds an ideal homeostasis, a union akin to the relationship between man and God. This thesis assumes that within a restorative landscape, one may have a nature experience that promotes this state. Freedom from needs, desires, ill health, and encounters with depravity exists within this enclosed, green space. This symbolism reveals the nature of a healing garden, which this thesis undertakes.

Restorative, therapeutic, and healing environments embody a significant parallel. Terms such as “restorative”, “therapeutic”, and “healing” describe landscapes associated with medical settings. Environmental psychologists refer to “restorative environments” as the conscious, unconscious, physical, and emotional relationships between people and nature or built forms

(Ittelson, 1974; S. Kaplan, 1987; Lindheim & Syme, 1983; Roger S Ulrich, 1993). Health geographers use the term “therapeutic landscapes” to describe the process of healing held in either a natural or man-made setting such as healthcare facilities (Wilbert M Gesler, 1992; Hartig, Mang, & Evans, 1991). This research subscribes to the evolutionally relationship between nature and people (S. Kaplan, 1987; Roger S Ulrich, 1993; Wilson, 1984). It also advocates to enhance the role nature plays in a healing process within medical settings.

Within the confines of an organized structure, one may seek good health and healing. The term “health” comes from *hal* or “whole” (“health,” 2017). The *World Health Organization* (WHO) defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” (WHO, 2017) This thesis acknowledges the WHO’s definition of health and supplements it by contributing what Doctors Shanafelt, Sloan and Habermann state, “Wellness

goes beyond merely the absence of distress and includes being challenged, thriving, and achieving success in various aspects of personal and professional life.” (2003, p. 514)

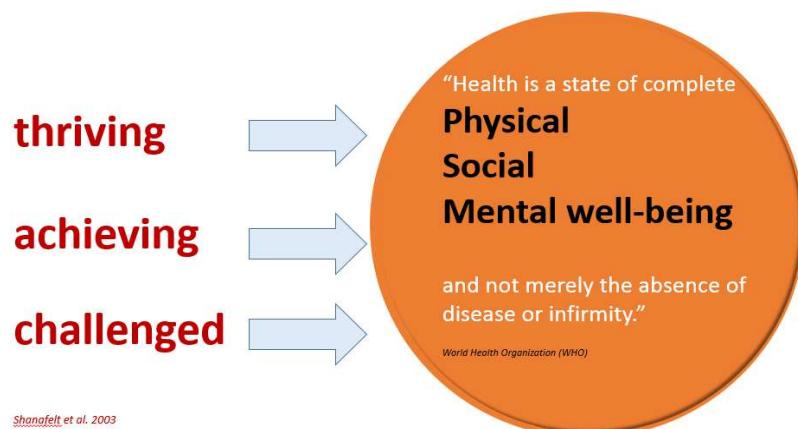


Figure 1: Concept Diagram of Personal and Professional Well-being

Medical facilities provide a service to those seeking to maintain health or suffering from ill-health. The word “hospital” evolved from the Latin, “hospes”, or host. The place where positive feelings tide between the host and guest came to be known as a “hospitium” (Gerlach-Spriggs,

Kaufman, & Warner, 2004). Compassion disperses the positive feeling and becomes elemental in the construct of a hospital (Siegel, Germer, & Olendzki, 2009, p. 19). Medical staff provide a service with compassion. The term compassion stems from two Latin terms: “com”, meaning “with, together”, and “pati”, meaning “to suffer” (“compassion,” 2017). Physicians have the obligation to generate the healing process in a compassionate manner. Patients, caregivers, staff and administration place their faith in physicians to restore well-being by delivering a state of wholeness.

Unlike cultural depictions, however, physicians do not possess a divine ability to make individuals whole (Dawkins, 2016). They are mortals, confined by universal laws, including a 24-hour day; exposed to the environment, both natural and constructed; and vulnerable to wear on their physical and mental being. Since physicians must operate on a higher-order cognitive level, it is reasonable to assume that they are vulnerable to attention fatigue. Chronic demands may wear a physicians’ ability to adapt. Any demand creates stress (Selye, 1956). Stress is the response to events or features that are challenging, demanding, or threatening to well-being (Lazarus & Launier, 1978). Both physical stressors and emotional reactions evoke the stress response, which occurs when the autonomic nervous system releases the stress hormone, cortisol, which increases vigilance (Leather, Pyrgas, Beale, & Lawrence, 1998; Lee & Wilson, 2002). Multiple theories aim to describe the stress processes; yet, only a selected few will support this thesis. How individuals manage stress and define stressors may have different interpretations depending upon worldviews.

Worldviews are a cognitive lens, or socially and mentally constructed frames-of-reference, specific to a culture’s relationship to place; understanding of history; explanation of cosmic laws; and creation of meaning through the lived experience (Bandura, 1986; Cresswell, 2004; Hong & Mallorie, 2004; Kruglanski & Higgins, 2007; Wyer & Srull, 1989). Conceptual worldviews shape

differences in managing health and well-being (Aerts et al., 1994). Philosophical approaches to medicine are categorized within two major paradigms, Eastern or Western traditions (Barsky, 1988). These paradigms evolved and splintered since antiquity; however, both paradigms consider health, stress, the mind-body connection, and the human relationship to the environment.

Aristotle (3rd Century BCE), while pondering the nature of reality and truth, underscored his philosophies with the importance of observation. From this approach, the scientific method developed as a rational, logical, evidence-based means to advance the pursuit of knowledge. Scientific advancements progressed in a linear pattern from questions to observable results. This empirical-based process required investigators to isolate and focus upon a single problem. For healthcare, this method separated the body into a set of rational, functioning systems.

The ancient Greek Physician, Hippocrates (4th Century BCE), conceptualized the observation-based medical model. This premise conceives the body, an obvious, physical manifestation that could be fragmented into a set of biological systems and treated by isolating parts and testing them with a system of linear, logical, and rational inquiry. The body faced empirical research (Engel, 1977). This Biomechanical Model became the method by which

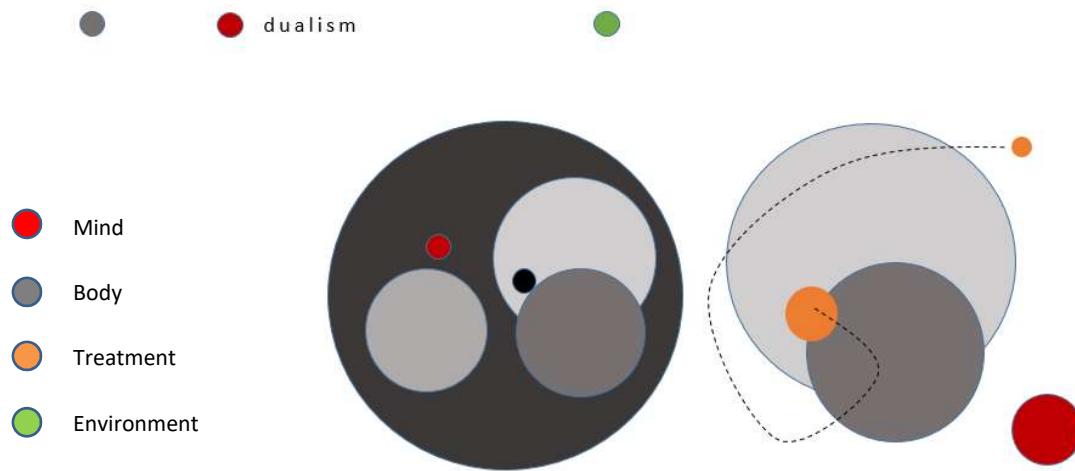


Figure 2: Dualism and the Mind-Body Relationship, Concept Diagram

Western medicine studied the body as though it were a machine (Engel, 1977). The spirit, a transparent, indeterminate, enigma became consigned to religious thought (Clarke, 2006).

Rational inquiry provided many advances in medicine and other applied sciences. Terms used to describe a phenomenon in one line of inquiry are transferred to another. For example, a definition of stress as a “constraining force or influence”, shares a similar definition with one used in physics (“stress,” 2017). The Western worldview observes stress as a pressure on the body or mind. Since the mind could not be observed, it became a topic of argument. As a way to explain the essence of matter Descartes (17th C) proposed Dualism. This philosophical view proposes a fundamental disconnect between the body and mind leading to a biomedical study of illness and disease (Descartes, 1996; Duncan, 2000). Medical advancements in Western medicine are founded upon both Aristotelian and Cartesian philosophies.

Greek Philosopher, Plato (4th Century BCE), presented Platonic Dualism, by recognizing that opposites exist; however, they are in a state of balance or harmony. The Eastern paradigm includes religions such as Hinduism, Buddhism, and Taoism. These practices, performed rituals, recited stories, and used metaphor to guide individuals toward a harmonious relationship with self,

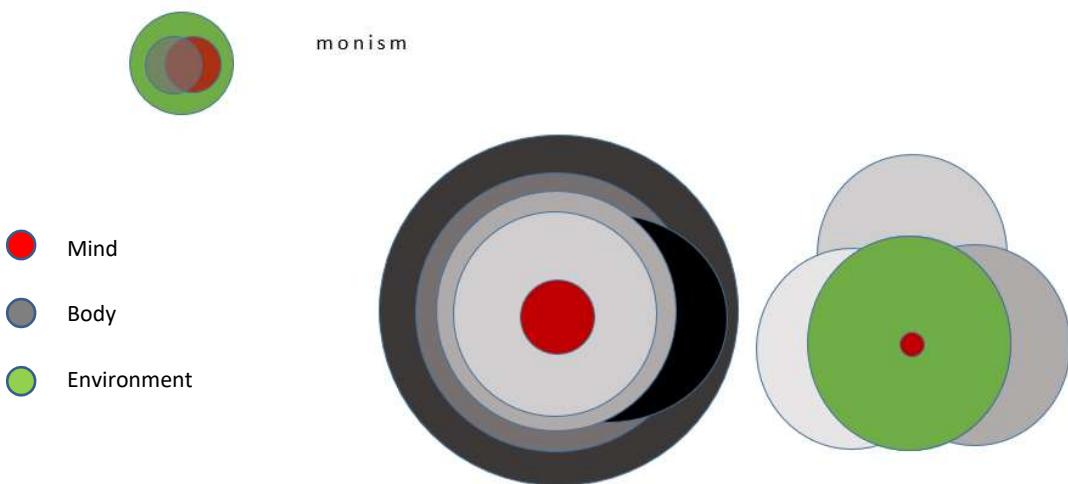


Figure 3: Monism and the Mind-Body Relationship, Concept Diagram

nature, and reality. By maintaining harmony through focused attention and mind-body practices, one may restore balance and function to a physical system. Since mind and body flourish from a single energy source, chi or prana, Eastern medical practices seek to help the body heal itself in harmony with nature (Stempsey, 2001). Acupuncture, yoga, herbal remedies, meditation, and nature experiences help restore balance to the human system.

Regardless of philosophy, an individual responds to stress with psychological, emotional, biochemical, behavioral, physical, spiritual, environmental, neuroendocrine, and physiological effects (Dyrbye et al., 2014). Three psychological and physiological conditions found in work-related settings contribute to burnout: emotional exhaustion, depersonalization of clients and individuals, and reduced personal accomplishment (Christina Maslach et al., 1986). Emotional exhaustion is the most significant factor contributing to burnout (Christina Maslach & Jackson, 1981). It deflates energy, corrodes a positive psychological state, and erodes engagement (W. B. Schaufeli, Leiter, & Maslach, 2009). Initiatives aimed to treat individuals with burnout include stress-reduction, cognitive therapy, coping strategies, and wellness programs.

Mindfulness-based cognitive strategies have been clinically shown to promote resilience in professionals suffering from burnout (Kabat-Zinn, 1990a; Krasner et al., 2009; Pflugeisen, Drummond, Ebersole, Mundell, & Chen, 2016; Shapiro et al., 2005; Siegel, 2010). It borrows a Buddhist practice of self-awareness and applies a psychotherapy that helps individuals renegotiate negative thought patterns. Mindfulness applies a process that begins with applying a certain quality of attention to a present experience (Bishop et al., 2004; Kabat-Zinn, 1990b). The “quality” noted appears as a patient, open, aware, curious attitude that accepts, trusts, withholds judgement and lets go of preconceptions (Kabat-Zinn, 1990b). The Mindfulness-Based Stress Reduction (MBSR) program was developed by therapists trained in Eastern philosophy. The program accumulates

contemplative Eastern practices, and transposes them to treat the stress responses. If practiced daily, mindfulness meditation acts as a hygiene tool that guards against mal-adaptive methods of managing stress and buffers emotional exhaustion within the workplace.

Based upon background presented here, the Western medical, systematic approach to healing and healing garden design, may be improved upon. Using a Western paradigm, one could potentially think about managing burnout by providing treatments and environments, which are devoid of stressors. In regard to landscape architecture, this design recipe could be taken too literally: remove stressors, then remove ill-health. Healing gardens inspired by mindfulness-based practices, which show favorable empirical results, may be necessary for physician well-being. Eastern traditions provide an alternative, or a more spiritual, approach. In “From the Pragmatic to the Spiritual,” Clare Cooper-Marcus, an educator in landscape architecture and architecture, suggests that a shift in perspective may allow designers to understand how both Eastern and Western paradigms provide insight toward designing and managing built environments (Altman, Christensen, & SpringerLink, 1990).

Medical Facilities through Time

Healing architecture has evolved over time. An interrelationship between science, medicine, the outdoor environment, and visual arts can be traced to antiquity (Marek H Dominiczak, 2014). Before the chasm that exists between modern, Eastern and Western medical traditions, the healing process was integrated with symbolism, myth, art, landscape, and architecture. For healing, the Greeks built temples to honor the gods, who had healing powers. Greeks payed visits to temples, open structures, designed using mythological and symbolic art. These healing centers included space for ritual, purification, overnight accommodations for sleep

therapy, and sacrifice. The structure merged with the landscape to inspire awe in the visitors (Marek H. Dominiczak, 2001; W. M. Gesler, 1993). Hippocrates, the “father of modern, Western medicine”, taught his medical students in the town center under a “platan tree” as opposed to an indoor environment (Marek H. Dominiczak, 2001). This becomes significant point when considering the nature of today’s medical education and associated indoor environments.

Since medieval times, healing gardens provided a natural environment for patients seeking restoration from ill-health outside a medical facility. For protection during the Middle Ages, constructed walls encircled such facilities, manors or churches. The interior, open space became a lived space, which accommodated prayer, work, and mealtimes (Gerlach-Spriggs et al., 2004). Monastic, cloister gardens resemble the Paradise garden described in Eden (Genesis 2:10-15).

Large municipal hospitals of the Renaissance placed less value upon the relationship between human and environment. A more scientific approach to healthcare prompted a trend, which closed the facility off from the natural environment and placed patients, economically and efficiently, within long corridors (Gerlach-Spriggs et al., 2004). Epidemics and hygiene practices lead administrators to quarantine and isolate the ill from society. Medical reformers, like Florence Nightingale, recognized the value outdoor environments had upon healing and sought to change these practices (Gerlach-Spriggs et al., 2004).

The pavilion-style buildings, asylums, and sanatoria of the 19th and mid-20th century, drew inspiration from Florence Nightingale’s recommendations. These guidelines were based upon personal observation and nursing experience. Nightingale stressed how natural environments were essential to the healing process. Access to natural outdoor environments and sensory experiences garnered from them, benefited the mind and body. Her pragmatic descriptions of a healing environment noted a list of comforts and necessities: natural ventilation; direct and indirect

sunlight; environments devoid of unnecessary noise; a view outside through a window to brightly colored flowers; opportunities to work in the kitchen garden or on the landscaped grounds if able; and opportunities to exercise in outdoor gyms (Nightingale, 1863).

In the modern era, advancements in technology and scientific exploration of the body and medicine precipitated a change in medical architecture in the mid-20th century. Sprawling pavilion-style hospitals were replaced with efficient multi-storied hospitals (Gerlach-Spriggs et al., 2004). Medical specialties became compartmentalized. The body became increasingly separated from the mind in treatment of disease. The natural environment existed separately of the medical facility. Design followed course within the prevailing scientific trends in culture. Access to therapeutic benefits of nature vanished in lieu of parking garages, enclosed air conditioning, and artificial lighting (Marcus, 2007).

