HEALING WITH NATURE:
AN APPLICATION OF
TRADITIONAL CHINESE HEALTH-PRESERVING THEORIES
AND CHINESE CULTURE
IN THERAPEUTIC GARDEN DESIGN
A CREATIVE PROJECT
SUBMITTED TO THE GRADUATE SCHOOL
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Abstract

The importance of the natural environment and its relationship to health and physical and psychological well-being was once recognized and deeply rooted in Chinese traditional health-preserving philosophy. However, ancient awareness of restorative benefits of the natural environment is now ignored in China. In Chinese hospitals, there are increasing areas of buildings and parking lots, resulting in the loss of court yards and open space.

In some parts of China there is a trend of renewed interest in the role of designed natural environments, though little has been done to advance the idea of therapeutic gardens using ancient Eastern philosophies and approaches. In Western countries, however, the connection between therapeutic gardens and health care facilities has been underway for a longer period of time. This presents an opportunity to explore and study both approaches, combining the two to advance therapeutic garden methods and practice.

This creative project centers on incorporating traditional Chinese health-preserving theories along with Western approaches in hospital landscapes. General principles and guidelines are proposed and applied to the landscape design of a Chinese hospital (Wuhan Iron & Steel Hospital). It is hoped that these findings contribute to the formulation of a model for the design of therapeutic gardens in Chinese hospitals.
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CHAPTER 1 INTRODUCTION

With the development of society, there has been great improvement in healthcare institutions. Concepts embodied with phrases like *quality of life* and *well-being* are recognized with increasing importance in the 21st-century, which has led to an interest in the role of designed outdoor environments in healthcare settings (Jean, 1). Landscapes in hospitals are considered not only as decorative, but rather an important complement to treatment during healing process (Shu, 1).

In recent years, in both Europe and the United States, interest in therapeutic gardens has increased within the field of landscape architecture. In 1999, the Joint commission for the Accreditation of Hospitals Organization (JCAHO) stated “Patients and visitors should have opportunities to connect with nature through outside spaces, plants, indoor atriums, and views from windows” (Jean, 2).

However, in China the idea of therapeutic gardens is still new in healthcare design. And in most parts of China, landscapes in healthcare facilities are treated as dispensable decoration within massive building complexes (Shu, 1).

Actually, the recognition of the importance of natural environment and its relationship to human health, both physically and mentally, was once deeply rooted
in Chinese traditional medicinal philosophy (Yi, 11). Chinese traditional methods are holistic, based on the idea of a harmonious relationship between nature and human beings. These methods center on the belief that the “well-being of an individual is an integrated organism within the context of his cosmological, natural and social environment” (Arthur, 95).

However, today this long-standing, ancient, awareness of the restorative benefits of outdoor environments and elements is neglected in China. In the West, the pattern of neglecting the benefits of the natural environment is well-known and attributed to the advancement of “high-tech machines, high-cost drugs, and increased medical specialization” (Cooper-Marcus, Gardens in Healthcare Facilities 9).

In China, the same trends are contributing to this disconnect between health and the outdoor environment. Additionally, Chinese hospitals have experienced substantial increased construction, and the new buildings and parking lots contribute to the shrinkage of court yards and open space (Patrick, 25). Consequently, patients have little chance to be exposed to an outdoor healing environment while receiving treatment.

In some parts of China there is renewed interest in the role of designing natural environments for hospitals, but due to the lack of related research successful cases can rarely be found. This situation calls for a research on how to approach the design of gardens at health care facilities in China, and is a prime opportunity to investigate how to apply Chinese health preserving theories in this process.

Due to social pressure, the fast pace of today’s lifestyles and polluted
environments, an increased number of people are in a state of sub-health. Research findings indicate that today only 15% people are healthy, 15% people have a diagnosis of disease, and, the vast majority, 70%, are in the state of sub-health (a grey area between healthy condition and disease) (Shu, 1).

In an effort to improve the difficult situation of recent global economic recession along with the rising cost of public healthcare, the Chinese government has made an effort to educate people about Traditional Chinese Medicine (TCM). It is hoped that this will both improve public health and positively impact the economic situation; TCM is an important component of traditional Chinese health-preserving philosophy. Its central idea is to enhance the self-healing power of human beings for curing disease and keeping fit. TCM says that “everyone has his own potentialities for living a good life, and “health for one” is possible if everyone could be taught the knowledge about the self-healing power” (Yi, 5). TCM therapies include massage, acupuncture, meditation, Taichi, diet recommendations, and herbal medicine (Allen, 2010). Because most of these therapies are closely related to the daily lifestyles of individuals, they are affordable and easy to implement. Also, herbal medicine is less expensive and more natural compared to Western medicine. For these reasons, it is beneficial to look into how to incorporate the TCM into the design for healing landscape in hospital settings.

Problem Statement

This creative project centers on the incorporation of healing gardens at Wuhan Iron & Steel Hospital in Wuhan City. Specifically, it explores Western healthcare
gardens, Traditional Chinese Medicine, and Chinese landscape design to develop guidelines for the design of gardens at the hospital.

The questions asked in this creative project include the following:

What characteristics of Western healthcare gardens are applicable to the design of Wuhan Iron & Steel Hospital gardens? What is in the history of Chinese landscape culture and medical development, and how can these findings be applied in the design of gardens at healthcare facilities?

**Delimitations**

Due to the time limitations, creation of construction documents and detailed planting plans, identifying funding for the project and post occupation evaluations will not be completed as part of this creative project.

**Assumptions**

It was assumed that Wuhan Iron & Steel Hospital is interested in and supportive of the design and implementation of healing gardens on their grounds. It was also assumed that the proposed plans will meet hospital and city’s planning and architectural codes.

**Methodology**

In this creative project four methods were applied: qualitative methods, quantitative methods, visual assessment and content analysis.

Quantitative data are necessary to understand how people and communities experience and act on sites, and can offer a partial picture of health effects and their causes. (Brown, 1789) In terms of quantitative methods, I calculated how many
people, including visitors, patients and workers were using the outdoor space at the hospital during different time periods. These calculations were then categorized by activity types. This data helped me to evaluate problems of the site, and provided indications about the potential value of different spaces.

“Qualitative methods are especially important to community environmental health research, as they give voice to individual and community – based organizations and characterize the community in a full and complex fashion” (Brown, 1789). Four phases comprised the implement of the qualitative methods in this project.

First, a literature review of Chinese health-preserving philosophy and Chinese culture was completed. This included traditional Chinese medicine, Chinese geomancy, Daoism theory, and Chinese classical garden design.

Second, on-site case studies of hospitals from Western and Eastern countries were completed. Garden and green space characteristics were noted and how people used the spaces was observed. The aim was to expand the understanding of hospital landscapes both in Western and Eastern countries to gather applicable ideas for this project.

Due to the limitation of time and money, the hospitals observed were limited to key ones in USA and China. In terms of Chinese hospitals, some were located in Wuhan City; this helped me better understand the context and regional culture of my creative project site. Other hospitals were located in southern part of China (Shanghai city and Hangzhou city), where the most well-known Chinese private
gardens are situated. In these cases, because the cities are rich in traditional landscape culture, I was able to observe how tradition may be integrated into hospital landscape design. Since precedents of designed landscapes in Chinese hospital settings are rarely found, the main purpose of these case studies was to better understand how space was being used and how cultural elements are integrated into the design of healing landscapes.

In the United States, I visited eight healthcare landscapes. A range of site types were chosen -- some were large, some were small, and a few were roof gardens. Locations included Boston, New York, San Diego and Glendale, California.

Third, because exercise is a key component of TCM, I gathered related information through direct observation in Wuhan City’s district park. I completed my morning observations from 6:00 – 9:00 a.m. (the most comfortable time during August), aiming to better understand how local people exercise and utilize park spaces.

Fourth, I interviewed visitors, patients and workers in Wugang Iron & Steel Hospital, to explore how they felt about the space in the hospital, what their landscape expectations were, and how they might react to various kinds of landscapes. The results of these interviews were part of the evaluation process to explore the problems and opportunities of the site, and directly guided my design work.

In terms of visual assessment, I evaluated the surrounding landscape of Wugang Iron & Steel Hospital. This was completed according to my understanding
and aesthetic taste as a student of Chinese landscape architecture supplemented by a Western landscape architecture education. To accomplish this, I took pictures and evaluated the visual characteristics of the site. Additionally, I developed an evaluation chart to tally the instances where Cooper Marcus’ typology of space characteristics were present (Cooper-Marcus, *Gardens in Healthcare Facilities* 11-23).