The Cultural Context of Health

The dualistic nature of Western healthcare considers the body with an analytic, reductionist, systematic manner. Some discuss that this standard of practice shaped a paternalistic model of healthcare where physicians were practicing as cold technologists rather than caring healers (Emanuel & Emanuel, 1992; Ronald M. Epstein, 1999; Santorelli, 2007). It is well-documented that emotion has a mind-body consequence. Characterizations of emotional stress effect the autonomic nervous system causing observable changes in heart rate, pace and quality of breathing, blood pressure, and hormone levels (Borrell-Carrio, Suchman, & Epstein, 2004).

Dissatisfied with dualistic nature of medicine, George Engel, an American psychiatrist, sought a holistic alternative to the biomedical model of health. Engel believed that the mechanistic model of healthcare neglected the human dimension of suffering and the inherent influence of the

observer on observed. Engel compelled physicians to adopt a biopsychosocial model or “patient-centered” care (1977). In the later part of the 20th century, phenomenological medical training gained momentum in the healthcare education system. This healthcare method delivered a more holistic approach to human illness and challenged doctors to provide a compassionate undercurrent to medical care. Although patient-care improved, general perception of wellness did not (Borrell-Carrio et al., 2004).

General health in the United States has improved over time, yet subjective experience of well-being, has declined due to changes in culture and the medical landscape (Barsky, 1988). The Western, biopsychosocial medical model better explained processes and managed patients more comprehensively, yet the general population swayed toward an interest in indigenous and traditional methods of healing. People, seeking an improved sense of well-being, sought alternative treatments as a supplement or as a substitute for Western, evidence-based medicine (Astin, Shapiro, Eisenberg, & Forsy, 2003).

Furthermore, advancement in technology such as microscopes and Magnetic Resonance Imaging (MRI) lead to a greater understanding concerning biological and chemical processes, which could not be identified through observation alone. These breakthroughs prompted scientists to discover previously unknown properties of the human body through new specialties such as endocrinology and neurobiology. Additionally, modern physics raised new questions concerning the reality of nature through the study of quantum mechanics. Healthcare began to shift from a Cartesian philosophy to a holistic, a quantum-based inquiry (Patterson, 1998).

Spiritual threads such as art, history, and mythology wove reminders within the western’s psyche of our mysterious connection to nature. These cultural reminders, provided by Native Americans and indigenous populations around the globe, provided reminders of sacred, found in

the natural environment and our dependence upon Earth's resources, reverence to its essence as a biosphere, and man's interrelationship with Earth. The environmental movement set the stage for individuals questioning their personal relationship to their environment. During the 1960s, advancements in exploration and cross-cultural influences opened the Western society to new ways of conceptualizing their experiences.

Westerners began to reflect upon their relationship to nature due in part to these selected cultural events: *Walden*, by Thoreau (1854); the founding of the National Park Service (1900); images of American wilderness, captured by Ansel Adams (1940); Rachel Carson's writing, *Silent Spring* (1962); and the first images of Earth from space (1966). Environmental laws and protective measures were put in place to protect land, sea, and air. Theodore Roszak, a leading ecopsychology theorist, examined the divorced relationship between man and nature and criticized Western civilization's repression of spiritual awareness (T. Roszak, 1992; T. E. Roszak, Gomes, & Kanner, 1995).

These events gave rise to new areas of inquiry such as environmental psychology. Western researchers and philosophers, such as Edward O. Wilson, Kellert, and Theodore Roszak, promoted "new", ancient ways of conceiving our evolutionary relationship to the environment.

Studies by behavioral researcher, Ulrich (1984), and environmental researchers, Cooper-Marcus and Barnes (1995), contributed to the acceptance of the mind-body connection with regard to



Figure 4: View of Earth from Space (Photo: NASA on Unsplash)

nature and well-being. Throughout the 20th century, pioneering Western advances and the cultural momentum strengthened the relationship between humans and Earth. All-the-while, the Eastern hemisphere remained bound and assured of the indivisible relationship.

Alternatively, the Eastern paradigm is based upon Monism, which is a belief that all systems, events, elements of physical and spiritual nature are interconnected. This worldview considers that “mind-and-body” and “culture-and-nature” phenomena are single, indivisible entities. Dualism exists in this paradigm, yet each opposite is represented in the whole. The yin-yang symbol represents this concept best. Eastern ideology emphasizes the restorative qualities of nature. The mind and body functioned best when in harmony with nature because they were considered extensions of the universe’s life force. “Chi” is the name of that energy giving life force. Tao (Chinese origin), or Dharma (Buddhist term) signifies the “path” or “way”. The principle conceptualizes the groundwork of Eastern thought: to find the “truth”, one must look inside. That truth is a given, universal knowledge. Through concentrated efforts practicing Tao, the mind and body can become integrated rather than disassociated. Buddhism, Confucianism, Taoism, and Hinduism are structured upon this philosophy.

Alternative healing methods, stemming from Eastern beliefs, include practitioner-based therapies such as chiropractic adjustment, acupuncture, massage, and traditional self-care techniques such as herbal therapy, yoga, and deep relaxation (e.g. meditation, guided imagery, deep breathing, and progressive relaxation) (Eisenberg et al., 1998; Tindle, Davis, Phillips, & Eisenberg, 2005). Critics argue that “alternative” therapies have been adopted without rigorous scientific evidence and scrutiny (Fontanarosa & Lundberg, 1998). Mind-body therapies, however, once seen as “marginal”, “alternative”, “unconventional”, “integrated” and “complementary”, prove effective for stress. This includes using mindfulness-based therapy to treat burnout in

physicians (Astin et al., 2003; Goodman & Schorling, 2012; Kabat-Zinn & Hanh, 2009; Rainforth et al., 2007; Tacón, Caldera, & Ronaghan, 2004).

Furthermore, cognitive neuroscientists have sought to map the mind-body relationship, which underlies Buddhist tradition. Neurologists found a correlation among stress-reducing, alpha brainwaves, yoga, and meditation (Kamei et al., 2000; Kasamatsu & Hirai, 1966). These relationships illuminate the mind-body relationships that help shift conventional ways of conceiving reality. The findings may also help shift Westerners' approaches to stress management.

The background offered above explores the context and guiding beliefs, which accompany Western medical settings. Physician burnout matures while steeped in unhealthy healthcare environments. The following section will examine the clinical, social, and environmental aspects of physician burnout. It paints a portrait of the designed environment found in medical settings.

EXAMINATION: PHYSICIAN BURNOUT

“All my experience as a psychologist leads me to the conclusion that a sense of reverence is necessary for psychological health. If a person has no sense of reverence, no feeling that there is anyone or anything that inspires awe, it cuts the conscious personality off completely from the nourishing springs of the unconscious. “ (Robert Johnson quoted in Gablik, 1991, p. 76)

Recognized in the 1970s as “compassion fatigue”, burnout affects physicians, caregivers, teachers, and workers in the human and social services (Christina Maslach et al., 2001). The phenomenon breaks into three components: clinical, an individual’s mental health; social, the quality of personal and professional relationships; and situational, the work environment (Regehr et al., 2014; Reynolds, 1997). Literature and medical professionals report a variety of factors contributing to stress and burnout in medical settings. Findings warn that physician burnout is increasing (Tait D Shanafelt et al., 2015).

Individuals suffering burnout report the following emotions: depletion, fatigue, overextension, lack of enthusiasm, reduced personal accomplishment. Cynical manners, negativity, and insensitivity toward patients also transpire during patient interactions (Christina Maslach et al., 1986). Physicians suffer overload, depression, anxiety, ill-health, sleep deprivation, social isolation, divorce, substance abuse, suicide ideation, and disillusionment (Christina Maslach et al., 2001; McCue, 1982; Oaklander, 2015; Wallace et al., 2009). Engagement provides a positive antidote to burnout (Christina Maslach & Leiter, 1997). Wellness strategies used to buffer physicians from burnout include the following: beneficial personal and professional relationships,

spiritual practices, finding meaning in work, self-development, cultivating positive attitudes, and mindful communication (Krasner et al., 2009; Shanafelt et al., 2003).

Emotional Exhaustion in Early-Career Physicians

In ancient Greece, Hippocrates and his associates introduced a healing method based upon care, curiosity, and concern for patients. Upon graduation from medical school, young, modern-day physicians traditionally take the Hippocratic Oath. This rite describes the code of conduct for a medical professional. A physician vows, “I swear to fulfill, to the best of my ability and judgment, this covenant...” (Lasagna, 1964) With altruistic idealism, graduating physicians acknowledge: “...I will remember that there is art to medicine as well as science, and that warmth, sympathy, and understanding may outweigh the surgeon's knife or the chemist's drug...I will remember that I do not treat a fever chart, a cancerous growth, but a sick human being...” (Lasagna, 1964) Yet, it is these highly stressed, emotionally exhausted, graduating medical students taking this oath, who report the most burnout compared to physicians in later stages of their career (Dyrbye et al., 2014).

Medical students enter the field already feeling burnout (Shanafelt, Bradley, Wipf, & Back, 2002). Passage through residency programs, continues to present heavy workloads, stress, and lack of sleep. Residents navigate a system that operates within an extremely ridged structure of hierarchy and find little social support among peers, supervisors, and other colleagues (Christina Maslach et al., 2001). Physicians suffer in social isolation (McCue, 1982).

Young physicians learn to cultivate a deep sense of personal and professional control (McCue, 1982). They witness suffering, horror, and death. They feel uncertainty, fear of making mistakes, and a sense of personal loss when a patient dies. They manage discontented patients and

heartbroken family members. All-the-while, physicians practice under severe time pressures; substantial administrative demands; a strict code of professional conduct; and within fast-paced, emergency situations. Personal emotions, which may be negative and distressing, emerge. To cope with emotional exhaustion, some physicians rely upon mal-adaptive methods and pay little attention to self-care (Arnetz, 2001; McCue, 1982).

Mid-Career and Psychological Stress

To survive professionally, physicians suppress and repress emotions (Firth, 1986; McCue, 1982). Building on their medical training, they hone their bedside manner to respond compassionately to patients. Externally, they may perform empathetic responses; however, internally they feel unable to provide genuine compassion. They lose touch with their ability to show empathy, to care, and to help patients manage difficult emotions (Boyatzis, Smith, & Blaize, 2006). They suffer “compassion fatigue”.

In addition to compassion fatigue, it is argued that physicians also suffer from physical and mental fatigue (Barnes, 2009; Oaklander, 2015; Raab, 2014). While managing many patients, executing medical procedures, keeping charts organized, completing reports, responding to insurance companies, and negotiating shifting demands, physicians must operate on a high-order cognitive level. This directed attention requires effort and is necessary for meta-cognition. Meta-cognition occurs in highly-developed cognitive centers of the brain’s neocortex and can become strained easily (S. Kaplan & Berman, 2010). Prolonged periods of strain can leave the resources of this processing center vulnerable to fatigue.

Both compassion fatigue and directed attention fatigue contribute to the stress reaction found in the psychological component of burnout. Many seek to fully comprehend the mind-body

relationship during a psychological stress reaction (Caplan, 1964; Selye, 1976). Behavioral researchers evaluate the individual's perception of stress as a "stimulus-appraisal cycle" or as a balance between environment and assessment of one's capability (Pearlin, 1989; Sarason, 1984; Spielberger, 1966).

Maslow's Hierarchy of Needs Theory, explains that individuals seek desires graded as a pyramid from the most basic needs (food and security), providing the foundation of the pyramid, to transcendence, topping the pyramid (S. E. Hobfoll, 1989). Freud's pleasure principle describes a condition where individuals pursue pleasure and avoid pain (S. E. Hobfoll, 1989). A stress reaction is caused by a mismatch between a demand and how an individual perceives the depletion of the identified resource (Stevan E. Hobfoll, 1989).

The Conservation of Resources Theory (COR) describes the emotional desire to preserve a valuable asset. This theory suggests that stress blooms from a locus, or perceived loss. Fixation upon the potential loss of a valued (S. E. Hobfoll, 1989). Subjective, symbolic value placed upon resources such as objects, life conditions, personal characteristics, and energies are fundamental to whether or not loss will be suffered. Stress develops during the interaction between a person and their environment (Lazarus & Launier, 1978).

Cognitive therapy assists individuals in processing emotional reactions. Clinical psychologist, Steven Hobfoll, suggests that stress may be reduced by reassessing one's way of thinking. By shifting to a positive outlook and reinterpreting subjective value placed upon the resource, attentional control shifts from stimulus to distraction. Hobfoll calls this cognitive change "reappraisal" (1989). Kanske and colleagues stress the importance of this ability to reassess value by stating, "The regulation of emotion is vital for adaptive behavior in a social environment." (2010, p. 1) The following describes therapies aimed to treat emotional exhaustion due to stress.

Associated Therapies Treating Emotional Exhaustion in Physicians

Psychological stress causes negative well-being. Individuals under stress suffer elevated blood pressure; increased cortisol levels; loss of recuperative sleep; impaired ability to concentrate; and risk for suicide ideation. Increased risk for stress-related diseases also occur in the following systems: musculoskeletal, cardiovascular, respiratory, endocrine, gastrointestinal, nervous, and reproductive systems (Tovian et al., 2017). For physicians particularly, expectations of perfection compound doctors' stress (Goldman, 2011; Irving et al., 2014). A profound fear of discussing professional mistakes, failings, and challenges leaves physicians feeling alone, ashamed, and unsupported (Goldman, 2011). Books, documentary film productions, research, and antidotes reveal that physicians have the highest rate of suicide among any profession in the United States (Gold et al., 2013; Nagy et al., 2016; Symon, 2016). This reveals a crisis.

Examining the mental and social health crises among our physicians, becomes the first step in understanding physician burnout. Fundamentally, becoming aware of the symbolic value and consciously changing one's subjective attachment to that value requires attention. In addition to clinical and social factors, the medical environment contributes to burnout. The following discussion will implicate the environment, which includes culture and physical quality of space in healthcare settings.

Shanafelt and colleagues surveyed US physicians and found that over 50% of respondents reported burnout in the following specialties by order of most severe perceived burnout: emergency medicine, general internal medicine, neurology, family medicine, otolaryngology (Shanafelt, Boone, et al., 2012). Just short 50% of respondents reported burnout in the following specialties: orthopedic surgery, anesthesiology, obstetrics and gynecology, radiology, and physical

medicine and rehabilitation (Shanafelt, Boone, et al., 2012). Most of these specialties are included with large medical complexes like community hospitals. Time restrictions and access to nature may be difficult for medical staff due to the remoteness of the outdoor environment from within the workplace. General, internal medicine and family medicine are specialties most likely to exist as a building facility separate from the hospital complex.

Researchers have also criticized the design found in 20th century hospital design as inhumane (Berry, Parker, Coile Jr, & Hamilton, 2004; W. Gesler, Bell, Curtis, Hubbard, & Francis, 2004). A correlation exists among natural and designed environments and brain activity (Eberhard, 2009). Environmental stressors effect medical staff physically and emotionally (Mourshed & Zhao, 2012; Riemer, Mates, Ryan, & Schleider, 2015; R. S. Ulrich et al., 2008). When designing for a group of people, it is important to understand the relationships between design and human response (Sternberg & Wilson, 2006).

Access to nature remains essential to maintain well-being in the workplace. Research finds that physicians go to healing gardens to decompress after a difficult situation (Whitehouse et al., 2001). Cooper-Marcus and Barnes survey the benefits of healing gardens and design recommendations in healthcare settings. Well-regarded restorative landscapes include the following opportunities: visual stimulation, hands-on activity, emersion in the outdoor environment, and stress relief (Marcus & Barnes, 1995). Design literature, however, lacks evidence-based design recommendations (Marcus & Sachs, 2014; Ward Thompson, 2011; Westphal, 2003).

Visitors to restorative landscapes report positive associations with green foliage, flowers, peaceful water, and the sights and sounds wildlife such as butterflies and birds (Roger S Ulrich, 1999). Designed to accommodate patients' and visitors' needs, they offer a natural escape, where

one may restore one's sense of well-being and receive spiritual, physical, and emotional benefits (S. Kaplan, 1995; Marcus & Barnes, 1995; Roger S Ulrich & Parsons, 1992; Ward Thompson, 2011). Because healthcare business offers a competitive service, healing gardens add value to the property and are marketed to potential clients as valuable resources.

Designers conceptualize public spaces in healthcare settings with the intent to enhance health, promote a safe environment, and breed well-being. Medical administration assign designers with additional responsibilities related to "curative or palliative purposes" (Westphal, 2003). A healing garden designer aims to be aware to the emotional state of the intended visitors while "creating a *place* and facilitating a *process*." (Marcus & Barnes, 1999, pp. 88-90) Set alone, healing gardens are not a cure. They offer a vital enrichment to the medical setting. Nature provides a valuable compliment to medical treatments, and a valuable component to workplace design (R. Kaplan, 1993). The facility is just as much a workplace. Challenges to using outdoor environments are access, time, distance, and safety concerns (Grahn & Stigsdotter, 2003). Many theories seek to explain the connection between human and environment. Clare Cooper-Marcus suggests that healing garden design must begin with an understanding of Supportive Design Theory (Marcus, 2007).

Supportive Design Theory

Psychologically, Supportive Design Theory was developed by Roger Urlich, a behavioral scientist (1991). Urlich writes that if stress is the illness in the medical setting, then restoration is the cure (1999). Steps taken to include restorative, healing gardens for physicians could have many advantages. A designated outdoor space offers social support; perceived stress decreases and future stress responses are diminished; reduced depression; and increased job satisfaction (Roger S

Ulrich, 1999). Psychologically supportive design includes the following elements (Campbell, 1983; Evans, 1984; Roger S Ulrich, 1991, 1999; Vischer, 2007):

- Sense of control and privacy
- Social support and opportunities for gathering and socialization
- Opportunity for physical exercise and movement
- Access to nature and positive distractions (wildlife, water, soothing sounds)
- Environmental comfort (remove physical and ambient stressors)

Nature experiences are found to reduce stress in multiple empirical studies (Hartig et al., 1991; Herzog, Colleen, Maguire, & Nebel, 2003; Nejati, Shepley, Rodiek, Lee, & Varni, 2016). Research suggests that short bursts of outdoor exercise boosts positive feelings and reduces stress (Hansmann, Hug, & Seeland, 2007; Pretty et al., 2007). Additionally, empirical research found that medical staff prefer an open, natural setting for passive activities and an enclosed, natural setting for active activities (Barnhart, Perkins, & Fitzsimonds, 1998). A high correlation exists between job satisfaction and access to nature in the work environment (Nejati et al., 2016).

Attention Restoration Theory

“Directed attention” is a high-level, cognitive process; necessary for meta-cognition; and requires effort. This effort is under voluntary control and is subject to fatigue; therefore one must remain vigilant by resisting distraction (S. Kaplan, 1995). “Attention fatigue” suggests that the human brain has a processing capacity. Highly stimulating or stressful work environments contribute to cognitive overload in the neocortex. In physicians, the cognitive-processing mechanism suffers fatigue over the course of a shift (Levin et al., 2007; Solomon et al., 2016).

Attention Restoration Theory (ART) posits that restorative, natural environments reduce fatigue associated with directed attention (R. Kaplan & Kaplan, 1989). Cognitive restoration occurs when one has the ability to reflect within a natural setting (R. Kaplan, 1993; Sahlin et al., 2016; Sullivan & Kaplan, 2016). Nature reduces performance pressure on the brain (Berman, Jonides, & Kaplan, 2008). A type of experience called, “soft fascination”, which occurs while looking at positive images of nature or while being in natural environments helps to renew executive functioning in the brain (S. Kaplan, 1995).

Soft fascination, processed within the instinctive, reptilian portion of the brain, refocuses intensity in processing centers. This occurs under favorable conditions, and when the environment meets a person’s basic physical and emotional needs (Hartig et al., 1991; R. Kaplan & Kaplan, 1989). Directed attention can be restored in natural, peaceful environments, which are rich in characteristics necessary for restorative experience (Berman et al., 2008; R. Kaplan & Kaplan, 1989; S. Kaplan & Talbot, 1983). Soft fascination opens a door to a positive state (Roger S. Ulrich et al., 1991). Exercising in nature increases positive effects (Pretty et al., 2007). Renewing functional capacity in the neocortex expands one’s ability to work efficiently and manage a purposeful, organized life (Lezak, 1982; Stuss & Benson, 1986). Components of a restorative environment include the following (S. Kaplan, 1995):

- Soft fascination (opens a door to a new state)
- Being away (includes a physical move to a new environment or a visual view out a window)
- Extent (rich, coherent, engaging distraction)
- Compatibility between purpose and inclination (Presence continues without struggle)

Empirical research finds that nature contributes to a restful experience and positively effects health (Hartig et al., 1991; Herzog et al., 2003; S. Kaplan & Talbot, 1983). The correlation is found among various experiences. Viewing nature, whether it is through a window; in an image; or in a live aquarium, has a restorative, healing affect (Berto, 2005; Leather et al., 1998; Roger S. Ulrich, 1984). Being in nature reduces psychological stress and replenishes directed attention (Berman et al., 2008; Roger S. Ulrich et al., 1991). Gardening and being in direct contact with nature increases well-being and inner peace (R. Kaplan, 1973; Relf, 1992). Individual preferences for experiences in nature also affect restoration (R. Kaplan, 1977).

Attention State Training

Cognitive therapy, or Attention Training, provides a Western method to alter cognitive processing with the goal of reaching an alternative emotional reaction. A similar theory draws strength from Eastern philosophy while seeking to explain how nature experiences can help retrain the mind-body reaction. Attention State Training offers a method that synchronizes the mind, body, and spirit as a single unit. This process occurs in a natural environment and creates a positive change in state (Y.-Y. Tang & Posner, 2009).

Experiences such as meditation, controlled movement, while being exposed to nature, transform an individual's state-of-mind. The research suggests that multiple sensory inputs lead to improvements to emotional processing and changes the brain where self-regulation occurs (Y.-Y. Tang et al., 2010; Y. Y. Tang, Holzel, & Posner, 2015). Integrative Body-Mind Training seeks balance and harmony between mind-body and nature-culture. Through concentrated focus, one can gain control of "emotional cognition" through the practice of postures and relaxation (Y.-Y. Tang & Posner, 2009). Many practices like yoga, tai chi, and Shinrin-Yoku, or forest bathing, become opportunities for Attention State Training and stress reduction (Gura, 2002; Kim, 2016;

Taylor-Piliae, Haskell, Waters, & Froelicher, 2006). Practicing mindful meditation through integrative body-mind methods shows improvements in directed attention that produces greater benefits in the body-mind state over time (Slagter et al., 2007). The following list describes Attention State Training (Y.-Y. Tang & Posner, 2009):

- Practice in an outdoor environment
- Mindful meditation
- Integrative body-mind training like tai chi (Chinese) or yoga (Indian) practices

Promoting collaboration between physicians and the medical organization, Swenson and colleagues summarize, "...physicians need some degree of choice (control over their lives), camaraderie (social connectedness), and an opportunity for excellence (being a part of something meaningful)." (Swensen, Kabcenell, Shanafelt, & Sinha, 2016, p. 105) Urlich's Supportive Design Theory recommends providing choice and social support. Choices can be made in the amount of time spent outdoors; the location where one may remain; whether or not to participate in a programmed activity, and levels of social comfort. Social support may be granted at various levels, through programed activity, and choreographed by seating arrangements: triangulation, gathering, group, and single seating. Being a part of something meaningful requires an effort from individual physicians and the organization. Though it has been discussed (S. Kaplan, 2001), that current landscape design theories no not specify "meaning" in the set of landscape conditions. Extracting meaning is a skill found through mindful meditation. Possessing senses of reverence and meaning help individuals reassess value toward available resources. This ability builds stress resistance as described in Conservation of Resources Theory (Stevan E. Hobfoll, 1989).

All above-mentioned theories help understand the potential effect the outdoor environment, nature, and nature images have upon the person experiencing nature. Landscape and perception are complex concepts (Meinig, 1979). The need for natural environments, whether transplanted in a pot and set indoors; viewed through a window; or wholly experienced on a mountain hike, is necessary for maintaining human health and well-being.

DIAGNOSIS: ENVIRONMENT

“A better building is one that facilitates physical, mental, and social well-being and productive behavior in its occupants.” (Berry et al., 2004, p. 6)

Evidence-based design provides a method by which built spaces are analyzed and proven to reduce stress (Roger S Ulrich, 1991). Designers place a portion of their attention upon the comfort of physicians and staff during the design process. Considerations include the following: organic themes in art; natural colors within interior spaces; window views of greenspaces; natural and dynamic lighting; indoor landscaping and water features; and access points to a designed outdoor environment. These design elements have stress-reducing benefits in the medical setting (CarilionClinic, 2016; Hartig, 2007; R. Kaplan & Kaplan, 1989; Roger S Ulrich, 2002). While architectural variables such as color, light, and furniture arrangement contribute to a soothing environment, the facility’s program-driven philosophy places sanitation and inoculation as the paramount priority. Positive clinical outcomes, financial gain, and competition places the healthcare industry in a highly competitive market. Burnout in physicians contributes to the industry’s economic strain.

Questioning the relationship between health and nature, Roger Urlich, investigated healthcare design by examining post-operative healing times (1984). His findings suggested that nature was germane to the healing process. Since that seminal report, many researchers sought evidence to support the mind-body relationship. Relationships between the mind and body can be found among disciplines such as architecture, neuroscience, medical phenomenology, environmental psychology, and landscape architecture. The following section will describes

individuals' and organizations' responsibilities to maintain well-being in the workplace and the traditional healing garden design approaches used within the medical setting.

Physician: Resourcefulness inside the Medical Culture

Prioritizing self-care becomes a healthful act of defense and fortification to resist stress in the workplace (Zwack & Schweitzer, 2013). Physicians tend to not live healthy lifestyles. They overlook best-health practices such as regular physical exercise, a healthy diet, quality rest, social connection, and introspection. Additionally, physicians lack access to nutritious meals or snacks during their shift (Lemaire et al., 2010).

Rest and time spent recovering from trauma is necessary for function (Herbert Benson & Klipper, 1992; Lambert & Lambert, 2008). Attention to personal growth such as introspection, self-awareness, and self-understanding reduces the consequence of stress in healthcare professionals (Fearon & Nicol, 2011; Regehr et al., 2014; van Dierendonck, Garssen, & Visser, 2005). In addition, “thriving” physicians report having an array of resources that balance work-related stressors (Shanafelt et al., 2003). The most resilient physicians report the following strategies: participating in leisure time activates such as sports and cultural outlets to reduce tension; fostering relationships with colleagues; developing supportive personal relationships; recognizing personal limits, mistakes, errors, and complications; making time for personal reflection; demarking clear boundaries between work and private life; limiting work hours; ritualizing time out periods; and practicing spiritual exercises (Arnetz, 2001; Quill & Williamson, 1990; Weiner, Swain, Wolf, & Gottlieb, 2001). Medical professionals agree that useful attitudes to maintain emotional health include the following: realism; reflexivity; positive outlook; recognizing when change is necessary; gratefulness; and appreciation (Jensen, Trollope-Kumar,

Waters, & Everson, 2008; Zwack & Schweitzer, 2013). These activities and mental mindsets balance work-related stress (Stevan E. Hobfoll, 1989).

Even though mindfulness-based and contemplative programs have provided physicians with an approach to manage work-related stress, Shanafelt and colleagues report that only 5% of physicians responded, “I engage in contemplative practices or other mindfulness activities such as meditation, narrative medicine, or appreciative inquire, etc.” (2015; 2012, p. 629) It remains clear that physicians need to reflect in an environment where they feel safe to discuss stress, frustrations, fears, difficulties, and dissents (Grol et al., 1985, p. 134). This statistic could however, be related to the fact that physicians do not have a safe, private, workplace environment to practice reflection and focus upon self-care.



Figure 5: Creating Resilience in Medical Facilities, Concept Diagram

Organization: Responsibilities Sustaining a Medical Culture

Burnout, however, is not merely a psychological affliction suffered by distressed individuals. It is an indicator of a dysfunctional, complex, social phenomenon, which occurs where social support from superiors and the organization is lacking (Christina Maslach et al., 2001). Researchers have pinpointed the following flaws in organization and structure: industrialization of medical care and mal-practice lawsuits (Arnetz, 2001); rotating shift-work causing a disruption in circadian rhythms (Coffey, Skipper, & Jung, 1988); workload (Foxall, Zimmerman, Standley, & Bene, 1990); oppressive management style causing lack of choice and autonomy (Waxman,

Carner, & Berkenstock, 1984); physical stress (Parshuram, Dhanani, Kirsh, & Cox, 2004); poor nutrition (Lemaire et al., 2010); and inadequate physician lounges (Mark H. Greenawald, 2016). Addressing these shortcomings becomes the responsibility of the organization. Promoting physician wellness can be accomplished through the following means: supporting autonomy, providing social support services, fostering professional networks across the organization, developing physician leaders, recommending a mentor, reflecting the values of medical profession, curtailing work-life interference, and encouraging work-life balance (Shanafelt et al., 2003; Spickard Jr et al., 2002; Swensen et al., 2016).

Throughout the 1980's, specialization of medical care, and compartmentalization of medical wards in hospital buildings created physical and social isolation among specialists. The Western model of healing was translated into hospital design and drove the industrialized design standard toward efficient, corporate, megastructures. Although, the "patient-centered care" model began to daylight that efficient structure to more humane environment, the economy of space still precluded a physician's lounge.

Physicians, especially, need a private place where they strengthen their weak social ties with peers, feel empathy and support, connect, and find meaning in their work (Goldman, 2011; Mark H. Greenawald, 2016; Wibel, 2016). Hospital architecture no longer supplies a private room for medical students, residents, and physicians. Hospital insiders call this room a "bunker". It is where physicians can relax, escape from professional rigor, talk candidly, and develop comradery (Goldman, 2014). It provides a private space to decompress and re-center. The bunker offers a precedent which leads this research toward the intent to create a similar, private, outdoor space for physicians within medical facilities.

Within the building, physician advocates and medical administrators recognize the burnout crisis (Ronald M. Epstein, 1999; Ludwig & Kabat-Zinn, 2008). They identify a dire need to relieve and prevent burnout in practicing physicians (C Maslach & Jackson, 1982; Nagy et al., 2016; Reynolds, 1997; W. Schaufeli & Enzmann, 1998; Shanafelt, Boone, et al., 2012). In response, researchers identify several physician-institution collaboration efforts that prove effective in treating physician burnout: healing arts programs, contemplative arts programs, Balint Group meetings, and Mindfulness-Based Stress Reduction programs (Ludwig & Kabat-Zinn, 2008).

Many stress prevention programs exist. Medical administrators have incorporated on-site, healing arts programs such as music, painting, movement, poetry, journaling, resilience training, and meditation programs to reduce stress and treat burnout (Krasner et al., 2009; Swensen et al., 2016). Healing arts programs include music engagement, visual arts, movement-based creative expression, and expressive writing.

Similar to healing arts, the contemplative arts have healing conventions based in the Eastern paradigm. Defined by a scholar, “contemplation” refers to ways of knowing and focusing attention, often but certainly not always part of a religious tradition.” (Fort, 2013, p. 23) Contemplative arts include a variety of meditative methods based upon concentrations like communication/connection and awareness. Subgroups of activities within these foci are stillness, generative, creative, activist, relational, movement, and ritual/cyclical (Duerr, 2015). Many additional practices exist. “Observing nature” is highlighted as a contemplative activity. This revelation is significant in context of this thesis (Fort, 2013).

Funds secured by these programs have provided healing gardens for the benefit of both healthcare consumers and hospital staff (CarilionClinic, 2016). Well-intentioned, these efforts do not reach physicians. When faced with raw, welling emotions, physicians are more likely to

hideaway in stairwells, restrooms, and hallways (Wibel, 2015). This is due to their experience of social isolation, and the desire to keep personal and professional control. Physician lack supportive professional relationships with their peers and supervisors. In the 1950's, psychoanalysis Michael and Enid Balint developed an approach to foster communication among physicians (R. Epstein, 2017).

“The ABS [American Balint Society] is unique in its focus on and approach to: actively engaging in the empathic care of others and of our professional selves; inspiring dedication and perseverance of health care providers; and developing essential skills for sustaining and enhancing resilience and longevity in practice. The **core values** that guide us include: Authenticity; Collective wisdom; Compassion; Empathy; Hope; Lifelong learning; Reflection.” (ABS, 2017)

Led by an experienced group facilitator, Balint Groups function among a small assembly of doctors. They meet regularly to discuss patient-physician relationships and to engage in open, reflexive dialogue. Personal stories and antidotes have a positive emotional impact (Blenkiron, 2005). Balint Groups have shown effectiveness in buffering physician burnout and fostering resilience in the practitioner. Some medical training programs and medical facilities practice this method. Having deep, reflexive knowledge of self becomes a critical component for group success. It is noted that “mindfulness practice” not only enhances Balint Groups but could also reinforce individual self-reflectiveness (Ronald M. Epstein, 1999).