**Outcomes**

This creative project resulted in general principles and guidelines for a therapeutic garden for application in an urban environment, particularly in China. Further, these guidelines were applied to the landscape design of an urban Chinese hospital (Wuhan Iron & Steel Hospital). It is hoped that these findings contribute to the development of a model useful in the landscape design for hospitals in China.

**Key definitions**

**Gardens**

In the realm of landscape design in healthcare settings, there are various garden types with distinct definitions. Because of the sensitivities of the settings, it is important to differentiate the characteristics of these gardens. The following garden type definitions utilized in this study were taken directly from Nancy Gerlach-Spriggs’ writing about therapeutic gardens in an American Society of Landscape Architect’s (ASLA) newsletter (Gerlach-Spriggs, 1).

**Healing garden**

A healing garden is somewhat vague term lacking precise design
implications, but its purpose is to support generalized healing by helping patients become healthful, well and whole.

Meditation garden

A meditation garden is likely to encourage inwardly focused attention for the purpose of deepening personal knowledge and attaining peace with oneself.

Contemplation garden

A contemplation garden provides an ambience conducive to examining issues beyond and/or larger than oneself in a thoughtful, deliberate, perhaps religious or mystical way.

Restorative garden

Help patients return to an ideal or normal state from a stressed or agitated one, or from boredom and/or an inability to focus. It includes four essential components:

- Being away (i.e., physical or psychological escape)
- Extent (i.e., connectedness and scope, sense of a whole other world)
- Fascination (i.e., involvement)
- Compatibility (i.e., environmental support of intended activities)

In a designer’s vocabulary, a restorative space may best be described as a coherent design in a place away, with gentle, undemanding stimuli where an individual can do what he/she needs in order to recover.
Therapeutic garden

The therapeutic garden may, and most likely should, include aspects that promote restoration and more than any of the other garden types. The purpose of a therapeutic garden is the intent to support the patient’s cure and recovery in the medical environment. It can imply treatment or a remedy with the expectation of a positive measureable outcome.

Stress

Stress is an essentially important concept to interpret the relationship between people’s physical well-being and their surrounding environment, and, more specifically, to explain why gardens in healthcare settings should affect medical outcomes (in Cooper-Marcus, Healing Gardens 31).

“In a broad sense, the term ‘stress’ is used here to indicate a process of responding to events and environmental features that are challenging, demanding, or threatening to well-being” (Cooper-Marcus, Healing Gardens 32). Stressful aspects in hospital settings include a multitude of happenings and/or conditions. A patient may be afraid of an upcoming surgery, or may be in pain, or feeling anxious about unknown diagnostic procedures. They may experience a loss of control, including their loss of privacy. Or, they may feel depersonalized due to the hospital’s health care procedures, the uniform structure of activities, what they must wear, or strict visiting hours (in Cooper-Marcus, 32).

Another major stress can result from poorly designed healthcare environments: ones that are characterized by noise, confusing way-finding, lack of privacy, denied
personal control over television, being forced to stare directly at glaring ceiling lights when bedridden, and being in rooms arranged without access to windows. Moreover, stress not only affects patients, but is also a problem for families of patients and visitors, and it is found widespread among healthcare staff (in Cooper-Marcus, *Healing Gardens* 32).

**Conclusion:**

The development of Chinese society and the increasing self-awareness of individual well-being led me to be concerned about the designed environment in healthcare settings. As well, Chinese health preserving culture is an important component of medical treatment, and educating citizens about it is considered an economic strategy for China. These factors underscore the importance of determining how to integrate of Chinese health preserving theories and cultural beliefs into the design for healthcare environment. In the following chapters, I elaborate on the main theories of Chinese health preserving culture and key elements and techniques of Chinese classical garden design. I also review healthcare garden examples found in the Western and Eastern healthcare settings, and I establish general guidelines typical for the landscape design in urban Chinese hospitals. Finally, I apply these guidelines to the landscape design for Wuhan Iron & Steel hospital, and provide protocols for the evaluation of the garden designs.
CHAPTER 2 BACKGROUND INVESTIGATION

This chapter presents background information for this creative project. First a review of general health/medical developments and their connection to nature and outdoor healing environments is presented. Then, a detailed look at Chinese health-preserving philosophies and Chinese culture related to landscape design is offered.

The Development of Healing Environments in China

In ancient times, the practice of traditional Chinese medicine emphasized the surrounding outdoor environment. As early as the Three Kingdoms Period, a practitioner named Dong Feng did not ask for financial reward when he treated patients. Instead, he asked his patient to plant apricot trees around his clinic as a form of remuneration: the people with minor illnesses were asked to plant one apricot tree and the people suffering from serious afflictions were asked to plant five. As time passed by, his clinic was surrounded by hundreds of thousands of apricot trees. From then on, hospitals in China have also been called Apricot Woods. This is the earliest example of a sustainable hospital in China: the act of planting was a healing exercise, a large scale planting brought about a healthier
environment, and it was possible to harvest herbal medicine from this place. This approach achieved low cost, low financial investment and low operational organization (Yunluo, 51).

Another type of healing garden in ancient times was usually associated with temples, where people engaged in religious or spiritual activities in order to relieve their pain in spirit. Also, most private Chinese gardens in olden times were used as restorative spaces; they were restful places for scholars, poets or former government officials, who had lost their faith in the leaders of their times. However, in the twentieth century, with the advancement of medical technology, the healing function of gardens was gradually forgotten (Haibo, 43).

The development of outdoor healing environments has been intertwined with the development of hospitals in China. Different eras are marked with particular developmental characteristics. Since the beginning of the twentieth century, Chinese hospital development has experienced four distinct periods that had significant influence: the Transplanting Period (early 1900s through the 1940s), the Prevalence and Stagnancy Period (around the 1950s), the Development Period (1980s), and the Marketing Period (1990s) (Ying, 85). The following descriptions elaborate on each time period:

**Transplanting Period (early 1900s – 1940s)**

At the beginning of hospital construction, China directly copied the experience of the Western world. Hospitals were constructed together with churches, where missionaries also acted as doctors, thus propagandizing religious beliefs while
treating patients. Some other types of hospitals at that time were reconstructed from residences, thus the traditional courtyard-style layout of the residence was kept as part of the hospital. Later on, another type of hospital combined Chinese and Western elements together, as seen in the Western style corridors integrated with Peking courtyard. Typical representatives of this style are Beijing Xiehe Hospital, Shanghai Zhongshan Hospital, Nanjing Hongqiao Hospital and Shanghai Women & Children Hospital. These hospitals are in the layout of the shape of a Chinese character 井 or 工, which evolved from the layout of Peking courtyard, using corridors to connect buildings, leaving the rest of enclosed area as green space. However, during this time frame, the function of green space was limited to screening off noise and dust from the streets, and the restorative nature of outdoor space was not considered (Ying, 85).

Prevalence and Stagnancy Period (~1950s)

Upon the establishment of People’s Republic of China in 1949, the Chinese socialist party and the international political situation at that time heavily influenced the decision to turn to the Soviet Union (also a socialist country) for inspiration in the design and construction of hospitals. This resulted in using master plans from the Soviet Union for constructing most hospitals during this time period. Therefore, the design styles of both the architecture and the landscape were very similar across China (Ying, 86).

Development Period (1980s)

In the 1980s, with the initiation of reforms and open policy in China, there was
great improvement in medical and health institutions, especially in the expansion of
their scale. For example, city hospitals were expanded from 300-400 beds to
500-600 beds, and some large hospitals even expanded to 1000 beds. Multi-story
buildings began to be constructed, especially by large hospitals located in city
downtowns where land was limited and expensive. Not surprisingly, the expansion
contributed to an increased demand for land. When the preserved land was used
up, green space gave way to buildings, which resulted in the shrinkage of green
space at most of hospitals. By the end of this decade, in some hospitals, other than
a six foot planted border between hospital buildings and the streets, there was little
green space left: the original garden and green space was replaced by buildings. At
other hospitals the green space was replaced by parking lots to accommodate
higher patient numbers and the increased popularity of driving (Ying, 86).

Marketing Period (1990s)

In the 1990s, there was a push in large city hospitals to expand the volume of
business and resulting profit. With this, the focus of hospitals (that could get
financial support from banks or the government) shifted from disease prevention
and life support to service and benefit return (Ying, 87).