In summary, two levels of burnout must be addressed in healthcare settings. First, individuals have the responsibility to cultivate healthy habits of mind and body. Second, the healthcare organizations have the responsibility to provide programs, administrative support, and wellness resources to their employees. Together, physicians and the healthcare-delivery system could foster healthy engagement. This diagram can also be used to analyze how well-balanced, or engaged, employees remain in the workplace. It can also analyze how well medical facilities provide support programs to sustain physician wellness.



Figure 6: Resilience through Engagement, Concept Diagram

As seen in the diagram above and in the previous text, “reflection”, emerges as a common theme, which weaves together the list of personal and organizational wellness strategies. Healthy reflective practice includes recognizing the difficulties of practice, appreciating of the positive aspects of life, identifying personal values, and identifying when self-care is needed. Solutions

come from both, individuals taking initiative for personal development, and organizational responsibility for addressing employee abuse (Shanafelt et al., 2003).

The following section will summarize how designers and healthcare clients have conceptualized healing gardens in medical settings. These spaces offer a respite from the medical environment. The following discussion will reveal how nature is beneficial to and valuable for maintaining well-being. Included in this discussion are programs typically used in therapeutic garden design, traditional design approaches, and healing garden typologies.

Assurance in Nature Experiences

Researchers seeking to measure the affect of merging “skill-based and nature-based programs” found that spending a relaxed 15 minutes viewing nature images during beginning mindfulness practice reduces the concentrated effort needed to focus on remaining mindful and “supported short-term attentional improvement.” (Lymeus, Lundgren, & Hartig, 2017, p. 16) Viewing nature allowed participants to quickly experience restoration and increased benefits of mindfulness practice. If images of nature could help offset the attentional effort required for mindful meditation (Hartig et al., 1991), then it appears a rational conclusion that being in nature would have a similar, if not more effective result.

Experiences in nature provide many emotional and cognitive benefits (Hartig et al., 1991). Environments, which reduce perceived stress adhere to theoretical underpinnings of emotional response to natural settings and environmental psychology related to greenspace (R. Kaplan & Kaplan, 1989; Marcus & Barnes, 1995; Stigsdotter & Grahn, 2003; Roger S Ulrich, 2002; R. S. Ulrich et al., 2008). Environmental psychologists, physicians, designers and many others recognize and recommend time spent in natural environments (Nisbet & Lem, 2015).

Healing gardens, though not in wild nature, accommodate multiple programs, design considerations, and elements intended to reduce stress. Experiences in outdoor environments contribute to good health in unconscious and conscious ways such as biochemical reactions and aesthetic experience, respectively. If the site and space precludes access to outdoor nature, then indoor landscaping can suffice. Viewing nature, being in nature, working in nature, and preference for natural environments contribute to positive affect. The following summary describes how nature experiences can help restore physicians from burnout.

Viewing Nature

Having a view to a natural setting has many physiological, psychological, and economic benefits. Psychological benefits increase in more natural settings as opposed to those with man-made elements (Velarde, Fry, & Tveit, 2007). Ulrich, Simons, Losito, Fiorito, Miles, and Zelson found that forest and water settings provide the most restorative, affective responses (1991). Buddhist monasteries are “intentionally sequestered environments” located in remote geographies steeped in awe-inspiring geographies including open sky, bodies of water, mountains, confluences, and bridges (Hoyez, 2007; Kabat-Zinn, 2005). Gardens surrounding meditation centers are especially beautiful.

Viewing a natural setting allows the observer to gain psychological distance (Lyneus et al., 2017). Landscapes can provoke “awe” and “curiosity”, which overpowers a current mental state allowing one to direct “attention away from the self and toward the environment.” (Shiota, Keltner, & Mossman, 2007, p. 961) As long as an environment is compatible with emotional state, then benefits will ensue (S. Kaplan, 1983). This interference corresponds to the Kaplans’ description of the cognitive shift, which occurs in restorative environments (R. Kaplan & Kaplan, 1989). As long as the scene does not include low-visual stimulation or unpleasant elements, a natural scene reduces ill physical symptoms and encourages the healing process (Roger S. Ulrich,

1984). In addition, landscape views reduce emotional and physiological effects of stress (Berto, 2005; Leather et al., 1998; Lyeus et al., 2017). These benefits increase job satisfaction and productivity (R. Kaplan, 1993).

If the window view and images have restorative elements, additional benefits are gained (R. Kaplan & Kaplan, 1989; S. Kaplan, 1995). Ulrich describes the cognitive affect as “wakefully relaxed” (1981). This peaceful state may be similar to the meditative state achieved by Zen Buddhist priests and disciples, whose meditative states were measured on an electroencephalogram. Neuroscientists revealed that the expert meditators achieve the serene, alpha brain-wave state (Kasamatsu & Hirai, 1966).

Seeing verdant landscapes affect “perceived openness,” more than an open view of water or a cityscape (Velarde et al., 2007). Urlich found that viewing a natural, savannah or park-like setting, or the activities of wildlife for 5 minutes reduces perceived stress (Roger S Ulrich, 1999). Other state changes have been associated with views of nature. They are relatedness and generosity toward fellow humans (Weinstein, Przybylski, & Ryan, 2009), and increase feelings of awe (Shiota et al., 2007), and happiness (Capaldi, Dopko, & Zelenski, 2014).

Being in Nature

Restorative environments reduce fatigue of associated with directed attention (R. Kaplan & Kaplan, 1989). People spending time within an outdoor environment receive additional affective benefits including self-reflection and positive emotions (Mayer et al., 2009). Studies found that relatedness to and generosity toward fellow human beings increased as one’s emersion into a natural environment increased (Weinstein et al., 2009). Participating in outdoor exercise in an outdoor, greenspace, despite intensity, duration, and type, increases mental health benefits (Pretty et al., 2007).

In relation to the built environment, Sternberg and Wilson posit that environmental stressors, geometry, sensory stimuli, and arrangement of space have a neurological reaction, which affects mood and well-being. Perception of safety, crowding, loud noises, and wayfinding are found to alert the stress response in the hippocampal portion of the brain (Sternberg & Wilson, 2006). Alternatively, garden visitors recognize that spaces containing trees, shrubs, flowers, and water allow for a restorative experience (Marcus & Barnes, 1995). Soothing nature sounds from running water, birds, and a breeze also enrich the experience of an outdoor space (Ulrich, 1999, pp. 74-75).

Working in Nature

Ecotherapy describes various methods of engaging in the outdoor environment to gain a sense of restoration. It was found that, by gardening, “Participants” encounters with the natural world brought a sense of balance and relief from everyday stressors and rekindled a sense of belonging to the world at large.” (Chalquist, 2009, p. 5) Working in nature promotes well-being (Roger S Ulrich, 1999). Direct contact with plants while in a garden, or horticulture therapy, provides many emotional and physical benefits (Relf, 1992).

Preferences for a Stress-Reducing Environment

Many stress-reducing landscapes include environments similar to those discussed above. Perceptual judgement of natural, scenic beauty may be found in images of “rushing water, large trees, grassy meadows and jagged mountain peaks” (Altman & Wohlwill, 1983, p. 63). Terry C. Daniel and Joanne Vining state that when assessing a landscape, “A high-quality landscape is one that evokes positive feelings, such as security, relaxation, warmth, freedom, cheerfulness, or happiness. Low-quality landscapes are associated with stress, fear, insecurity, constraint, gloom, or other negative feelings.” (Altman & Wohlwill, 1983, p. 65)

Topophilic Design

As described by geographer, Yi-Fu Tuan, *Topophilia* is the “affective bond between people and place or setting” (1974, p. 4). Furthermore, Tuan suggests that archetypes like an abundant valley, a protected seashore, and a remote island, symbolizing Eden, increase the positive affect (1974). As discussed earlier,

landscapes have the ability to affect emotion by harnessing perceptions, memories, values and applying them to a sensory experience. Meditative landscapes employ topophilic bonds to strengthen holistic ideology. Archetypes and symbols have embedded power in the landscape. A selected few are listed:

- Post
- Stupa
- Labyrinth
- Mandala
- Earth’s elements: air, water, fire, earth
- The cardinal directions: north, south, east, west
(meaning varies by culture)



Figure 7: Island Archetype (Photo: Chris Lejarazu on Unsplash)



Figure 8: Stupa (Photo: Creative Commons)

Eastern philosophy considers the human as an integral part of the environment. The mind, body, and spirit work in synchronization to remedy health concerns. Seeking harmony through practice was more beneficial than religious belief. These fundamental principles compel individuals to seek harmony between themselves and the natural world. Natural environments, like parks, forests, mountains, and bodies of water, were chosen to practice meditative, body-mind arts such as tai chi and yoga. The practice of yoga became synonymous with the Himalayan Mountains and the Ganges River. Yoga is described as “A local and global interpretation of the link between health and place.” (Hoyez, 2007, p. 114) Practice occurred in an ideal, remote place where the landscape symbolized desired human characteristics such as strength and serenity. Colors, imagery, and spatial arrangements evoked cleanliness, purity, awe, beauty, and sacredness. Western adaptations reproduced these environmental perceptions and crafted topophilia by carefully selecting colors, including imagery of mountains, applying heat, and installing a water feature to represent the Ganges River (Hoyez, 2007; Tuan, 1974).



Figure 9: Himalayas (Photo: Anna Purna on Unsplash)

Biophilic Design

Sustainable design and permaculture could also symbolize human connection to nature. The Biophilia Hypothesis suggests that humans have a necessity to connect with living things and an instinctive fondness of the natural world (Wilson, 1984). Biophilic design supplies humans with connection to life and vital processes (Caperna 2013). People respond to biophilic design with physiological, cognitive, and psychological responses (Ryan, Browning, Clancy, Andrews, &

Kallianpurkar, 2014). Placing value on the natural ecosystem by harmonizing built and natural environments could provide perspective and compassionate support. This concept works on the “...belief that a person can feel better taken care of in an environment where focus has been to promote the health of all living things.” (Marcus & Barnes, 1999, p. 102) Biophilia explains this desire to recreate the primordial union between human beings and nature. Much evidence coincides with experiences in the natural world and a renewed sense of vital energy (Chalquist, 2009). Design may seek to establish “wholeness” with the following methods and their associated patterns (Ryan et al., 2014, p. 64):

- Nature in Space (Visual/ non-visual connection to nature; non-rhythmic sensory stimuli; access to thermal and air flow variability, presence of water, dynamic diffuse light, and connection with natural systems)
- Nature Analogues (biomorphic forms and patterns; material connection to nature; and complexity and order)
- Nature of space (prospect, refuge, mystery, and risk/peril)



Figure 10: Nature in Space (Photo: Scott Webb on Unsplash)



Figure 11: Nature Analogues (Photo: Samuel Castro on Unsplash)

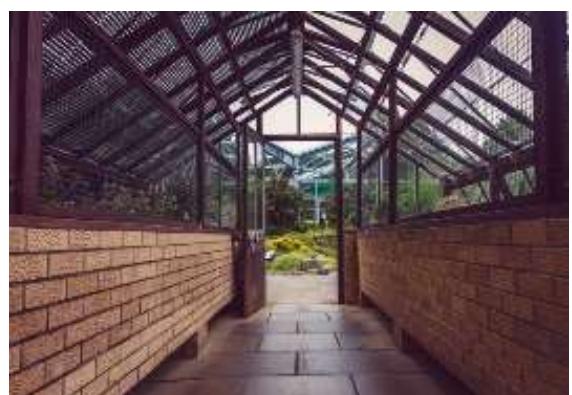


Figure 12: Nature of Space, Mystery (Photo: Claudel Rheault on Unsplash)

Traditional Healing Garden Approaches

Traditional healing garden approaches will be outlined in this section. Healing garden design includes traditional, botanical/ecological, and people oriented methods for nature experiences in medical settings (Marcus & Barnes, 1999). The traditional approach to healing garden design includes historic precedents such as the following forms and garden styles: labyrinths; Japanese Zen and Tea gardens; paradise; monastic; and cloister gardens. These typologies have rich histories in healthcare settings. Cooper-Marcus and Barnes state that “... drawing from these

ancient lessons when approaching the landscape design of present-day medical settings can provide a framework from which to begin; for these gardens are each walled, protected, and imbued with power. As such they are cultural archetypes for healing and restoration.” (Marcus & Barnes, 1999, p. 97) The following section highlights healing garden design precedents.

Labyrinths and Mazes

A Labyrinth is a unicursal maze. The maze persisted through time as a method for contemplation independent from religious affiliation. The labyrinth operates as kinesthetic, mental, emotional, and symbolic journey to a center (Sternberg, 2009). It offers a sense of cleansing and faith for a better future. Mazes may be traced with the finger or navigated, as a walking meditation. Travelers within the maze believed that the act of walking brought evil spirits to the center of the maze where they could be left behind. The transformative journey to transcendence was similar to a natural process, slow and sure (Winters, 1987). Leaving the labyrinth symbolized a “rebirth”. Ruminants of labyrinths exist in ancient Egyptian history, Greek mythology, and in Christian landscapes (Marcus & Barnes, 1999).



Figure 14: Labyrinth for Tracing Meditation
(Image: Creative Commons)



Figure 13: Traditional Labyrinth (Photo: Ashley Batz on Unsplash)

Japanese Zen and Tea Gardens

Japanese Zen and Tea Gardens provided visitors an abstract garden space for “zazen”, a non-analytical sitting, breathing, and stabilizing meditation practiced best in a place that is quiet, peaceful, calm, and harmonious. Design techniques seek to generate wisdom and compassion. Here nature is reduced to essential forms. Grouping of stones, raked pebbles, and distorted scale symbolize natural processes. These design methods direct philosophical contemplation, which calls to question perceptions of form, space, and time (Winters, 1987).



Figure 15: Japanese Garden Bridge (Photo: Creative Commons)



Figure 16: Japanese Garden in Portland, OR (Photo: Creative Commons)

Within the Tea Gardens, experiences are also directed. Vistas, focal points, and places of contemplation are offered as significant moments during the journey (Marcus & Barnes, 1999). These gardens represent a manifestation of change; a garden experience is presented as a process rather than a destination. This path prepares the mind for the tea ritual by using design techniques such as balance, subtle texture, muted colors, pleasing shapes, and appropriate scale to evoke a feeling of a wild and secluded location. This active space provided a calm environment for a walking meditation. Focus remains on stepping. Several concepts inform design in Taoist Tea Gardens: harmony (wa), balancing opposites; reverence (kei), keeping the gentle aspect of natural

rhythms; purity (sei), finding authenticity in natural texture and grain; tranquility (jaku), appreciating beauty of process (Winters, 1987).

Paradise, Cloister, and Monastic Gardens

Walled paradise, or cloister gardens, filled courtyards with fresh air, light, and greenery. Within the walled garden space, one could find protection. Surrounded by an arcade or colonnade, this space was found in early monastic communities and hospices. These gardens were contained within a circular or walled quadrilateral space. They sometimes contained a symbolic, evergreen or long-lived tree representing the “tree-of-life” (Gerlach-Spriggs et al., 2004). Cloister gardens seem readily applicable to a medical facility; however there are currently no known applications in a medical setting (Marcus & Barnes, 1999).



Figure 17: Cloister at Villa d'Este (Photo: Melissa N. Phalen)

Ecological and People-Oriented Design

Two additional garden approaches include the Ecological and People-Orientated. Both methods demonstrate an interaction between people and their environment. The Ecological Approach can foster a sense of gratitude, care, and concern for visitors. A well-maintained, sustainable design integrates the building and



Figure 18: Water-Energy Harvesting (Photo: Creative Commons)

outdoor environment by creating a system. This symbolic system conjures the message that place is interwoven with good health. Visitors become part of that healthy structure. The People-Oriented approach also relies upon an empathetic understanding of visitors' experience of ill-health (Marcus & Barnes, 1999). This approach is informed by the direct experience of the designer with the illness at hand. Design implications are based upon clinical treatments.