Some large hospitals tried to catch up with developed countries in terms of
medical environments, treatment levels and profit, which led to a renewed interest
in healing environments. The enhancement of living standards also helped to bring
attention back to the environment. However, even though landscape was brought
back into the design during reconstruction, it was still viewed as a decoration to the
hospital. The total green space was not large in scale and there was little consideration for the needs of patients in this regard. Also, because of the overwhelming drive to bring in elements of Western medicine, the design for hospital landscapes rarely incorporated Chinese elements, let alone the philosophy of Chinese traditional medicine.

Until recently, though there were already some pieces of research related to healing landscape design at hospitals, few designers have explored how to incorporate traditional Chinese culture and Chinese health preserving philosophy into hospital landscape design. A few hospitals exemplify the effort to integrate theories of traditional Chinese medicine, like the theories of Five Phases and of Yin and Yang. Unfortunately, the results were very superficial, such as adding a Taiji Bagua diagram, or a walking platform composed of five earth colors. The garden designs lacked opportunities to help patients, staff and other visitors, and a thoughtful integration of traditional Chinese medicine philosophies, theories, and practice.

*The Development of Healthcare Environments in Western Countries*

Healing gardens first appeared in hospitals and monasteries in Europe around the Middle Ages, which included courtyards to serve the sick and insane for reflection. Spaces for growing food, growing herbs for medicinal use and flowers for ceremonies were also incorporated (Tyson, 3). The layout of these areas was often symmetrical, traditionally divided into quadrants with a well or fountain at the center. During the fourteenth and fifteenth centuries, with the decline of the
monasteries, the incorporation of gardens declined. By the seventeenth and eighteenth centuries, the rise of scientific medicine contributed to a renewal of the interest in the available spaces surrounding a hospital (Gerlach-Spriggs, 16).


The Healing Landscape, the renewal of the interest in outdoor spaces came from the new theories about spreading of infection by “noxious vapors.” The passage of infections by germs was beginning to be understood, and it was believed that the lack of fresh air would bring about illness. Influenced by this theory, more outdoor spaces were incorporated in between wards. It was not until the late eighteenth century that gardens were widely used for therapeutic purposes (21).

During the same time frame mental hospitals began utilizing gardens for horticultural therapy. Psychiatric institutions used planted outdoor spaces to provide screening from outsiders, so patients could have comforting experiences in landscaped areas. Patients were active participants on the grounds: they helped with maintenance, gardening and farming as part of their therapy (Epstein, 1998). In order to help improve the mental status of the patients, hospitals were designed as a home-like and restful environment, and some of the area was used for horticultural therapy (Ken, 2000). Because of the success of this treatment modality, the institutions were soon overwhelmed and became state-run asylums (Gerlach–Spriggs, 21).

After World War II, Western hospitals were generally constructed into
multi-story buildings instead of the traditional pavilion style buildings. The change was for the convenience of hospital staff rather than the comfort of the patients. Through the shrinkage of the outdoor space, more occupational therapists applied garden therapy to channel the wounded soldiers’ thoughts from those of destruction to those of creation (Gerlach–Spriggs, 29). This marked the rise of modern horticultural therapy.

Today, gardens in hospital facilities have again given way to technology, drugs, and medical specialization, and “the special emotional needs of patients, families and staff, as well as the restorative nature of outdoor spaces” have been ignored (Cooper-Marcus, 15, Healing Gardens). Gardens in some other facilities, however, have been utilized for horticultural therapy for the elderly, veterans, and people with various types of dementia. In hospices, gardens are often used for their restorative and therapeutic effects (Ken, 3).

*The traditional Chinese Concept of Health Preservation*

Ancient Chinese civilization accumulated a wealth of experience in health preservation, with multiple aims: enhance physical fitness, prevent disease, postpone aging and prolong the life. In order to achieve health preservation, the Chinese developed a series of health-preserving philosophies for every aspect of life, such as Chinese geomancy, Taoism theory, and traditional Chinese medicine. From these we can draw valuable experience and inspiration for the design of therapeutic gardens and healing landscapes.
Chinese Geomancy Theory

According to Geomancy Theory (first published by Yi in c. 1750), when selecting a place to live, one should first consider the geomantic condition of the place (in Teather, 1).

Freedman’s (1979) writings elaborate on this, “Men [sic] belong as of right in the universe. Heaven, Earth and Man form a natural triad. But what men construct is an intrusion, and geomancy is preoccupied with the problem of allowing men to build what they need and want without destroying their natural relationship with the cosmos. (331)”

Needham (1954) also indicates this connection: “Purely superstitious though in many respects [feng shui] sometimes became the system of ideas as a whole undoubtedly contributed to the exceptional beauty of positioning of farmhouses, manors, villages and cities throughout the realm of Chinese culture” (240).

Chinese Geomancy theory (Feng Shui) is a natural science involving the knowledge of geography, meteorology, landscape architecture, ecology and urban architecture. The aim of Feng Shui practice is to attain an environmental harmony with its integrated traditional cosmos of heaven, earth and humans -- or, in modern terms, an integration of space, time and energy (Teather, 323). As one of the oldest traditions in China, for at least 4000 years Feng Shui has had a significant influence on the shaping of human environments in the Chinese cultural sphere. Ancient people used Feng Shui as a surviving craft of environmental management, which could account for the traditional rural landscape in large parts of China, including
the location of villages and their detailed layouts; the sitting and aspects of
individual houses, temples, earth-god shrines, ponds and watercourses; the
location and survival of woodland; the routes of pathways; the sitting of graves; and
the nature of boundaries” (in Teather, 313). Thus, Feng Shui deserves to be
systematically and seriously studied, to better understand its concepts and
principles, and to integrate them into the design of healing environments.

Feng Shui stresses the harmonious and balanced relationship among people
and between humans and natural surroundings. There is only one strategy that can
achieve and maintain the ideal situation: acquiring and keeping in balance of
sufficient Chi. “Chi is a unique Chinese concept, which can be explained as an
energy that cannot be seen, touched, tasted, or smelled. Ancient Chinese believed
that Chi pervades every element in the cosmos and is the beginning of all life.
Therefore, human beings, animals, plants, and nature are all equal and should
coexist together in harmony as oneness” (in Ke, 78). Chi could be blown away by
wind and is accumulated by water. This is, in fact, is where Feng Shui’s name came
from -- it literally means wind and water. Since Chi is invisible, using wind and water
to locate Chi is important (Ke, 77).

Yin and Yang are two kinds of Chi with opposite characteristics. Yin, defined as
female, is dark, void, or negative energy, and is passive, usually concerned with
receiving. Yang, defined as male, is light, solid, or positive energy, and is active,
concerned with moving forward. Thus, when Yin and Yang meet and stay in balance
life can begin. Their continually complementary interaction creates an ideally
harmonious location (in Ke, 78).

When geomancers look for the best location, they need to distinguish the “dragon vein,” a linear configuration of higher ground along with Chi, to figure out which flows of Chi are beneficial and which are dangerous. According to Feng Shui theory, a desirable Chi means a location found behind Yin and in front of Yang. In terms of environmental features, stable mountains are Yang and flowing water is Yin. Together, they form a closed, united space. The interrelated landscape features of topography and hydrology indicate the desirability of a site for human habitation based on the stability and harmony of Chi. The best site is enclosed by many mountains and rivers, where Chi cannot been blown away, but is concentrated and provides balance between Yin and Yang (Teather, 313).

According to Ke (2001), an ideal Feng Shui site has the following features (see fig. 1):

- A high mountain forming a backdrop site called Hsuan Wu (Black turtle). A lower mountain to the right called Pai Hu (White tiger), and one to the left named Ching Lung (Blue dragon).

- A relatively flat area of grassland just in front of Hsuan Wu called Ming Tang. Its center, Hsueh, is the specific spot accumulating the most Chi on the site.

- A winding inward river that flows in front of Ming Tang and separates it from the front hills of An Shan and Chao Shan.
Shan refers to the near front hill because it lies near the river and Ming Tang, while Chao Shan refers to the far front hill.


The following provides a summary of the principles behind Feng Shui for an ideal location, including spatial configurations, focal points, ground textures, and water and vegetative elements.

**Spatial configurations and depth cues**

An ideal Feng Shui location is characterized by a special configuration, which is
an enclosed space surrounded by mountains. Lower hills are at the front and higher mountains form the backdrop. Thus, there will be a broad field of vision at the front.

In looking at the configuration of elements in a space, it is more appropriate to describe the ideal Feng Shui location as a semi-enclosed space surrounded by mountains at the back, on the left, and on the right, with the front part open. Overlap is an essential cue for depth perception, thus, the configuration of overlapped surrounding mountains and hills help to offer plenty depth cues on the ideal Feng Shui site (in Ke, 82).

The ideal Feng Shui location manifests the concept of prospect-refuge as proposed by Appleton (Ke, 82). The surrounding mountains form a natural defense and a shelter against exposure to cold northern winds, and detection and attack by enemies. Furthermore, the prospect at the front also helps to spot the approaching enemies from a great distance (Ke, 82).

*Focal Point*

Focal points are groupings of features, which create points or sub areas of dominance, and catch people’s attention (in Ke, 83). In the ideal Feng Shui location (called Hsuan Wu), the foremost obvious focal point is a magnificent mountain in the background. Secondary focal points are two slightly lower mountains located to the left, called Ching Lung, and to the right, called Pai Hu. Though they flank the sides of the big mountain, it is not easy to ignore their dominance (Ke, 83).
Ground Texture

In the center of the ideal Feng Shui location, there is usually relatively flat grassland area with smooth ground texture. This provides space so that people can move about easily and it also is convenient for farming, grazing and construction. Also, an even-textured foreground supports a stronger perception of three-dimensional features (in Ke, 83). The even-texture of the grassland extends to the feet of the surrounding mountains. Beyond the mountain foothills, it changes gradually to shrubs and trees; however, the overall scene appears smooth and uniform in the long distance view (in Ke, 83). Thus, in general, the character of the textural surface in front of the Feng Shui focus is visually smooth and continuous (Ke, 83).

Water and Vegetation

Ancient Chinese believed that Chi is accumulated by water, thus water is considered as an important indicator of good Feng Shui. An ideal Feng Shui location usually possesses a winding inward river, which could bring in fresh air, and humidity, and it is also vital to nourish vegetation.

According to Feng Shui theory, plants can bring propitious spirits, drive out evil spirits, and enhance the vitality of Chi. They can release pressure, offer spiritual reconnection by symbolizing noble characters, serve as natural barriers, filter dust and reduce noise. Also, when people are surrounded by plants, they can unconsciously receive treatment by absorbing healing substances emitted from plants.
Plants are categorized into different groups according to their magnetic fields. Based on Feng Shui theory every object has its own magnetic field, which interacts with fields from surrounding objects. This interaction can have an overpowering or regenerating effect.

Feng Shui theory also outlines the connection between plant characteristics and body parts and conditions. For example, plants with black or dark colors could benefit kidney, such as pines, cypress, syzygium jambos and herba ecliptae. Plants with red flowers could benefit the heart or nerves, such as pomegranates, ceiba, raspberries, maple, and all grasses of Cochinchinese excoecaria.

In terms of healing function, there is still a lot of ambiguity about how much benefit plants bring about. In an article by Huang (1994) an interesting experiment was noted. A researcher connected a cancer patient with a healthy plant by wire, assuming that the xylem and phloem part of a plant belongs to different electrodes. After several months, the cancer tuber being detected had shrunk in size; while the plant being connected showed some unhealthy symptom (19). However, the validity of the science behind the theory that plants can cure patients through their magnetic fields needs further research.

**Health preserving in Daoism**

Daoism is a religious-philosophical tradition that has shaped East Asian life for more than 2000 years. This tradition impels adherence to searching for an optimal way to live a harmonious personal life in relation to cosmological and natural
spheres. “This concentrated interest in the well-being of the individual as an integrated organism within the context of his cosmological, natural and social environment has shaped and permeated Chinese thoughts all through the centuries” (Arthur, 95)

The central Daoist concept is Wu-Wei. Translated this means action through inaction. This doctrine urges adherents to harmonize their actions with the flow of life and the natural order of things. Longevity is a primary concern for some Daosits (in Ute, 73). “The practice of Longevity techniques means mainly to preserve vitality and fend off potentially harmful influence, aiming to nourish and prolong life” (Ute, 74). Prolonging life has been an important concern for Daoists of all different schools, and persistent efforts to help longevity techniques reached the peak in Daoism (Ute, 100).

Under the influence of Daoism, the early tradition of health preservation includes techniques to absorb or to guide the Chi, including breathing exercises, sexual hygiene, therapeutic gymnastics, massages, dietetics and drugs. All of this is for the purpose of maintaining and replenishing vital forces. Also, the Daoism texts provide advice for everyday life, such as the regulation of sleep, hygiene, food, activities, movements, and so on. This serves to harmonize daily routines and avoid harmful excesses to the body (Ute, 75).

The healing exercises in Daoism are traditionally called Daoyin. According to Ikai (2003), “Dao means to regulate Chi or vital energy by guiding its flow in the body. Yin means to limber up the body and limbs through physical movement” (34).
The ultimate goal of Daoyin is to “establish harmony with the Dao in the body, realizing the inherent polarity of Yin and Yang and aligning oneself with the cosmos” (34). More specifically, Daoyin involves gentle movements of the body in various positions together with deep breathing and mental focus, which guide Chi as it circulates around the channels (Livia, 12).

The most acknowledged healing exercises developed by Daoists is Qigong, which is a healing method through Chi Exercise. It describes a movement of longevity and semi-meditative practices that has spread widely in China since the 1950s. There are various types of activities created by followers, including gymnastics, breathing techniques, the guiding and circulation of Chi, as well as quiet meditations and visualizations (in Ute, 83). These practices have proven to be successful in health maintenance and treatment of chronic ailments, especially those of the digestive and respiratory system (Ute, 83). After the Cultural Revolution in China (1966-1976), Qigong masters developed new practices of their own, which places greater emphasis on body movement. Examples, like Guo Lin’s “Xin Qigong Liao Fa” (New Qigong Treatment), have been specifically used to treat cancer (Ute, 83).

Some Qigong practices have exercises that are used to control and regulate breathing, which helps people inhale refined, vital Chi while exhaling its impure, gross counterpart. These practices are aided from various breathing methods. Effects are tied to controlling excessive emotions and prevention of imbalances of one’s physical well-being. Excessive emotions and imbalances can result in other
harmful effects, such as inflammation, high blood pressure, excess moisture and heat (in Ute, 15).

Dynamic exercise is also a part of the Qigoing approach. The most widely spread dynamic exercise is Five Animals Frolics developed by a third-century physician Hua Tuo. This consists of a set of Qigong exercises that mimic movements, attitude and bearing of five different animals: the fierce and untamed tiger, the graceful deer, the steady and lumbering bear, the agile monkey, and the flying crane. The complete system develops grace and flexibility, and strength and balance, and is aimed at promoting the circulation of Chi (Ken).

The most well-known animal-based exercises are Bear Amble and Bird Stretch. The Bear Amble (see fig. 2) is walking in a stately fashion with arms swinging, and the Bird Stretch requires one to bend forward with hands on the floor and head raised. Other examples include two monkey poses known as the Gibbon Jump and Monkey Bawl, two bird poses known as the Merlina and Crane Call, and two animal poses known as the Dragon Rise and Turtle Move (Livia, 38-39).
There is a correlation between the Five Animal Frolics, which has a one-to-one relationship to internal organs, and the Five Elements of Chinese Medicine. The relationships between the exercises and internal organs are shown in the table 1.

Table 1 Five Animal Frolics and Its Correspondence to Five Phases Theory

<table>
<thead>
<tr>
<th>Animal Frolic</th>
<th>Element</th>
<th>Yin Organ</th>
<th>Yang Organ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bear</td>
<td>Wood</td>
<td>Liver</td>
<td>Gall Bladder</td>
</tr>
<tr>
<td>Crane</td>
<td>Fire</td>
<td>Heart</td>
<td>Small Intestines</td>
</tr>
<tr>
<td>Monkey</td>
<td>Earth</td>
<td>Spleen</td>
<td>Stomach</td>
</tr>
<tr>
<td>Tiger</td>
<td>Metal</td>
<td>Lungs</td>
<td>Large Intestines</td>
</tr>
<tr>
<td>Deer</td>
<td>Water</td>
<td>Kidneys</td>
<td>Bladder</td>
</tr>
</tbody>
</table>

**Traditional Chinese Medicine**

“Chinese medical concepts generally reflect the central theme of Chinese culture, which can best be characterized by a dialectic interaction between the idea of Dao and a strong pragmatic material orientation” (Lin, 95). This is also the focus of Confucianism and Taoism. The Chinese medical system practices a rational, empirical and systematically synthesized healing practice. Scholars have indicated that the development of Chinese medicine had been a critical, ongoing process, which involves observation, speculation and also conceptual elaboration. Quite often the practice was proved surprisingly objective and therapeutically effective (in Arthur 95).