Healing Garden Design Typologies

Healing gardens take many forms. Although they range in scale and privacy, healthcare healing gardens can be designed to accommodate these forms. The following list describes a variety of garden locations and design considerations for the healthcare setting (Marcus & Barnes, 1999):

- Landscaped Grounds
- Landscaped Setbacks
- The Front Porch
- Entry Garden
- Courtyard
- Plaza
- Roof Garden
- Healing Garden
- Meditation Garden
- Viewing Garden
- Viewing/ Walk-in Garden
- A Tucked-away Garden
- Borrowed Landscape
- Nature Trails
- Atrium Garden

Symbolic Features

Mythic imagery awakens a powerful instrument of inner transformation (Davis, 2016). Sculptures and characters depicting mythology related to human condition and resonate on an

unconscious level. The cardinal directions have particular associations found in Christian symbolism and mythical landscapes (Gordon, 1971). The elements, earth, water, fire, air, and space have different associations. Animals have associations with character traits. Parts of the body, like a beating heart, have meaning exercised in healing rituals. Finally, archetypes such as serpents, the “Wounded Healer”, caves, and the tree-of-life represent common, universal themes (Davis, 2016; Jung, 2012). Imagery and archetypes persist and influence built forms.

Symbolism found in the labyrinth’s path, iconic sculpture, and garden layout recur through time. Mystical features and symbolic forms relay powerful messages and metaphors. The single, symbolic tree has significance in Paradise gardens and Eastern, Vedic beliefs. Before Dualism it is believed that heaven and Earth were one in a primordial mound, or stupa. After the split, an archetypal post now links heaven to Earth. Tree temples developed in Northern India and are revered as links between the physical and spiritual realms (Winters, 1987).

The mandala represents, in Tibetan Buddhist Tantra and Jungian depth psychology, a sacred enclosure, cosmic unity, psychic wholeness (Davis, 2016; Leidy & Thurman, 1997). Since Paleolithic times, it remains the oldest religious symbol of humanity representing healing the symbolic connection between the spiritual and physical worlds (Jung, 1972). Meditation focused on the mandala meant to relieve human suffering through spiritual awakening. This was achieved through contemplative



Figure 19: Mandala Graphic
(Image: Creative Commons)



Figure 20: Mandala Occurring in Nature
(Photo: Tavin Dotson on Unsplash)

methodologies. Natural forms and lines depicted nature. Mandalas have a geometric form. Because nature was sacred, gardens were not designed using geometric forms. Mandala gardens were designed to be looked upon and not inhabited (Winters, 1987).

In summary, the diagram below illustrates how therapeutic gardens address health and healing. Designed environments utilize theory from environmental psychology to understand how visitors behave, react, and feel in a setting. Layered upon that information, designers retrieve solutions found in healthcare precedents, typologies, and programs chosen specifically to suit the design problem. The diagram can also help a medical facility analyze how beneficial environments can be retrofitted in an existing site.

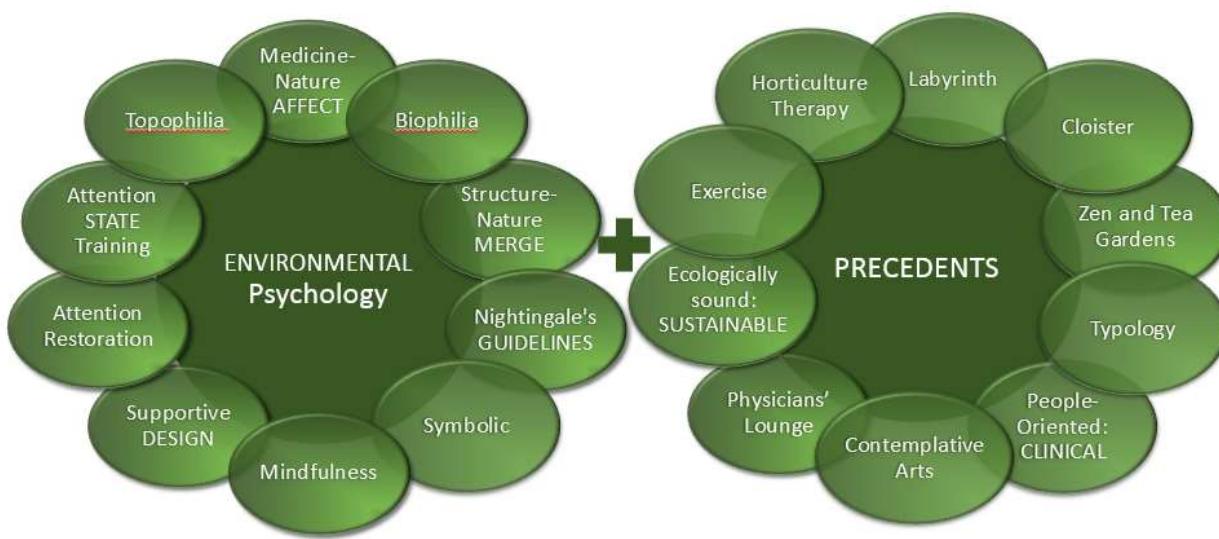


Figure 21: Resilience through Environmental Design, Concept Diagram

TREATMENT: MINDFULNESS-BASED STRESS REDUCTION

“Intervention could enhance opportunity for restoration.” (Hartig, 2007, p. 580)

When experiencing a crisis due to burnout, a sensory experience in a healing garden may not be enough to shake one’s psychological and physiological experience. In thrall due to a heightened emotional state, distressed physicians may physically arrive to a healing garden; yet, they may not have the ability or self-direction to capture a restorative, wholesome, and humanizing experience. Individuals with limited resources especially lack the ability to restore their psychological capacity for compassion.

Mindfulness restores compassion. The mindful process begins by allowing the present moment to unfold while directing an honest quality of attention to the present experience (Kabat-Zinn, 2002). Physicians, administration, and educators recognize the value that mindfulness brings to the medical setting (M. Epstein, 2013; R. M. Epstein & Privitera, 2016). Practicing mindful techniques helps staff and physicians cope with work-related stress and traumatic events (Ludwig & Kabat-Zinn, 2008).

Classical Mindfulness

Classical mindfulness comes from a 2,500-year-old contemplative practice of Buddhist Vipassana meditation. The Four Noble Truths of *suffering*, its *cause*, its *relief*, and *path* to enlightenment form Buddhist, spiritual practice (M. Epstein, 2013). Mindfulness is a *dharma*, or “the path” toward wholeness and harmony (Kabat-Zinn, 2003). Before becoming “mindful”, one must understand the Buddhist principle of *dukkha*, or “suffering.” Suffering occurs when

attachments are not recognized, accepted, regulated, challenged, or severed (Siegel et al., 2009). Practice does not seek to withdraw from a situation by escaping distress or disregarding emotion. Rather, it is described as a method to engage difficult feelings with “attentional control.” (Teasdale, Segal, & Williams, 1995, p. 27)

The term “mindfulness” means “awareness”, “attention”, and “remembering” to observe how the mind creates suffering through beliefs, preconceptions, feelings, behaviors, reactions, and attachments (Siegel et al., 2009). As described in the previously, the mindful pupil approaches a moment with a patient, open, aware, and curious attitude. By withholding judgement and letting go of preconceptions, one learns to accept the reality of the moment (Bishop et al., 2004; Kabat-Zinn, 1990b).

Seigel, Germer, and Olendzki explain that every human experience is constructed from “6-doors” that hear, smell, taste, feel with the body, and feel with the mind (2009). This raw data is explored and processed as primary information. Processes beyond these six doors occur in five primary systems: material, consciousness; perception, feeling, and formations. The research illustrates that the “6-sense doors are interacting simultaneously in mind-body process constructing meaning out of a barrage of information.” (Siegel et al., 2009, p. 31) Additionally, neuroscientists have found that attentional control over limited cognitive resources, accurate processing, and how a stimulus is perceived is improved by Vipassana meditation (Slagter et al., 2007). Mindfulness



Figure 22: Buddhist Monk, Walking Meditation (Photo: Creative Commons)

takes control of cognitive processes through the following course: identify-modify-reduce (Rapgay & Bystrisky, 2009). A mindful, meditative practice aims to complete the following goals (Kabat-Zinn, 1990b; Rapgay & Bystrisky, 2009):

IDENTIFY

- Focused, directed attention on present moment (develops stability)
- Introspective awareness (*attitude*= patient, open, curious, non-judgmental, and accepting *presence*= tender, openhearted, affectionate, compassionate, and friendly)
- Exposure; Observe what caused feelings (confronts difficulty rather than ignoring it)

MODIFY

- Quiet stillness (to recognize stressor, trigger, preconception, beliefs, and values)
- Labeling feelings (separates process from content)

REDUCE

- Perceptual and cognitive regulation (allows for tolerance, flexibility and change in habit)

Although it has many similarities to Buddhist mindful practices, Western mindfulness has been criticized by Bhikkhu Bodhi as “McMindfulness” or a “watering down” version of Buddhist psychology (Rosenbaum & Magid, 2016, p. 75). Both seek to relieve suffering by contemplating on body, feelings, and mind through an awareness of present experience (Rapgay & Bystrisky, 2009; Siegel et al., 2009). Typically, however, Western mindfulness removes the spiritual practice from its religious foundation and focuses upon the concepts of “nonjudgement”, “acceptance”, and “compassion” (Siegel et al., 2009, p. 19). Hozan Alan Senauke points out that the Mindfulness-Based Stress Reduction (MBSR) program, however, is based on authentic Buddhist tradition and

requires daily training and meditation. (Rosenbaum & Magid, 2016, p. 73) Mindfulness is not a trend, it is a way of life.

Mindfulness-Based Stress Reduction (MBSR)

In the 1980's, Jon Kabat-Zinn, a psychologist at the University of Massachusetts Medical School pioneered the 8-week, cognitive behavior, training program called Mindfulness-Based Stress Reduction (MBSR) (Kabat-Zinn, 1990b). Relying upon his personal experience practicing Buddhist meditation, Kabat-Zinn developed the course to help patients cope with stress, illness, and pain (Kabat-Zinn, 2003). Mindfulness meditation requires daily training using controlled breathing, sitting meditations, walking meditations, controlled movements, and body scans as methods for positive cognitive change (Kabat-Zinn, 1990a; Krasner et al., 2009).

Mindfulness-Based Stress Reduction specifically targets stress. It provides a regimen of the following practices: didactic instruction, meditation, controlled movement, and group process. In regard to institutional responsibilities, arming physicians with training, guidance, and resources such as a dedicated place to practice could allow physician to incorporate mindful reflection into their daily work routine.

Didactic Instruction

Coping strategies for burnout can be taught (Koeske, Kirk, & Koeske, 1993). The Mindfulness-Based Stress Reduction program begins with a short (15-minute) didactic presentation. The presentation instructs about the importance of “breath”, the value of and methods for obtaining mindful attention (Kabat-Zinn, 1990a). The quality of attention is highlighted as well. The presentation describes mindfulness as a secular method that allows the consciousness to face

problems while sustaining a positive, kind, gentle, loving, forgiving, and compassionate response (Chopra, 2010; Kabat-Zinn & Hanh, 2009).

Meditation

Meditation “opens understanding”, which is the key to awareness of thoughts and feelings (Kabat-Zinn, 2002). When tense, stressed, or in emotional pain, muscles contract impeding the diaphragm and causing lungs to draw shallow breaths. A lack of oxygen increases the body’s stress reaction. Focusing on the breath and the in-and-out rhythm of breathing, opens the chest. Controlled breathing puts the body at ease and in a state ready for meditation.

Sitting meditation, or “zazen”, has demonstrated effects on the body and mind (Kasamatsu & Hirai, 1966). Health care providers have used medication as a method to reflect upon perceptual bias, dealing with unpleasant events, managing conflict, preventing burnout, reflecting on meaningful experiences in practice, setting boundaries, examining attraction to patients, exploring self-care, being with suffering, and examining end-of-life-care (Krasner et al., 2009). By attending to each region of the body, body scans are also used to process physical experiences by joining and reconnecting the mind and body. These meditation techniques require time to move through



Figure 23: Zazen, Sitting Meditation (Photo: Kosal Ley on Unsplash)



Figure 24: Body Scan Meditation (Photo: Creative Commons)

the mindful process of attending to the present moment and regulating emotion.

Attend: Sustained, Focused Attention

“Attention” is the most basic level of alertness. To remain present in the moment, “attending” requires practice. Preconceptions, evaluations, values, and automatic reactions make it difficult to sustain and shift attention as needed (Bargh & Chartrand, 1999). Awareness of moment-to-moment experiences leads to behavioral regulation (Brown, Ryan, & Creswell, 2007). Focused attention can help cultivate well-being through consistent practice.

Observe: Compassion, Curiosity, Openness

Mark Epstein, a psychiatrist, observes that, “Trauma is an indivisible part of life used as a lever for growth and an even deeper understanding of change. Meditation is not distancing, but a way to connect.” (M. Epstein, 2013, p. 27) Epstein goes on to describe the “observational posture” required to sustain a mindful practice as having the “absence of reactivity” (2013). To be mindful includes this open posture. The term “mindful” is related to the place on the body where Easterners locate the heart. Therefore, “mindfulness” also assumes a tender, openhearted, affectionate, compassionate, and friendly presence (Kabat-Zinn, 2003).

Reduce: Elements of Cognitive Therapy

Cognitive therapy describes the ability to gain insight and construct new reactions in response to a familiar stimulus. A mindfulness-based program applies an ancient, cognitive therapy to modern struggles. Mindfulness is a self-discipline that requires commitment and perseverance (Kabat-Zinn, 1990b). Practicing mindful meditation leads to a better awareness concerning the sources and triggers of mal-adaptive emotional and behavioral patterns. This process leads to gains in personal and professional insight (Ronald M. Epstein, 1999; Kabat-Zinn, 2009).

Figurative language has been used to teach mindfulness (Varra, Drossel, & Hayes, 2009).

Metaphor, similes, analogies, and allegories, whether conceptual or creative help define correct, mindful practice. For example, describing the mind as a mirror, which reflects, contains, encounters, helps beginners understand concept such as “absence of reactivity.” (Kabat-Zinn, 2002, p. 71)

Controlled Movement

Western psychotherapy stems from Sigmund Freud’s “talking-cure”, which reinforces the dualistic nature of the mind-body healing process. According to Susan Lesley Woods, “Body awareness is the *first foundation* of mindfulness.” (Woods, 2009, p. 463) Mindful meditation includes the practice of controlled movements like walking meditations, yoga, Tai Chi, and mindful eating. Because of its roots in Eastern paradigm, it becomes important to remember that the mind and body are one unit. Epstein explains that “Trauma encodes itself on body and mind.” (M. Epstein, 2013, p. 148) Physical experience of trauma is captured and converted into the physical body, memory, and spirit. Mindfulness meditation seeks to attend to, observe, and release memories of trauma, stress, and distressing emotions.

Walking Meditation

The practice of walking meditation melds meditation with physical activity.



Figure 25: Controlled Movement Meditation (Photo: Creative Commons)



Figure 26: Walking Meditation (Photo: Creative Commons)

Walking becomes part of the experience of meditation. Attention, rather than focused upon the breath, rests upon only one aspect of the practice: correct posture, the sensations in the feet, the transfer of weight, adjustments to balance, or the bi-lateral motion (Kabat-Zinn, 1990b). This method also requires a curious moment-to-moment awareness of the experience as though it were new.

Hatha Yoga

Yoga, “yoke”, or “union”, is a practice of integrating the mind, body, and spirit (Filliozat, 1991). It is a contemplative physical and spiritual practice of ancient India that has been practiced in the West to promote wellness and reduce stress (Granath, Ingvarsson, von Thiele, & Lundberg, 2006; Khalsa, 2007; Salmon, Lush, Jablonski, & Sephton, 2009). Practitioners seek to restore normative bodily functions that become disrupted during periods of stress, and strengthens muscles effected by “disuse atrophy” (Kabat-Zinn, 1990b, p. 99). In response to a conference presentation highlighting the benefits that yoga has upon Post Traumatic Stress Disorder (PTSD), Salmon, Lush, Jablonski, & Sephton state,

“He presented compelling evidence that regulation of physical movement is a fundamental priority of the nervous system, perhaps from an evolutionary standpoint even more important than regulation of emotional functions. Physical therapies may benefit from ‘pre-wiring’ that augments



Figure 27: Yoga Practice in Nature (Photo: Creative Commons)

their impact on patterns of behavioral reactivity commonly associated with various clinical conditions.” (Salmon et al., 2009)

MBSR practice includes physical movements with programmatic breathing exercises (Kabat-Zinn & Hanh, 2009). Kabat-Zinn recommends starting with a warm-up, then progressing through a series of poses; counter poses; dynamic movement; and sitting, static, prone, supine poses (Kabat-Zinn, 1990b). There are forward bends, backward bends, side twists, lateral (side) flexion, and axial (lengthen spine) extensions. During practice, students focus on the present moment process; the breath, as anchor; postural alignment; and maintaining a continuous flow of energy (chi) (Kabat-Zinn, 1990b; La Forge, 2005).