Microcosm-macrocosm correlations (tian-ren-he-yi) and dynamic balancing or harmony (t’iao-he) appear to be the two most central concepts of Traditional Chinese medicine (in Arthur 96). As noted previously, the early Taoists were devoted naturalists. They considered human beings (the terms body and psyche should be avoided, as they represent a Western dichotomy) as part of the natural world, and “believed that what was observed in the macrocosm should have its counterparts in the microcosm.” Hence, whatever happened in the larger natural and social environments should have correspondently brought about an effect on the smaller human sphere of the individual (Arthur 96).

In the practice of Traditional Chinese Medicine there was also a complex system developed to describe the corresponding relationship between astronomical systems, seasons, weather, and time, as well as the internal organs,
functions, sensations, and emotions. From this framework there evolved three main themes of fundamental importance: the Yin-Yang system, the Five Evolutive Phases, and the Jing-luo (meridian) system (Arthur 96).

The fundamental principle that governs both macrocosm and microcosm is the concept of balance and harmony. Change is considered unavoidable, and as a basic rule of the universe; accordingly balance (harmony) is not only static, but constantly dynamic. However, as there is always a certain level of regularity that involves both macrocosm and microcosm; cyclicity and circulation are primary considerations in maintaining this balance (harmony) (Arthur 96).

In the following text Jing-luo (meridian), Yin-Yang and Five Evolutive Phases are further explored:

**Jing-luo (meridian) System**

In traditional Chinese medicine, Jingluo refers to a system of channels within the human body, through which the Chi and blood circulate. Those channels also connect internal organs with superficial organs and tissues, making the body an organic whole. Specific points located on the body’s surface are the locations where vital energy of internal organs reach. For example, when one is ill, the physician will puncture certain points on the patient’s body surface, thus the flow of vital energy is regulated, and the illness of the associated internal organs is cured (Wei, 86).

**Yin and Yang**

The theory of Yin and Yang is present in almost all important Chinese beliefs, including Confucianism, Taoism and Chinese geomancy; it is even in aspects of
Chinese art. Generally, Yin and Yang can refer to any complementary pair -- they exist in direct relationship to each other; just like we cannot have north without south, or we can feel heat compared with something less hot. According to traditional Chinese Medicine, Yang signifies the apparent, active, excited, external, upward, forward, aggressive, volatile, hard, bright, and hot; it also signifies the abstract and functional. In direct contrast, Yin signifies the passive, inhibited, unclear, inward, downward, retrogressive, cold, dark, soft, and unaggressive; it also signifies the material and concrete (Arthur 97).

Five Evolutive Phases (Wu-Xing)

The dynamic and functional nature of Chinese medical theory is apparent in the choice of the term Wu-Xing, which means a condition of constant change and progression. This concept originated from astronomical observation (from the five planets that can be seen by the naked eye), from the composition of the inorganic world (metal, wood, water, fire and earth); its macrocosm-microcosm correlation is evident when it is applied to human beings and medicine.

The simple rules of sequentially facilitating and inhibiting relationships, as applied in the Five Evolutive Phases, contribute to an intricate system of interdependence and mutual regulation (Arthur 98.). Figure 3 illustrates this interdependence.
The Chinese apply Five Evolutive Phases extensively to macrocosm (specifically in forms of astronomical movement, seasons, geographic orientation, weather, colors, geomantic configurations) and microcosm (specifically in forms of internal organs, sensory organs, secretions, tastes, psychological functions) (Arthur 100). The corresponding relationships between the Five Evolutive Phases, and internal and external organs, tastes, colors and psychological functions are shown in table 2.
Table 2 Five Evolutive Phases and Its Correspondence

<table>
<thead>
<tr>
<th>Five Evolutive Phases</th>
<th>Internal Organs</th>
<th>“Orifices”</th>
<th>Tastes</th>
<th>Colors</th>
<th>Psychological Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood</td>
<td>liver, gall bladder</td>
<td>Eye</td>
<td>Sour</td>
<td>Blue</td>
<td>Anger</td>
</tr>
<tr>
<td>Fire</td>
<td>Heart, small intestine</td>
<td>Tongue</td>
<td>Bitter</td>
<td>Red</td>
<td>Happiness</td>
</tr>
<tr>
<td>Earth</td>
<td>Spleen, stomach</td>
<td>Mouth</td>
<td>Sweet</td>
<td>Yellow</td>
<td>Desire</td>
</tr>
<tr>
<td>Metal</td>
<td>Lung, large intestine</td>
<td>Nose</td>
<td>Spicy</td>
<td>White</td>
<td>Worry</td>
</tr>
<tr>
<td>Water</td>
<td>Kidney, urinary bladder</td>
<td>Ear</td>
<td>Salty</td>
<td>Black</td>
<td>Fear</td>
</tr>
</tbody>
</table>


Traditional Chinese Medicine also offers dietary recommendations in terms of health preservation. The Five-Element associations (see table 3) are closely related to the flavor of food, which provides insight into the therapeutic dimensions and actions of food. Flavors correspond to the thermal nature of food (warming/cooling value) and the various remedial actions (moistening, drying, astringent, purgative, antibiotic, dispersing, etc.) (Paul 309). For example, pungent flavors belong to Yang flavor; it is expansive and dispersive. When the pungent flavor has a warming energy, it stimulates circulation of energy and blood, with a tendency to move energy upwards and outwards to the periphery of the body (Paul 310).

In terms of organ function, the pungent flavor enters and clears the lungs of mucus conditions, improves digestive activity, moistens the kidneys, stimulates blood circulation, helps clear obstructions, and improves sluggish liver function.
Table 3 further illustrates the corresponding relationship between the Five Elements, Yin and Yang, the human body and natural elements.

<table>
<thead>
<tr>
<th>Human Body</th>
<th>Nature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Five Elements</strong></td>
<td><strong>Wood</strong></td>
</tr>
<tr>
<td>Yin Solid Organ</td>
<td>Liver</td>
</tr>
<tr>
<td>Yang Hollow Organ</td>
<td>Gallbladder</td>
</tr>
<tr>
<td>Sense Organ Sense</td>
<td>Eyes/Sight</td>
</tr>
<tr>
<td>Tissue</td>
<td>Tendons And sinews</td>
</tr>
<tr>
<td>Emotion</td>
<td>Anger and impatience</td>
</tr>
<tr>
<td>Voice Sound</td>
<td>Shouting</td>
</tr>
<tr>
<td>Fluid Emitted</td>
<td>Tears</td>
</tr>
<tr>
<td>Paramita</td>
<td>Patience</td>
</tr>
<tr>
<td>Season</td>
<td>Spring</td>
</tr>
<tr>
<td>Environmental Influence</td>
<td>Wind</td>
</tr>
<tr>
<td>Development</td>
<td>Birth</td>
</tr>
<tr>
<td>Color</td>
<td>Green</td>
</tr>
<tr>
<td>Taste</td>
<td>Sour</td>
</tr>
<tr>
<td>Orientation</td>
<td>East</td>
</tr>
<tr>
<td>Grain</td>
<td>Wheat, oats</td>
</tr>
</tbody>
</table>

Notes:
Paramita in Sanskrit means *to go across*, often in the sense of crossing a sea of pain and suffering. Here the paramitas are ways to correct imbalances in the Elements. For example, in the Wood Element, anger is overcome with patience; in Earth, weakness in the spleen-pancreas and stomach can be helped by giving. The paramita of *keeping moral precepts* means to hold the five traditional precepts of avoiding killing, lying, stealing, sexual misconduct, and intoxicants. A good moral foundation supports a strong biologic foundation.
Traditional Chinese Garden Design

Chinese gardens are renowned for their tranquility and delicacy, and they have been designed to reflect both the charm of nature and the ancient Chinese view of life. For centuries the Chinese have sought inspiration and self-knowledge in nature, which has contributed to their garden designs: they evoke the natural world. Since land has always been expensive in cities, urban gardens were usually relatively small. However, the spaces in Chinese classic gardens, especially in private Chinese garden, decorated with rocks, plants and water, appear much greater in size than in reality. This owes to the clever ways in which garden designers lead the visitor from one unique vantage point to another.

Hospitals in urban setting are facing similar problems: shortage of land, lack of green space and insufficient opportunities to connect patients with nature for. Hence, traditional Chinese garden design provides valuable examples and insight that could be drawn upon when designing the hospital landscape. The following touches on the theories and artistic concepts behind Chinese classical gardens, and their distinctive combination of nature, philosophy and art.

Design techniques of traditional Chinese garden

In terms of generalizing Chinese garden design, the masterpiece is a book called Yuan Ye (The Garden Treatise) by Ji Cheng, published in 1634. Out of the many publications at that time, The Garden Treatise is considered the definitive
work on garden design. This book reveals some guiding principles used in private Chinese gardens. However, the application of these guidelines varied, depending on who used them. The general detailed design techniques included site analysis, dividing, sequence, borrowing, contrasting and seasons.

*Site Analysis (Ji Cheng, 1634, 56-68)*

According to Chi Cheng, the most important design principle of the private Chinese Garden is that one should follow the natural line of the land to obtain good views. In order to create the best design, Chinese gardeners should first investigate and extensively explore the natural landscape resources of the site, seeking inspiration from the site’s distinctive characteristics. Historically, Chinese gardeners would not destroy the existing conditions of the site. Instead, they were to simply improve the site while attempting to retain its natural charm.

If the site itself was on ordinary land without favorable qualities, the Chinese gardener would pay attention to surrounding environment (off site) in order to find any available scenery feature that could be borrowed, such as a Tao Temple on a remote hill, a pavilion beside a lake, or flowers in a neighboring garden.

Chinese gardeners would spare no effort in taking advantage of natural resources. Water was seldom introduced in private gardens artificially. Detecting natural water supplies was usually a top priority while conducting site analysis. Fortunately, in the southern part of China there was an abundance of water resources. Therefore, private Chinese gardens in this region could usually keep well-balanced ecosystems with little maintenance.
Chinese Gardeners used walls to screen off the hubbub from surrounding streets, which helped create a more natural garden environment in urban settings. The walls that kept the garden a secluded place were usually hidden by layers of trees or rockery to avoid the feeling of human construction.

**Dividing**

The most common problem of private Chinese gardens was the shortage of land in urban settings. Thus, the entire private Chinese garden was usually divided into several scenic sections, each of which had its own thematic character and was semi-disclosed from the others. The scenic sections were arranged in special sequence, and visitors attracted through a series of vantage points located in different scenic sections. In other words, the entire garden was divided, but not separated. Thus, visitors would feel an expansive area in a restricted garden space. Figures 4 and 5 illustrate the relationship between divided spaces, overlaps of different areas.

![Fig. 4. Space Dividing Diagram.](AllChinaNet.Com. 2000. Web. 11 Feb. 2012.)
Having many different and varied sections and views in a garden was beneficial to both the designer and visitor. A Chinese gardener, for example, could freely arrange multiple natural views in order to achieve a feeling of an idyllic landscape. The subdivided sections inside the garden could also meet various functional needs of the visitors. The central section was usually a place for group activities, such as a family party and gathering, or entertaining friends. Thus, the central section always boasted the most dominant landscape scene equipped with a sizable main hall called Ting or Tang. The subordinate elements could be a simple meandering streamlet, an artificial hill, a pile of rocks, or a specimen tree planted before rockery caves. This way, visitors could find their own corner to relieve the pressure from outside world.

Walls were the most common feature to demarcate one special segment from another. As well, rockeries, group of trees, sides of buildings, and even two adjoining pillars of an open pavilion could also separate spaces.

In order to avoid a feeling of being too closed in when space was divided into
several sections, Chinese gardeners used stratagems of walling in and penetrating at the same time. Hence, spaces in private Chinese garden are never completely separated, but are partially separated and partially connected. When visitors are inside a section, they always have an opportunity to get a glimpse of a neighboring section. This technique of partial revelation of a scene is called *Lou Jing*— the divulging scene. Examples of this are features like decorated doors, latticed wall openings, and lower walls. Partial discloser of a space not only intrigues viewer’s interest for further exploration, but also creates an illusion that a space is larger than its actual size (Chinese Garden Design Techniques, 2000).

Chinese gardeners not only apply the technique of divulging scenes horizontally, but also vertically. A vertical section along the rise and the fall of the site’s topography is often utilized. Examples include a terrace rising above another, a pavilion built on the peak of an artificial mountain or a stone bridge lower than ground level (Chinese Garden Design Techniques). Examples of the vertical change made by piles of stone or a pavilion on the top of an artificial hill are seen in fig. 6.

![Fig. 6. Scenes of Vertical Change. ; “Chinese Garden Design Techniques”](image)

Sequence

In Chinese gardens, because scenes are concealed inside different scenic sections, revealing them happens in a sequence along paths. To imitate nature, paths in Chinese garden are never straight or symmetrical. Instead, they are usually winding, free and irregular, like serpentine paths, zigzag bridges and winding stone steps. As a result, walking from one scenic section to another, a person usually has to cover a much longer distance along the meandering paths than if the paths were straight. Hence, winding paths actually prolong the travel distance and time. The design of winding path is another major technique to create a feeling of spaciousness within a limited space. Figure 7 illustrates that the view towards the pavilion is revealed and then disclosed along the path.

The scenic spots in private Chinese gardens are designed for static, dynamic, or lingering observation. The resting stops along paths for static viewing of focused scenes are an open pavilion beside a path, a small stone chair beside a pond, or a terrace in front of a main hall. Many enchanting scenes along the paths are designed for close observation and to attract visitors for further exploration. Thus, Chinese garden art is an experience of time. Repeated occurrence of the same scene rolled out in different angles and in various sequence makes a private Chinese garden seem more extensive than they really are (Guo, 32).

The sequencing approach was firstly applied in Chinese painting. Usually Chinese painters did not use a single viewpoint and vanishing point in their paintings; rather, they used many viewpoints and vanishing points together in one painting. This allowed them to visually describe a more holistic feeling of the landscape, not only a single scenic view. Hence, strolling along paths in a Chinese garden feels much like one is unrolling a Chinese landscape scroll views change at every step, exploring the whole garden scenery step by step through time and space (Chinese Garden Design Techniques). Figure 8 illustrates this concept.

Paths in a Chinese garden also vary in width and materials in an attempt to enrich feelings and activate different experiential sensations. Garden tracks and paths are also arranged along vertical changes. Most of the time, they wind naturally up and down slopes. They are found next to water, at the foot of a hill, along winding corridors, and in the forms of undulating stone steps or zigzag mountain paths. The irregular pattern of changes in height provides beauty whether looking upward or downward. Wandering in a garden, one could look up to enjoy the vastness of the sky or downward to enjoy the vistas below, including changes of landform or elevation. Due to the change both vertically and horizontally, Chinese gardens are full of charm and wit and visitors can benefit from fresh visual beauty from each angle (Lou, 154). Figure 9 illustrates how the landscape on both sides of pergola is arranged in a sequence for both static and dynamic viewings.

Fig. 9. An Example of Scenic Spots. ; “Chinese Garden Design Techniques”.

Borrowing

According to Yuan Ye (243-250), scenic resources are always limited in a Chinese garden, so an investigation and incorporation of natural landscape from outside the site is necessary. Examples to look for include mountain silhouettes, temples, a pagoda located on a remote hill, a floating fishing boat in the distance, or flowers or specimen trees from neighboring garden. In places where there are no inviting landscape features worth borrowing, Chinese gardeners usually create artificial mountains or place groups of trees or other architectural structures to screen off unfavorable views. However, Chinese gardeners first try every means to borrow any possible intriguing features. As shown in figure 10, the landscape outside a window or on the other side of a pergola far away could be borrowed, using windows or pergolas to frame the view.


Scenery that is borrowed (from within the garden or the surrounding context) is arranged to blend with the garden scenery. As a result, the garden boundary is extended far beyond its limits to the outer landscape, and the space within the
garden is multiplied simultaneously. It is hard for the visitor to distinguish whether these beautiful outside landscape belong to the garden or the garden is just an extension of those landscapes. Figure 11 is an example of this, showing the view toward pavilion on top of an artificial mountain, framed by the pergola where visitors are lingering.

![Fig. 11. A Borrowing View of a Pavilion. “Chinese Garden Design Techniques”](image)

Inside a Chinese garden, a scenic section can be partially borrowed from another. This inspires viewer curiosity, encourages exploration, and enlarges the confined garden space.