Benefits of Mindfulness Practice

The Mindfulness-Based Stress Reduction program improves psychological health by reducing perceived suffering associated with stress and by providing participants with tools to manage future reactions to stressors (Baer, 2003; Carmody & Baer, 2008; Keng, Smoski, & Robins, 2011). Through didactic instruction and active practice, participants learn mindfulness meditation, cognitive therapy, Hatha yoga, and group process over an 8-week course. Participants are required to practice on-their-own, 45 minutes daily for six-days per-week to experience cognitive changes (Kabat-Zinn, 1990b).

Kabat-Zinn’s MBSR program has demonstrated clinical success treating stress; chronic pain; depression; reducing blood pressure and cortisol levels; increasing immunity; and alleviating depression and anxiety (Carlson, Speca, Faris, & Patel, 2007; Davidson et al., 2003; Hofmann, Sawyer, Witt, & Oh, 2010; Kabat-Zinn & Hanh, 2009; Lengacher et al., 2012; Tacón et al., 2004; Teasdale et al., 1995). Furthermore, continued practice increases benefits over time (Carlson et al.,

2007). Because the program fuses multiple practices, it is difficult for researchers to access if mindfulness meditation, alone, is the programmatic factor that promotes psychological well-being (Rosenbaum & Magid, 2016). Regardless, the MBSR program has been clinically shown to yield positive outcomes specifically for physicians suffering burnout (Irving et al., 2014; Regehr et al., 2014; Shapiro et al., 2005). Physician improvements also includes increased empathy associated with better patient-centered care (Krasner et al., 2009).

Practicing mindfulness beneficially changes the brain's structure. Technological advancements in neuroimaging help scientists detect neurogenesis, the brain's plasticity, which allows continued development, adjustment, and adaptation throughout adulthood. The hippocampus sustains neurogenesis and plays a part in the emotional-response system. Stress, however, causes the adrenal glands to produce cortisol. Cortisol kills cells in the hippocampus, therefore reducing the capability of producing adaptive, emotional regulation (Davidson, Jackson, & Kalin, 2000). Mindful meditation beneficially changes brain function by reducing stress and preserving neurogenesis in the affective regulatory center of the brain (Davidson et al., 2003).

Mindfulness-Based Stress Reduction provides a meditative strategy to produce a shift from responding with the emotionally reactive, “fight-or-flight”, amygdala to responding with the reappraisal-focused, emotional regulatory, parietal cortex (Kalisch, 2009). Mindfulness meditation opens neuropathways in the frontal cortex, which correlate with high-order, cognitive functions, positive feelings, and perceived well-being (Baer, 2003; Hölzel et al., 2011). MBSR causes “left-side anterior activation” demonstrating beneficial, coping mechanisms in response to emotional stress (Davidson et al., 2003).

The “Mindful” Physician

Physicians and medical educators recommend adopting a mindful-medical practice (M. Epstein, 2013; Ludwig & Kabat-Zinn, 2008; Shapiro, Schwartz, & Bonner, 1998). Echoes of the Hippocratic Oath can be heard in a physician’s consideration of mindful, medical care, which suggests that “self-knowledge is essential to the expression of core values in medicine, such as empathy, compassion, and altruism...” (Feinstein, 1994, p. 843) With ideologies similar in nature to those found in mindfulness-based meditation Ronald Epstein, a physician, suggests the following traits of a mindful physician (1999, p. 835):

- Active observation of oneself, the patient, and the problem
- Peripheral vision
- Preattentive processing
- Critical curiosity
- Courage to see the world as it is rather than as one would have it be
- Willingness to examine and set aside categories and prejudices
- Adoption of a beginner’s mind
- Humility to tolerate awareness of one’s areas of incompetence
- Connection between the knower and the known
- Compassion based on insight
- Presence

Similarities between the description of a “mindful physician” and “mindfulness” as described in Rapgay and Bystrisky’s work can be found (2009). First, both rely on the first

principle, “observe”. Active observation, peripheral vision, and preattentive processing can be included in this category. Second, rather than seeking to modify behaviors, Epstein suggests “strengthening” critical curiosity, courage, willingness, humility, connection, compassion, and usage of a beginners mind. Finally, instead of reducing behaviors, Epstein frames the goal of mindful practice as “increasing” presence. Ideally, a mindful physician actively practices the following virtues: presence, reflection, self-awareness, courage, empathy, compassion, connection, curiosity, flexibility, open-minded (a “beginners mind”), non-judgmental, modesty, patience, wisdom, and moment-to-moment awareness. Mindfulness builds emotional intelligence by integrating rational and emotional aspects of the human experience (Freshwater & Stickley, 2004). Through mindfulness practice, one develops the ability to reflect. “Reflection” opens an individual up to reprisal as suggested by Hobfoll in the Conservation of Resources Theory (1989).

As seen in the diagram below, not only do individuals need to adopt a steady mindfulness practice, but they also require an environment conducive to facilitate that practice. Environments, which peacefully stimulate the senses and allow room for movement are necessary. This diagram can also help analyze how well an existing facility accommodates mindfulness-based practices.

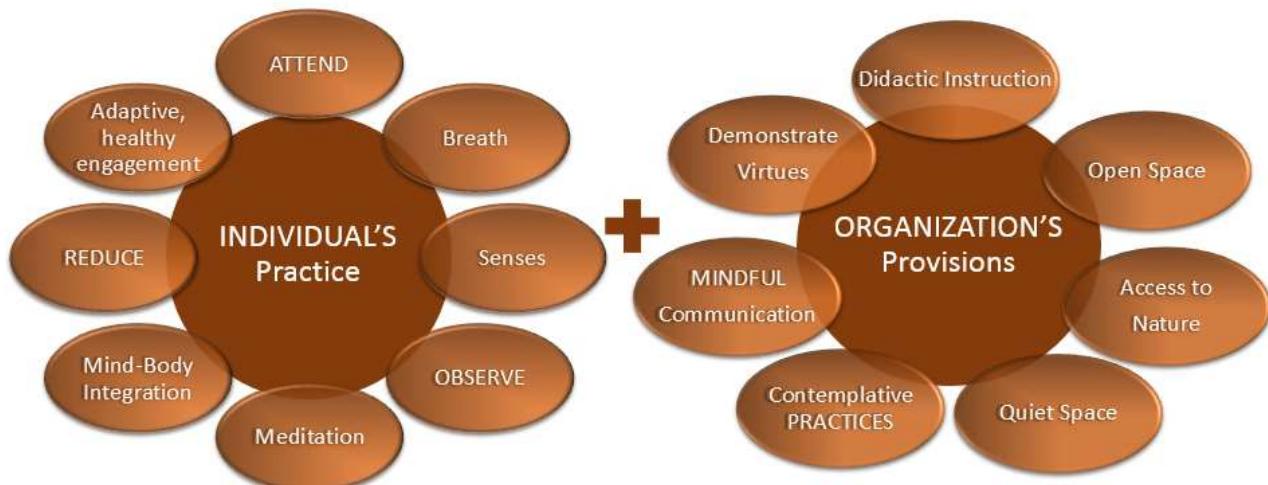


Figure 28: Resilience through Mindfulness-Based Stress Reduction, Concept Diagram

DISCUSSION: A BUNKER GARDEN

“A famous Zen saying is, ‘when venomous snake drinks water, it becomes poison. When cow drinks water it becomes milk’. This suggests that whether the garden becomes poison or milk is dependent on the creator.” (Masuno, 2016)

Whether an environment becomes poisonous or nourishing depends upon the “intention”. The responsibility rest upon designers and healthcare administrators to conceptualize therapeutic gardens while addressing the ongoing medical crisis. Designers must open their toolbox, which includes design theory, precedents, and typologies then combine these design solutions with a program that currently supports physicians coping with burnout, Mindfulness-Based Stress Reduction. Only when these therapeutic solutions marry, will therapeutic gardens have an opportunity to prove a successful method of treating physician burnout. The following discussion will focus upon therapeutic design interventions, relationships between the MBSR program, and design guidelines for physicians suffering burnout.



Figure 29: Bunker Garden Concept Diagram

Restorative garden design recommendations propose approaches, activities, and design elements that have long been used in mindful meditation practices. For example, a labyrinth, encourages visitors to practice walking meditations. Benches offer repose for sitting meditations. Active water and wildlife offer distractions to a ruminating mind. Designers with good intentions toward visitors to a healing, restorative garden may inadvertently overlook the importance of preparing visitors for a therapeutic process. Currently, gardens in medical settings provide physicians with space and elements needed for an effective mindfulness practice. Restorative gardens that are designed with awareness of MBSR program could help facilitate the healing process.

Therapeutic Garden Design Interventions for Wellness

Medical facilities exist as a complex system. General hospitals and medical campuses provide a service and sustain a workforce. Healthcare facilities prioritize the healing process: exam, diagnosis, and treatment of illness and disease. Depending on the scale of treatment and size of community, designers and administration conceptualize a place for healing within an efficient structure including ward specialties, technology, laboratories, and clinics. Challenges face designers while organizing the many functions and constituents (Zube & Moore, 1989).

Before design, landscape architects need to rely upon their research skills. Having practice in survey techniques, interview formats, and gathering background information on the site and visitors will make a more fine-tuned garden design. Engaging with the service provider, administrators, maintenance crews, physicians, and staff will help facilitate a better design solution.

Designers and administrators must recognize that not all facilities have access to an inherently tranquil setting, open wilderness, or unlimited space. Site design comes with basic issues and constraints. When considering how to include “nature” in healthcare settings, creative approaches may be necessary. For example, water, vegetation, and habitat represent life and the life cycles. Through creative composition or by utilizing abstract forms, these elements of nature can be inferred. Whether manufactured or real, pocket-scaled or estate-sized, “nature” supports wellbeing, and offers positive distraction.

While considering how to evoke natural environments and cultural representations, it is important to recognize that symbolism and meaning are highly personal concepts. The smallest, natural relief could make a large psychological impact. An individual’s past experiences, values, and worldviews filter subjective understanding as



Figure 31: Awe-Inspiring View (Photo: Pete Wright on Unsplash)



Figure 30: Indoor Tree (Photo: Chris Barbalis)



Figure 32: Indoor Potted Plant (Photo: Creative Commons)

a perception. Research suggests that emotions affect perception. Emotional Congruence Theory suggests that personal characteristics, lived experiences, emotions, fears, and levels of stress affect how environments are processed (Niedenthal & Setterlund, 1994). Furthermore, design educators emphasize "... how people see their environment, and how they react to it, is the most critical component of therapeutic design." (Marcus & Barnes, 1995, p. 88) Designers must enter a design process with sensitivity and compassion to emotional experiences of the client and visitors (Marcus & Sachs, 2014). Representational art and "ambiguously positive" symbolism are recommended (Ittelson, 1974; Marcus & Barnes, 1995; Roger S Ulrich, 1999).

Relationships between MBSR and Healing Garden Design Theory

The design of an outdoor, bunker garden could rely successfully upon existing healthcare design research aimed to restore individuals from stress. However, recent research touts the benefits of Mindfulness-Based Stress Reduction (MBSR) as a cognitive therapy program designed by a physician, widely implemented, and clinically proven as a method to help physicians cope with burnout specifically. By pinpointing this working solution, this thesis now explores relationships between healing landscapes and MBSR.

Nature, nature experiences, healing gardens, and mindfulness

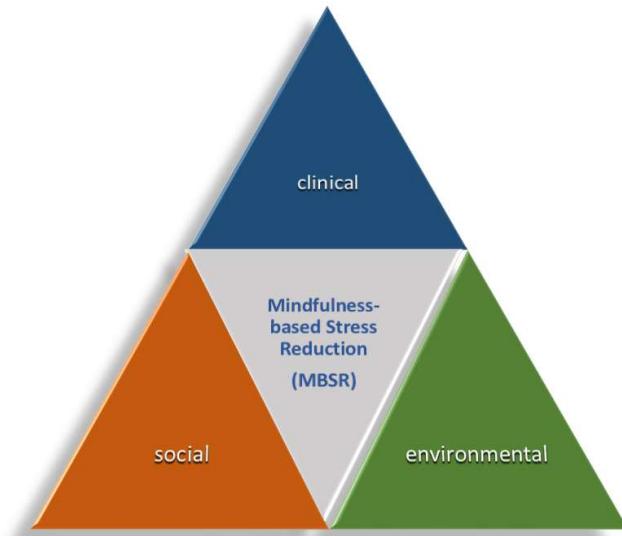


Figure 33: Mindfulness-Based Landscape Design, Concept Diagram

literature have positive associations. By plotting their characteristics, relationships can be understood. The following table presents the conceptual design framework for a physicians' bunker garden:

Table 1: Relationships among Nature, Nature Experiences, Mindfulness Design, and Spirituality

NATURE	EXPERIENCE	Mindfulness-Based Habitat	SPIRIT
Biology/Topology	Affective	Humanistic	Metaphysic
matter; sunlight; water; air; earth; fire; space; life-cycles; plants; animals; minerals; pleasant distraction; chaotic patterns; courses; electromagnetic forces; quantum mechanics; chemical reactions; life; food; water; shelter	Biophilic; topophilic; sensory; physical; spatial; hear, taste, see, smell; physical touch; emotions; feelings; psychology; nurture social; restorative; attentive	Private; safe, socially unguarded; reflective; conscious; subconscious; material; meaningful; symbolic; perception; distraction; community; communication; formations; restorative cultural expression; hospitable	attention; energy; chi; harmonious; balanced; beauty; open; introspective; abstract; insightful; sacred journey; wholeness; monism; faith; belief; knowing dreams; mental state
<i>essential</i>	<i>gained</i>	<i>habitat</i>	<i>transcendence</i>
immediate relief; sustained over time	temporary; disappearing	strengthens meta-cognition; cultivates adaptive responses; form	connection to life-force; permanent
Nature	Sensory	Culture	Spirit
Reptilian Brain: instinctive; automatic, rigid, compulsive	Emotional Brain: Feeling; sensing; intuitive; caring; attached; expressive; compassionate; empathetic; connected; attention	Neocortex: executive attention; coping; adaptation; regulation; learning; creativity; problem-solving; story-telling present moment;	Consciousness: unknown
<i>basic</i>	<i>(experience)</i>	<i>intermediate</i>	<i>advanced</i>
REACT	MONITOR	RECENTER	TRANSCEND

Design Principles

Mindfulness-Based Stress Reduction (MBSR) provides a therapeutic process, which can guide designers, administrators, and physicians to therapeutic experiences in an outdoor settings. To make tangible these abstract descriptions of landscape design found in the previous descriptions, the following illustrates how a therapeutic landscape design may foster a MBSR program. General guidelines will help illustrate how to achieve a “bunker garden”.

Therapeutic garden design may materialize from traditional healing garden approaches. The labyrinth, Japanese Zen, Tea, paradise, cloister, and monastery gardens all have value and have served the healing process through history. Additionally, ecological, sustainable and medicinal garden design have symbolic value as well. The people-oriented approach may be employed if designers and administrators have a particular sensitivity to the plight of physicians and their struggle with burnout.

General Guidelines

Nature generates positive emotions (Mayer et al., 2009). Nature may restore self-control resources (S. Kaplan & Berman, 2010). Connection with outdoor environments increases wellness, happiness, and cognitive capacity (Berman et al., 2008; Capaldi et al., 2014; Weinstein et al., 2009).

Designers and their healthcare clients need to be aware of such stress-reducing benefits of natural outdoor environments (Marcus & Sachs, 2014). Furthermore, several sources list design recommendations for healing gardens in medical settings. Some evidence-based guidelines, such as



Figure 34: Outdoor Landscape offering Refuge (Photo: Creative Commons)

those listed by Marcus and Barnes were conceived for the general public. These general guidelines follow (Marcus & Barnes, 1999, p. 157):

- Set outdoors and away from sterile indoor environment
- Variety of visual interest including color, seasonal variety, mutable
- A sense of care, time, and permanence: sustainable design, memorials, quotes for encouragement, old trees
- Soft white noise
- Habitat for wildlife
- Levels of social interaction from open to private
- Movable seating to allow for comfort, choice, and protection from weather
- Comfortable: no excessive heat, glare, human scale, shade, ergonomic seating, sense of familiarity



Figure 35: Spring Garden with Visual Interest
(Photo: Creative Commons)

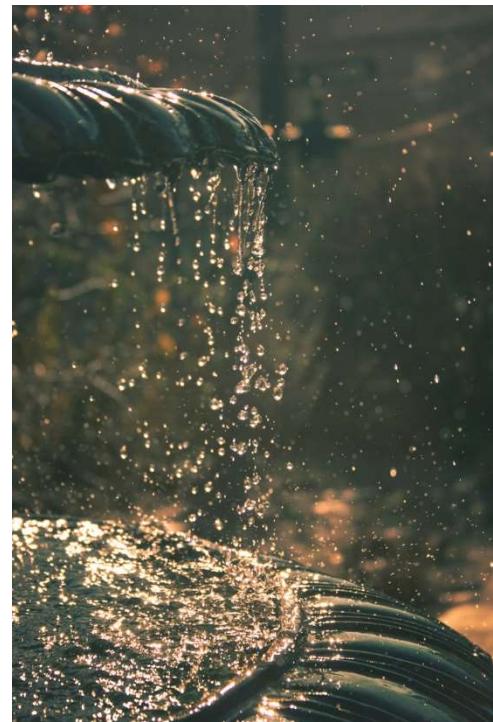


Figure 36: Fountain making White Noise
(Photo: John Wilson on Unsplash)

It is recommended to help alleviate staffs' perceived stress and provide a private retreat. Considering physicians and staff during the design phase demonstrates the organization's

gratitude, care, and consideration (Healy, 1986). Additional recommendations for medical staff include the following (Marcus & Barnes, 1999, p. 541):

- Comfortable lounge, patio, or private garden
- Semi-private retreat (i.e., a staff spa and changing room)
- Set away from building, patients, and visitors
- Demonstration of value placed on staff
- Provisions to cope with a personal sense of loss



Figure 37: Private Retreat for Physicians (Photo: Dmitry Kotov)

It is especially beneficial for workplaces to include natural features as part of the environment. Providing employees with access to nature, which features elements necessary for a restorative experience, helps restore directed attention and improves job satisfaction and productivity (R. Kaplan, 1993). These, sensory and aesthetically pleasing environments reduce stress (Hartig, 1993; Roger S. Ulrich et al., 1991). Visitors to healing gardens receive spiritual, physical, and emotional benefits and report a restored a sense of well-being (S. Kaplan, 1995; Marcus & Barnes, 1995; Roger S Ulrich & Parsons, 1992; Ward Thompson, 2011). Visitors describe positive associations with green foliage, flowers, peaceful water, and the sights and sounds wildlife such as butterflies and birds (Roger S Ulrich, 1999). Additionally, restorative experiences must be comfortable and void of glare; excessive temperatures and humidity; loud noises; and poor air quality (Rashid & Zimring, 2008).



Figure 38: Yellow Finch visiting Cosmos
(Photo: Ray Hennessy on Unsplash)



Figure 39: Window View of Outdoor Landscape (Photo: Scott Webb on Unsplash)

Developing Sustained Attention

“Attention” becomes essential ingredient for self-regulation and stress management (S. Kaplan, 2001; Y. Y. Tang et al., 2015). Students, beginning mindful meditation, confront difficulties cultivating stability of mind and body (Siegel et al., 2009). This challenge appears as the primary hurdle to maintaining a mindful meditative practice (Rapgay & Bystrisky, 2009). Directing attention involves a considerable amount of effort and skill (Cohen, 2013). Difficulties emerge executing control over conflicting inner dialogue and well-established patterns of the stress-reaction responses. Avoiding and overcoming a distraction is, in itself, stress inducing (S. Kaplan & Berman, 2010). This effort feels especially taxing to beginning practitioners, and causes little motivation to continue a meditative practice (Kabat-Zinn, 1990a). Restoration in natural environments, however, entails an effortless type of attention (S. Kaplan, 1995).

Attention State Training (AST) opens awareness to a new state that appreciates the mind-body and culture-nature relationships. Attention Restoration Theory (ART) considers the elements of a restorative nature experience that can help transform mental states. Since AST and ART relate to each other, they have been placed together as complements in this discussion.

Contemplative practices, which are categorized by degrees of communication/ connection and awareness, are associated with healing and stress reduction. Meaning may emerge under many circumstances while practicing. When contemplative practices are completed in an outdoor environment, the wellness benefits increase. Providing ample space and a variety of contemplative activities will motivate individuals to regularly visit and use a therapeutic space. While in the schematic design phase it is important to consider a list of contemplative practices. Several practices may be chosen for permanent design. Other contemplative practices may be rotated on a

seasonal schedule. Still other contemplative practices may be chosen by an individual and practiced in a flexible, accommodating space.

Attention Restoration Theory

Attention restoration can occur in a variety of environments. A variety of scales, materials, and environments can help foster restoration. The following list describes how healthcare healing gardens may provide a restorative experience.

- Soft fascination
- Being away
- Extent (coherence and richness of environment)
- Emotional compatibility



Figure 40: Butterfly Brings Distraction & Attention Restoration (Photo: Gary Bendig on Unsplash)

Attention State Training

Attention State Training can occur in a variety of environments. If selecting a contemplative practice, then the environment must be conducive for the activity. Movement requires ample space. Materials must remain comfortable. Design should express a welcoming atmosphere for participants. A soothing, balanced, and harmonious ambiance is recommended. At times, signage may be required to encourage participation or quiet incoming visitors, who may have inadvertently walked into an active session. Above all, this environment would be useful for to facilitate active, meditative programs like yoga. The following describes the foundations of Attention State Training:

- Practice in natural environment
- Mindful meditation
- Formal, integrative body-mind training: yoga and tai chi

Contemplative practices. Contemplative practices have existed through time as a method of “knowing and focused attention” (Fort, 2013, p. 23). Practicing contemplation strengthens a mindful physician (Santorelli, 2007). The following list provides activities, which support contemplation (Duerr, 2015):



Figure 41: Walking Meditation in the Rain (Photo: Stephen Arnold on Unsplash)

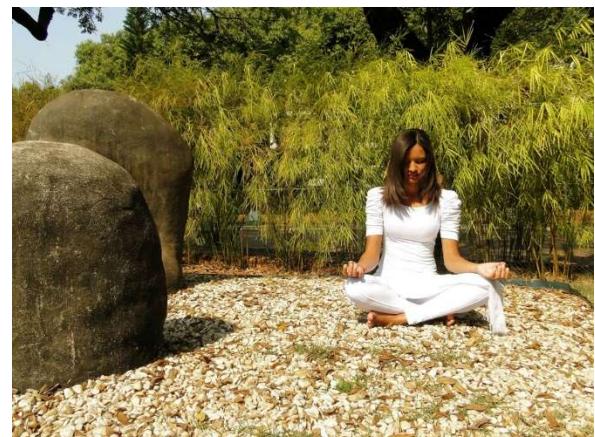


Figure 42: Rock Garden Sitting Meditation (Photo: Creative Commons)

STILLNESS

meditation, quieting the mind,
centering, silence

GENERATIVE

Lectio Divine, visualization,
beholding, loving-kindness
meditation

CREATIVE

arts, improvisation, journaling,
music/singing



Citations from Left to Right:

Figure 43: Stillness, Rock-Balancing (Photo: Andrik Langfield on Unsplash)

Figure 44: Generative, Loving-Kindness Meditation (Photo: Eepeng Cheong on Unsplash)

Figure 45: Creative Painting (Photo: Nik McMillian on Unsplash)

ACTIVIST

pilgrimage to areas where social justice issues are highlighted, work and volunteering, vigils and marches, bearing witness



RELATIONAL

council circle, dialogue, deep breathing, storytelling



MOVEMENT

walking meditation, labyrinth walking, yoga, dance, Aikido, Tai Chi, Qigong



Captions from Left to Right:

Figure 46: Activist, Volunteering Harvest to Food Banks (Photo: Creative Commons)

Figure 47: Relational, Prayer Flags, Used as Storytelling Effort (Photo: Creative Commons)

Figure 48: Movement, Labyrinth Meditation (Photo: Creative Commons)

Additional suggestions based on the MBSR Program. Since practice as a mindful physician requires “reflection” and “social connection”, additional design programs are required to sustain physician well-being. For physician’s individual benefit “Interactive design” is offered as an expressive outlet. For the organization’s benefit, “Opportunities to play” is offered as an opportunity to further develop social relationships. The Mindfulness-Based Landscape Design include the following:

RITUAL - CYCLICAL	PLAY	INTERACTIVE
establishing a sacred/personal space, rituals, spiritual/cultural ceremony	games, problem-solving, team activities	build, modify, create, transfer, hold , throw, write

Captions from Left to Right:

Figure 49: Ritual, Finding a Sacred Space (Photo: Creative Commons)

Figure 50: Play, Climbing Activity (Photo: Creative Commons)

Figure 51: Interactive, Ringing the Mindfulness Bell (Photo: Igor Ovsyannykov on Unsplash)

Clinical Solutions in Mindfulness-Based Landscape Design

Much of the previously mentioned research relates to preserving or improving physicians' mental health in regard to the emotional exhaustion component of burnout. Design considerations including physical, social, and spiritual benefits, can promote stress reduction and improve mental health. Administrators and designers can remain cognizant of physicians' psychological needs during the conceptual and programmatic design phases by referring to *Table 2: Therapeutic Garden Design Solutions to Improve Physicians' Mental Health.*

Table 2 outlines the design implications for healing garden design that considers mental health of physicians in the workplace. Two phases of design are considered: conceptual and programmatic. Conceptual and programmatic phases have specific considerations. Each design phase includes both active and passive engagement. The following list provides a set of design

recommendations, which consider how a physician may address psychological health and self-care through mindful engagement:

Table 2: Therapeutic Garden Design Solutions to Improve Physicians' Mental Health

THERAPEUTIC DESIGN	ACTIVE ENGAGEMENT	PASSIVE ENGAGEMENT
CONCEPTUAL	Access outdoor landscape Physical activity Contemplative practices	Restore directed attention Restore compassion fatigue
Special Considerations	<i>Privacy; accessibility; security; comfort; safety</i>	
PROGRAMATIC	Express emotions Engage with elements on site Access to food and water Practice spiritual tradition Communicate Reflect (introspection) Cultivate meaning	View out window Real nature Aesthetic appreciation
Special Considerations	<i>Avoid: glare, excessive temperatures/humidity; loud/ unnecessary noises; excessive concrete/hardscape</i> <i>Include: natural ventilation, choice in seating location, and levels of sun exposure</i>	

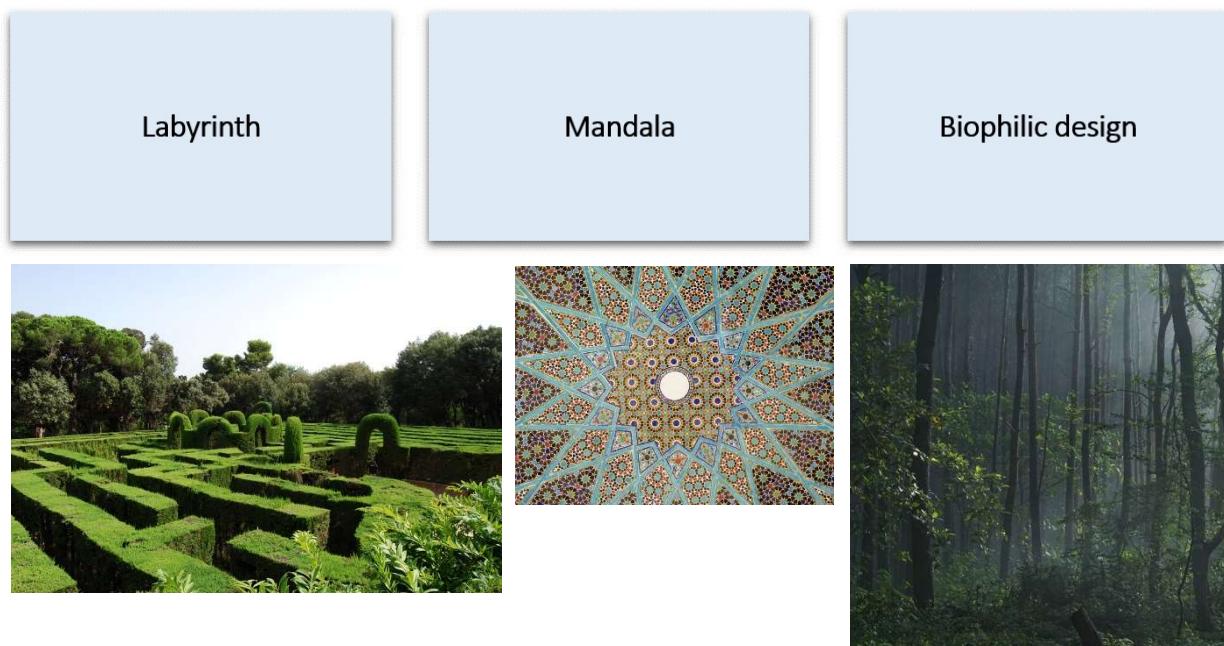
The conceptual design phase should include the following considerations for active engagement: an accessible outdoor landscape, provisions for physical activity, and space for contemplative activities. Opportunities for passive engagement should address restoring both compassion fatigue and directed attention. Privacy, accessibility, security, comfort, and safety are special conceptual considerations.

Programs, offered within therapeutic gardens, give physicians an opportunity to actively engage in the following choice outlets: expressing emotions, engaging in positive mental activities, access to food and water, practicing spiritual traditions, communicating, reflecting (introspection), and cultivating meaning. Additionally, physicians need passive engagement opportunities that can be gained by a window view, scenes of real nature, and an aesthetic environment. Special

considerations in the programmatic phase of design include avoiding glare; excessive temperatures/humidity; loud/ unnecessary noises; and excessive concrete/hardscape. It is important to ensure natural ventilation and include opportunities for physicians to choose seating location and levels of sun exposure.

Symbolic features.

Symbolism and metaphor help a garden visitor construct meaning out of their experience and improve clinical affectiveness of landscape design. “Ambiguously positive” imagery supports the emotional congruence theory (Marcus & Barnes, 1999). Other elements like water, habitat, animals, sculpture, and natural forms can develop metaphors in the design. Biophilic design patterns and topophilic design patterns could offer interest and a deep, subconscious connection to the landscape. Because these symbolic and affective elements are germane to affective design, they will be included as additional design elements.



Captions from Left to Right:

Figure 52: Labyrinth of Hedges (Photo: Creative Commons)

Figure 53: Mandala Made of Tile (Photo: Federica Diliberto on Unsplash)

Figure 54: Biophilic Image of Forest (Photo: Creative Commons)

Topophilic design



Universal, sacred patterns



Beauty; Aesthetic appreciation



Captions from Left to Right:

Figure 55: Autumn Walk (Photo: Creative Commons)

Figure 56: Fractal Patterns (Photo: Vadim Gromov on Unsplash)

Figure 57: Sense of Touch (Photo: Nahuel Hawkes on Unsplash)

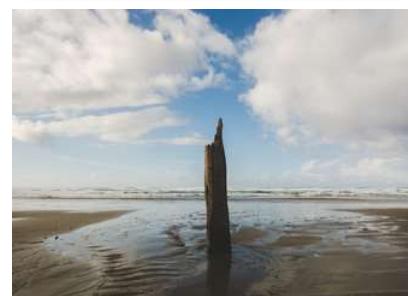
Symbolism



Metaphor



Archetypes



Captions from Left to Right:

Figure 58: Lotus, Rooted in Mud, but Blossoms Beautifully (Photo: Creative Commons)

Figure 59: 'Leaves are Like Emotions. Label the Emotion, then let it Drift.' (Photo: Robert Wnuk on Unsplash)

Figure 60: Post Archetype, Connecting Earth to the Heavens (Photo: Creative Commons)

Social Solutions in Mindfulness-Based Landscape Design

Research suggests that physicians, who talk with colleagues about work-related issues like frustrations, coping strategies, and resources needed to sustain practice, thrive in the profession (Grol et al., 1985). Along with Ulrich's Supportive Design Theory (Roger S Ulrich, 1999), the research presented in this thesis suggests the following: an opportunity for mindful communication, an open space for council circles, narrative, and storytelling, and an opportunity for mentoring, counseling, and sharing in an outdoor setting as outlined below:

- Sense of control and privacy
- Social support and opportunities for gathering and socialization
- Opportunity for physical exercise and movement
- Access to nature and positive distractions (wildlife, water, soothing sounds)
- Environmental comfort (Remove physical and ambient stressors)



Figure 61: Balint Group Meeting (Photo: Alexis Brown on Unsplash)



Figure 62: Secluded Bench Set in a Quiet Landscape (Photo: Creative Commons)

Burnout develops in a professional environment where relationships are not fostered, valued, or developed. Frail professional and social relationships facilitate burnout in employees. Design programs should provide opportunities for mindful social gathering, connection, and

sharing. Administrators and designers can remain cognizant of physicians' social needs during the conceptual and programmatic design phases by referring to *Table 3: Therapeutic Garden Solutions to Improve Physicians' Workplace Relationships*.