Water is another element utilized to enhance borrowed scenes. It can reflect clouds, the moon and stars, or trees and architecture on the lakeside; in this way, the scene and the garden space is visually widened (Chinese Garden Design Techniques).

Contrast

Contrast is a common technique applied to a lot of forms of Chinese art. For
example, Chinese landscape painters usually will leave a large blank area as *void space* to contrast with the detailed portion of the painting as *solid space*. Also, they use little color in their paintings. Thus, most of the visual effect is achieved by wet and dry ink drawing techniques. The *wet* technique refers to a dip of ink being highly diluted with water, which is mainly to draw or to wash the *void* sky, water or distant mountain. The *dry* technique refers to a dip of ink just being slightly diluted with a little water (or sometimes no water), which is used to express solid objects, such as detailed mountains, trees and figures (Chinese Garden Design Techniques).

Most Chinese garden designers are highly educated poets, scholars or former official governors, and they all have a good understanding of art. Because they are educated in the arts, contrast is extensively practiced in all aspects of Chinese gardens, from the spatial arrangement to the detailed design of a particular object (Li, 89).

When viewing the entire layout of a private Chinese garden, the most dominant scenic section is comprised of the largest space and the most attractive landscape features. This area contrasts to the confined and unpretentious subordinate sections. Winding paths, zigzag corridors intertwined with small, unobtrusive corners are always distributed around the central section. Thus the impressive scenery of central section stands out and the main theme of the garden is maintained. Even among those subordinate sections, one section always contrasts to another. A bright and open one is always next to a comparatively closed and dark one. Generally speaking, a visitor should pass through a narrow,
dim, and seclude space before entering a much broader, bright and open space, thus the feeling of spaciousness in the later section is amplified. The trick of contrast dramatically intensifies the beauty of Chinese gardens.

The technique of contrast also helps to make a particular garden scene more captivating. If a scene is designed to emphasize its height and size, then the surrounding elements should be kept low and small as a contrast. There are always some rough, convoluted and dark rocks erected surrounding a lake to contrast the smooth, clear and bright water surface (Chinese Garden Design Techniques).

Seasons

Seasonal interest is also an important design technique, which includes “the aroma of peach and plum blossoms in spring, the faint scent of lotus in summer, the sweet smell of orange osmanthus in autumn and the delicate fragrance of calycanthus in winter” (Lou, 155). There are two other particular seasonal features intriguing visitors in Chinese gardens: the shadows of shaking branches on the white wall during winter, and the sound of rain dropping on banana leaves in autumn. As the seasons pass, the changing of scenery in Chinese gardens reminds observers of time passing, which helps them to live in harmony with the rhythm of nature (Chinese Garden Design Techniques).

“The famous scene of rain dropping on Japanese banana has evolved into a rhetorical literary quotation. During cloudy days, it’s a very special experience to savor the solitude and serenity alone while listening to the silvery sound of rain dropping onto the wide Japanese banana leaves” (Lou, 155). This is how the phrase
“the listening to Rain Hall” became associated with the Humble Administrator’s Garden in Suzhou. The Pine Wind Pavilion in the Humble Administrator’s Garden also features acoustical aspects (see fig. 12). Wind whispers through pines planted beside the pavilion offer a sense of vastness and tranquility. Thus, planting pines for listening to the wind and growing Japanese banana for listening to rain have become important features of Chinese garden design (Lou, 155).

Fig. 12. Photos of Rain Dropping on Japanese Banana and Pine Wind Pavilion;


**The application of traditional materials in landscape design**

According to ancient animistic beliefs, rocks were the earth’s skeleton and rivers were its arteries, living elements. They together were complementary in the harmony of the cosmos. Water and mountains represented the fertile juxtaposition between yin and yang, and the dualism of the feminine and masculine aspects represent in all natural phenomena. The robust vigor of rocks evinced the solid masculine element, while water’s fluidity suggested the changeable feminine (Bianca, 75).
The multiple, strong connections between belief and natural elements have resulted in the use of mountains and bodies of water in every Chinese garden. In fact, the successful integration of these two elements is considered the primary achievement for gardeners. To complement these cardinal elements plants are added to introduce the passage of time and the dimension of seasonal cycles.

Pavilions dispersed within the garden serve as transitions between architecture and nature, and also denote human “poetical interpretation of the landscape” (Bianca, 75).

Chinese gardens achieved a harmonious environment through a balance of Yin and Yang energies, where they complement and contrast in impressive beauty via four main elements, bringing about a sensual and spiritual experience. The four elements incorporated in Chinese garden design are water, stone, plants and architecture.

**Water**

Water represents the Yin energy and serves as the living pulse of the garden. The horizontal surface of water, contrasted with vertical stones, makes it the second foundational elements of Chinese Garden. A still, reflective, large body of water conveys a sense of spaciousness. Moving water denotes a sense of dynamism and vitality of life, and adds dimension of sound and awakens all senses of experience for visitors. Also, water helps to improve the local microclimate (Bianca, 81).

**Stone**

To balance of the Yin energy of water, Yang energy is represented by rocks in
the form of mountains. A strong appreciation of the aesthetic beauty of rocks has
developed among Chinese, and collecting of them became a trend among
cultivated gentlemen (this trend began in the middle of the 2nd century and
reached its peak in the 5th and 6th centuries) (Bianca, 75).

Rock placement takes two main forms: single rocks and rock compositions.
Rocks placed singly as sculptures are required to be slim, jagged and polyporous.
Other less special rocks are piled up into an artificial mountain structure or used to
create a rocky shore of a lake or watercourse. The Chinese usually associate eternity
with rocks, this is because the grotesque shape of rocks eroded by water and wind
reminds people of the passage of time (Bianca, 75).

Plants

Plants are used to highlight the progression of seasons, and to soften the hard
surfaces of stone and architectures; they are also associated with “human
temperaments or characteristics such as loneliness, chastity and tenacity” (Lou,
142). For this reason plants are important in Chinese garden design, and
throughout history there are many writings and paintings dedicated to them.

“Pine trees are mighty and sturdy; bamboos are straight and gnarled” (Lou,
142); chrysanthemum grows beautifully in late autumn, as do orchid and plum
blossoms in the cold of winter. Thus, Chinese scholars designated pine, bamboo,
plum blossom and chrysanthemum as the “four gentlemen,” and pine, bamboo and
plum as the “three friends in winter” (Shu, 44).

A famous Tang Poet Bai Juyi (born, 772, died 846) summed up the merits of
bamboo: its deep root represents resoluteness, its tall straight stem denotes
honesty, its hollow interior symbolizes modesty and its clean and Spartan exterior
exemplifies chastity (Huo, 2003). Ancient Chinese held bamboo in profound esteem.
Su Shi, a literary giant in the Song Dynasty, was famous for his love of bamboo. He
once wrote, “It is possible to dine without meat, but [one] cannot live without
bamboo. Eating no meat makes people thin, but without bamboo people will
become vulgar” (Lou, 142).

*Architecture*

Though architectural buildings occupy large portion of Chinese gardens, they
do not appear obtrusive in overall layout. The varied color of buildings and their
airy structure, embellished with latticework and openings, enhance transparent
qualities.

Irregular forms created by rocks and water deliver a dialectic style in contrast
with the regularity of architectural structures. Architectural elements are intended
to contrast with the garden’s natural elements, and serve as a complementary
ingredient through form and placement. The arrangement of architectural elements
still follows the general logic of surprise, leading visitors to have scenic units
gradually revealed. Other architectural elements include winding corridors to
storied pavilions, and from diverse types of pagodas, to varied shapes of walls. The
elements function for different purposes, like resting, meditating, or simply
stopping. Some larger spaces serve as tea rooms, libraries, studies or guest-lodging
(Bianca, 94).
Conclusion:

The central ideas of Chinese medicine, Daoism theory and geomancy have many connections and overlaps, and they all emphasize holistic harmony. The principle tenet, an interwoven relationship between human beings and nature, provides a principle guide for the design of healing landscapes in medical settings. Additionally, there are several aspects from these sources that can be integrated into the design of healing landscapes, including the provision of space for healing exercises (Daoism), recommendations for site selection and reconstruction (geomancy), and the Five Phases system.