Table 3 outlines the design implications for therapeutic garden design that considers social solutions to improve workplace relationships. Two phases of design are considered: conceptual and programmatic. Conceptual and programmatic phases have specific considerations. Each design phase includes both active and passive engagement. The following list provides a set of mindful social accommodations:

Table 3: Therapeutic Garden Design Solutions to Improve Physicians' Workplace Relationships

THERAPEUTIC DESIGN	ACTIVE ENGAGEMENT	PASSIVE ENGAGEMENT
CONCEPTUAL	Access outdoor landscape	Social connection
	Group activity	Demonstrative value
	Social interaction	
Special Considerations	<i>Privacy; accessibility; security; comfort; safety</i>	
PROGRAMATIC	Balint group meetings	View out window
	Council circle/ gatherings	Communal elements
	Practice spiritual tradition	Real nature
	Social interaction/ communication	
	Access to food and water	
	Cultivating meaning	
	Narrative/ Storytelling	
Special Considerations	<i>Avoid: glare, excessive temperatures/humidity; loud/ unnecessary noises; excessive concrete/hardscape Include: natural ventilation; choice in both seating location and levels of sun exposure</i>	

The conceptual design phase should include the following considerations for active engagement: access to an outdoor landscape, provisions group activity, and opportunities for social interaction. Openings for passive engagement should encourage social connection and have elements that demonstrate value placed upon physicians' contributions in the workplace. Privacy, accessibility, security, comfort, and safety are special conceptual considerations.

Programmatic garden design should consider how physicians can engage in the following social activities: Balint group meetings; gathering; participating in spiritual traditions; engaging in social activities; interacting/ communicating; sharing of food and water; cultivating meaning; and opportunities for imparting narrative/stories. Additionally, physicians need passive engagement opportunities that can be gained by looking out a window at scenes of real nature that includes communal elements. Special considerations in the programmatic phase of design include avoiding glare; excessive temperatures/humidity; loud/ unnecessary noises; and excessive concrete/hardscape. It is important to include natural ventilation and opportunities for physicians to choose both seating location and levels of sun exposure.

In addition to the theories presented in this thesis, an additional layer of interpretation that relates specifically to physicians in medical settings. The suggestions provide preventative measures and therapeutic design solutions to treat emotional exhaustion due to burnout. The suggestions will add value to therapeutic garden design theory and help form conceptual and programmatic design principles.

Balint Groups.

- Opportunity for mindful communication
- Open space for council circles (Balint group meetings), narrative, and storytelling
- Opportunity to mentor, console, and share

Environmental Solutions in Mindfulness-Based Landscape Design

It remains unclear just what mechanisms underlie the beneficial aspect of nature. Whether due to a biological, sensory, biophilic, or topophilic reaction, the fact remains that humans are

deeply affected and effected by nature experiences. Administrators and designers can remain cognizant of physicians' environmental needs during the conceptual and programmatic design phases by referring to *Table 4: Therapeutic Garden Design Solutions to Improve Physicians' Situational Well-being*.

Table 4 outlines the design implications for therapeutic garden design that includes design solutions which can be developed outdoors. Two phases of design are considered: conceptual and programmatic. Conceptual and programmatic phases have specific considerations. Each design phase includes both active and passive engagement. The following list provides a set of mindful environmental accommodations:

Table 4: Therapeutic Garden Design Solutions to Improve Physicians' Situational Well-being

THERAPEUTIC DESIGN	ACTIVE ENGAGEMENT	PASSIVE ENGAGEMENT
CONCEPTUAL	Access outdoor landscape	Nature experience
	Contemplative practices	Biophilia
		Topophilia
Special Considerations	<i>Privacy; accessibility; security; comfort; safety</i>	
PROGRAMATIC	Gardening	View out window
	Exercise	Real nature
	Access to food and water	Symbolic elements
	Controlled movement	Active natural habitats
	Meditation	Sensory stimulation
	Cultivating meaning	Aesthetic appreciation
Special Considerations	<i>Avoid: glare, excessive temperatures/humidity; loud/ unnecessary noises; excessive concrete/hardscape Include: natural ventilation; choice in both seating location and levels of sun exposure</i>	

The conceptual design phase should include the following considerations for active engagement: access to an outdoor landscape and provisions for contemplative practices. Opportunities for passive engagement should encourage nature experiences, development of

design based upon topophilic and biophilic expression. Privacy, accessibility, security, comfort, and safety are special conceptual considerations.

Programmatic garden design should consider how physicians can engage in the following outdoor activities: gardening; exercise, harvesting food and drawing water; space for controlled movement and meditation; and opportunities to extract meaning. Additionally, physicians need passive engagement opportunities such as a window view toward real nature; watching active natural environments; sensory stimulation; symbolic elements; and an opportunity for aesthetic appreciation. Special considerations in the programmatic phase of design include avoiding glare; excessive temperatures/humidity; loud/ unnecessary noises; and excessive concrete/hardscape. It is important to include natural ventilation and opportunities for physicians to choose both seating location and levels of sun exposure.

Befitting typologies.

Clare Cooper-Marcus lists a variety of landscape typologies used in medical settings (Marcus & Barnes, 1999, p. 115). Not all types, such as “Landscaped Grounds”, “Entry Garden,” “Front Porch”, seem suitable for a private bunker garden. The paradise/ monastic garden precedent closely resembles a private space most conceptually similar to a bunker garden. The following list selects the typologies most befitting for the practice of Mindfulness-Based Stress

Reduction in a therapeutic garden for physicians in a medical setting:

Courtyard



Roof Garden



Roof Terrace (balcony)



Captions from Left to Right:

Figure 63: Courtyard Garden (Photo: Creative Commons)

Figure 64: Rooftop Garden with Movable Chairs (Photo: Creative Commons)

Figure 65: Landscaped Balcony Terraces (Photo: Chris Barbalis on Unsplash)

Meditation Garden



A Tucked-away Garden



Healing Garden



Captions from Left to Right:

Figure 66: Garden for a Discovery Meditation (Photo: Paul Rysz on Unsplash)

Figure 67: A Tucked-Away Garden for “Private Use Only” (Photo: Creative Commons)

Figure 68: Healing Garden using Gardening as Therapy (Photo: Creative Commons)

These selected typologies are included in this discussion because they have the most potential for privacy. The courtyard, roof garden, roof terrace, meditation garden, and tucked-away garden allow for easy access. Entry may be secured using an identification card or access code. Windows, on-looking the space from inside the building, become a drawback to the courtyard, meditation, and tucked-away spaces. This situation may cause a “fishbowl” effect, creating a feeling that physicians practicing MBSR are observed or scrutinized. The roof garden and roof terrace could offer expansive views allowing physicians to feel a sense of awe or perspective. Excessive temperatures, wind, and noise may become potential drawbacks for roof or terrace gardens. Additionally, lack of water, sunlight, or real nature may not provide characteristics elemental to a restorative experience. Healing and meditation gardens could provide an ideal small, quiet, enclosed space for physicians. The tucked-away garden, similar to a meditation garden, may exist adjacent to a hospital or between medical buildings. Since it is away from the medical facility, it would have to be secured for physicians only. Additionally, a short walk to a therapeutic garden may discourage physicians from visiting, creating a drawback for this typology. Both viewing garden and borrowed landscape have potential as meditative spaces; however they do not satisfy the requirements for social support in real nature.

Medical facilities do not provide physicians with a private, healing space within or outside the workplace. A majority of physicians suffer greatly from the events, pressures, and the burdens

Nature Trails and Nature Preserves



Figure 69: Nature Preserves for Forest Bathing (Photo: Creative Commons)

of responsibility, which correspond with their profession. This research focuses on “burnout” as a particular factor in therapeutic garden design. It identifies how therapeutic, garden design theory for healthcare facilities may benefit from greenspace design based upon the Mindfulness-Based practices. The resulting, design principles supplement existing design theory by conceptualizing a restorative garden for physicians circumventing and/or coping with burnout.

CONCLUSION

“The dogmas of the quiet past, are inadequate to the stormy present. The occasion is piled high with difficulty, and we must rise -- with the occasion. As our case is new, so we must think anew, and act anew. We must disenthral ourselves, and then we shall save our country.” (Lincoln, 1862)

Our nation is currently in the midst of many crises. Climate, education, and healthcare are in need of new approaches to solve the complex problems facing our society. “Healthcare reform”, as a topic of discussion, has taken over the soundwaves. Fundamentally, the population of the United States desires and seeks access to world-class physicians. Patients place faith in the precise training and educated skills of society’s healers. Our physicians, however, feel overwhelmed and unsupported. Their profession could be the litmus test for how dysfunctional the current model of healthcare operates.

Physician burnout emerges as the product of a medical community in crisis. Burnout creates many issues in society. For the service provider, physician burnout creates significant losses such as absenteeism; drop-out; seeking and recruiting qualified replacements; and re-training a productive staff. For patients in the care of a physician struggling with burnout; they arrive seeking a healing, humanizing, and compassionate experience. Unfortunately, they are left feeling worse by the dehumanizing and unfeeling care experienced. For physicians personally, after many years of education and training, they either choose to leave the profession, abuse drugs and alcohol, or, in the worst-case scenario, die by suicide.

No one wants to imagine that their physicians are suffering. Yet, the majority of them are suffering burnout in silent isolation. The medical profession has recognized this issue and

implemented various in-house programs to support physician wellness. Programs based upon contemplative arts have been implemented. Balint groups have been formed. Retreats, newsletters, and training programs have been organized. Of these programs, Mindfulness-Based Stress Reduction (MBSR) has proven effective. Where do healing gardens fit this framework?

Healing gardens have proven successful as therapeutic approaches to stress. This thesis argues that the healing gardens located in medical facilities are not helpful to our struggling physicians. Landscape architects are called upon to create therapeutic landscapes, or healing gardens, as part of the healthcare experience. Granted, staff do visit these healing gardens for restorative experiences. However, in a culture where the white coat epitomizes a distinguished professional manner, the matching conduct must be in step. Conventional healing gardens currently do not offer distressed physicians the proper conditions for a therapeutic experience.



Figure 70: Distressed Physician in a Healing Garden with Public Access (Photo: Melissa N. Philen)

Landscape architects must reevaluate the timing of their contributions to therapeutic design. Far too late in the design process do clients consider including outdoor nature experiences or psychologically relieving environments. Building administrators either request their services at the end of a design process or as an afterthought to the building's construction. This timing is poor considering the value landscape architect can bring to the design table. Early in the design process landscape architects can suggest design solutions based upon the benefits and well-documented value that nature has upon wellness. Designers possess a toolbox containing theoretical education; scientific knowledge; building proficiency; public facilitation skills; design creativity; and a burgeoning list of evidence-based design examples. Their broad knowledge-base must be present in the design process from the outset. Beyond this broad knowledge, this thesis presents a method to design with compassion. Mindfulness-Based Landscape Design offers a method to provide compassion to distressed physicians. It offers a method to evaluate current healthcare structures and wellness programs in the healthcare setting. It offers guiding principles for physicians' mental, social, and environmental well-being.

This research also argued that because current healing garden design theory does not include considerations for physicians specifically, then, designers must seek a method proven to help build resilience in physicians. The Mindfulness-Based Stress Reduction program, again, emerges as that successful program. This thesis adopted the challenge of merging the MBSR program with the designed medical environment. Given an imperfect medical structure, the following writing by Senauke warns about mindful practice becoming a self-help technique if the institution does not take seriously a mindful-healthcare-model.

“Even for those who are working in education and healthcare – fields required for harmonious society – is mindfulness taught in a way that reflects on dysfunctional organizational structures within which well-meaning employees are work down to cynicism and powerlessness over the course of a career? In a world where “efficiency” rules, is mindfulness taught in a way that helps teachers and providers guard against tendencies to treat students and patients without sufficient regard for their true and human needs? If such matters are not surfaced, then “right” mindfulness is not being taught.” (Rosenbaum & Magid, 2016, p. 76)

The mindful-medical practitioner is not alone in the solution. This “critical” assessment illuminates the dark side of mindfulness and suggests that the 2-tiered solution to physician burnout *must* occur in harmony. Changes from individual reflection and the organization obligations in which they practice could begin with the facility’s initial planning process.

Burnout is a 2-tier process between physicians and the provider. First, and where landscape architects have a stake, is to mitigate structural and functional devices of burnout. Second, is to bolster individual resiliency. Both, top-down and bottom-up approaches become necessary. Medical education must begin to include three components of outreach: open dialogue about depression and suicide; encourage help-seeking behaviors to reduce stigma; touting benefits of encouraging, caring, vigilance among colleagues for help-seeking behaviors. (Nagy et al., 2016) Additionally, supportive, restorative, therapeutic healing gardens in the medicine’s educational environment must provide the environment where these dialogues, relationships, and practices can commence. Mindfulness practice in an outdoor environment must begin in parallel with the education of a physician.

Two additional problems face the implementation and successful use of bunker gardens for physicians specifically. First, medical space costs a premium. Healthcare systems value architectural decisions emphasizing efficient function and form. “‘Landscaping’ is often seen as a cosmetic extra — important to set the right image at the hospital entrance or in setback from adjacent streets, but rarely viewed as a significant adjunct to patient healing or as a setting for stress reduction for staff and visitors.” (Marcus & Barnes, 1995, p. 9)

Through an in-depth examination of the Mindfulness-Based Stress Reduction program, this research identified theories, methods, and practices necessary for a stress-reducing state. Additionally, environmental theory, design precedents, and typologies were identified. Finally, design guidelines sifted out the elements necessary for physicians’ therapeutic experience in the workplace.

To help improve the lived experience of physicians within the workplace, first, physicians need a bunker. Physicians need a more private environment to have a therapeutic experience. Second, the environment must consider clinical, social, and environmental considerations related to burnout. The design guidelines listed in the discussion provide an excellent starting point for design.

Additionally, schematic design should include a thorough investigation of physician preferences. Designers, administration, and hospital planners must make design decisions based upon understand cognition, perception, and emotional effects of the workplace environment on physicians’ perceived wellness. A healthy design is one that branches from an engaged dialogue. Early in the design process, decisions relating to the health and well-being of physicians and staff must be discussed among designers, physicians, staff, Board of Directors, committees, councils, officers, planners, and funding agents. Conceptual building design, including space dedicated to

private outdoor space, for physicians only, would benefit the medical establishment. Decisions made regarding design could help facilitate mindfulness-based practices.

At the organizational level, designers must work with medical institutions from the outset. In the words of artist, writer, and teacher, Suzi Gablik, “Community is the starting point for new modes of relatedness, in which the paradigm of social conscience replaces that of the individual genius... There is another kind of art, which speaks to the power of connectedness and established bonds, art that calls us into relationship. “ (1991, p. 114) Landscape architecture is the art, which could meld mindfulness, nature, and the built environment for compassionate, therapeutic, stress-reducing experiences.

The mindfulness-based landscape design principles, described in this document, would benefit physicians who work in a variety of facilities in the healthcare delivery system including the following: individual clinics, independent practices, clinical practice groups, government entities, such as Veterans Administration (VA) hospitals; hospital clinics; hospital organizations; and private sector facilities, such as adult assisted living; extended care facilities, adult assisted living, adult foster care, and hospice (Westphal, 2003). The landscape architect’s work remains in a dynamic, active, and participatory design process. Only then will a bunker garden endure as useful, working space for physicians. Ultimately, culture attaches a premium upon physicians as highly regarded, educated, trained, caretakers, with honed, professional aptitudes. This research aims to conceptualize an outdoor, private, restorative, therapeutic environment that reflects that premium.

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