Chinese classic garden design techniques and traditional materials used in this process also offer key solutions for the design of urban hospital grounds. In addition to providing ideas for the design of small spaces, numerous opportunities are made possible for significant cultural connections by using traditional materials in this process. All of these practices and beliefs combine to support spiritual communication with and in nature, which is a central goal of ancient medical practice in China.
CHAPTER 3 CASE STUDIES

To expand my understanding of therapeutic gardens associated with health care institutions, I engaged in site visits to healthcare landscapes in both Western and Eastern countries. This chapter provides an overview of different hospital grounds visited in for this creative project. The Western hospitals in this reporting were located in the United States (California, New York, and Boston). The Chinese hospitals were located in Wuhan, Shanghai, and Hangzhou.

The renewed interest in how outdoor environments supported health and healing happened earlier in the Western world than in the East, so there are more contemporary examples of therapeutic gardens in the United States than in the China. Visits to the hospitals in the United States revealed carefully designed spaces that were universally accessible in aspects of width, slope and flatness of the terrain, and there were many examples of gardens that offered patients a sense of control. These outdoor spaces varied in size, with even small spaces providing comfortable, movable seating options. Additionally, garden views from different buildings were often present.

In China, because of land scarcity, most available space in-between buildings
has given way to parking lots and roads; the few green spaces left are usually used to buffer between buildings and traffic. The only places boasting large patches of green space are the sanatoriums located in suburban areas. Consequently, most of my observations were of general hospitals in urban settings. However, in two cases I visited sanatoriums; though sanatoriums belong to another type of medical institution, here I found clues about how traditional Chinese culture can be integrated into the design for healing environment.

*Western Hospitals*

Due to restrictions of time and money, the case studies of Western hospitals were limited to those in the United States. The hospitals I visited varied in both scale and technology level. Some of them were large general hospitals with several gardens and plazas, while others had only one refined small garden.

The following healthcare institutions were visited: City of Hope Comprehensive Cancer Center (Duarte, CA), Glendale Adventist Medical Center (Glendale, CA), Rusk Institute of Rehabilitation Medicine Center (New York, NY), San Diego Hospice (San Diego, CA), Scripps Memorial Hospital (San Diego, CA), and Massachusetts General Hospital Cancer Center (Boston, MA).

*City of Hope Comprehensive Cancer Center*

The City of Hope Hospital, located in Duarte, CA, USA, has richly landscaped gardens, both informal and formal, on its 100+-acre campus. Plazas, meditation gardens, and a sculpture garden are all present, providing patients, visitors and staff with places to find solitude and relaxation.
The Plazas

**Spirit of Life Fountain Plaza**

Site Location: Near entrance of the Medical Center

Description:

As shown in figure 13, a fountain sits in the middle of this plaza with a sculpture depicting City of Hope’s belief in the sanctity of life, and the fundamental role family plays in fostering health and well-being. Behind the fountain there are several benches for resting. The fountain screens off noise from streets but also offers nice view. The location provides immediate access for visitors, patients, and staff to rest.

![Sculpture Fountain. Benches behind Sculpture Fountain.](image)

**Graff garden plaza**

Site Location: Medical Center entrance

Description:

As shown in figure 14, the rows of planters in this plaza block views of the...
surrounding traffic and contribute to defining a safe walking space. Its location offers sitting opportunities for rest on the way in and out of the hospital. The central axis orients toward the fountain in the Spirit of Life Fountain Plaza, forming a continual landscape view.

View towards the entrance.  View toward Outpatient Building.

Planters with seats

Fig. 14. Graff garden plaza, Photo by Shuping Yu
The Meditation Gardens

Japanese Garden

Site Location: Next to the Sunny and Isador Familian Multidisciplinary Science Building

Description:

As illustrated in figure 15, this is a small, quiet and enclosed space, composed of a waterfall, a wooden bridge, a wooden pergola and a small pond. It has dense vegetation, which provides comfortable spaces in a hot climate. The flowing water represents turbulence and the pond with beautiful Koi fish represents tranquility. Visitors to the garden can think and rest, and enjoy the vitality of swimming fish.

Wooden bridge surrounded by lush vegetation.  Cascading water.

Fig. 15. The Japanese Garden.; City of Hope Points of Interests; cityofhope.org; 2012; Web; 7 Mar. 2012.
International Garden of Meditation (Rose Garden)

Site Location: At the northern boundary of the City of Hope grounds

Description:

Figure 16 illustrates winding routes bordered with rows of roses (the garden has more than 2,000 rose bushes), offering multiple opportunities to touch and smell roses. Shady spaces are also present, for meditation. The wrought iron Golter Gate is inscribed with City of Hope’s credo, “There is no profit in curing the body if in the process we destroy the soul.” This transmits a message that spiritual comfort.

Fig. 16. Rose Garden, Photo by Shuping Yu
Informal Garden

The Sculpture Garden

Site Location: West of the International Garden of Meditation

Description:

Figure 17 shows large trees and a vast area of green space that has paths for walking and shade for visitors. Sculptures are scattered throughout, where patients can do healing exercise while enjoying many views of nature and sculpture.

Fig. 17. Sculpture Garden, Photo by Shuping Yu
Anniversary Garden

Site Location: Glendale Adventist Medical Center, Glendale, CA

Description:

Figure 18 provides a number of garden views. The Anniversary Garden was constructed in 1980 to celebrate the hospital’s 75th anniversary. The garden is enclosed with a 5-foot wall on one side, a one-story medical office building on a second side, and 5-foot railings on the other two sides. There is no obvious sign for direction; however, the sounds of falling water attract one to the garden.

As illustrated by figure 18, the major feature of this garden is a meandering pond. The pond features rock borders and cascading water in three corners. Seating is provided in several locations, and is made of wood, artificial stone, and plastic.

Another interesting feature of this garden is the entry porch, which is composed of 6-foot stucco wall and a wooden arbor. It works as a frame to direct your view to the main feature before entering the garden.

This garden is featured in Marcus’ book (Healing Gardens). It is noted in this publication that there are many native trees, including pines, sweet gum, camphor, evergreen pear, bottle brush, gingko, carrot wood, and southern magnolia, providing deep and dappled shade for the garden. Trees at the edge of the garden are approximately two stories high and help screen out the three- to six-story hospital buildings. The walkways have a free form, providing easy access around the garden and an approach to the pond (148).
Wooden arbor of the entrance.

Meandering pond. Free-form shaped walkway.

Fig. 18. Anniversary Garden, Photo by Shuping Yu
Rusk Institute of Rehabilitation Medicine Center

*Enid A. Haupt Glass Gardens (Therapeutic garden)*

Site Location: Rusk Institute of Rehabilitation Medicine Center, New York, USA.

Description:

The Enid A. Haupt Glass Garden (opened 1958) is a therapeutic garden that is part of Rusk Institute for Rehabilitation. Originally, the garden was simply a retreat from hospital settings where patients, visitors and staff could connect with the natural environment of plants, water and birds. In the 1970s, one of the nation’s first horticultural therapy programs was introduced into this Glass Garden. The idea was to combine horticultural therapy with medical therapy. Today, patients of all ages work with trained horticultural therapists on activities that help to rehabilitate physical and cognitive functioning as part of their occupational therapy program (Justin McGuire, Enid A. Haupt Glass Garden, ManhattanStyle.com).

Figures 19, 20 and 21 provide various views of this garden. The garden is composed of an outdoor garden and one 1,700 square foot greenhouse. The greenhouse is designed to be completely wheelchair accessible. It has an impressive collection of plants including ferns, orchids, bromeliads, succulents, palms, caudate, and insectivorous plants and this tropical oasis has an aquatic garden, where there are koi, goldfish, turtles, and catfish in the pond (Justin McGuire, Enid A. Haupt Glass Garden, ManhattanStyle.com).

The outdoor garden is located on the north side of the conservatory, and it integrates a playground with a teaching garden, a treatment clinic and a classroom.
for children, family and friends. The play components in playground are designed to increase several skills and abilities, and for fun (Horticultural Therapy - Enid A. Haupt Glass Garden, NYU Medical Center).

Five days a week there are group sessions for patients, which include various activities such as propagating plants, flower arranging and nature craft projects. Through participation in these activities, children and adult patients can meet rehabilitation goals and reduce their stress levels. Further, a sense of personal accomplishment is often achieved, as well as productivity and self-reliance (Horticultural Therapy - Enid A. Haupt Glass Garden, NYU Medical Center).

Fish pond in greenhouse.  Wheelchair accessible in greenhouse.
Worktable for planting workshop. Planter labeled with patients’ name.

Fig. 19. Enid A. Haupt Glass Gardens, Photo by Shuping Yu
Sandpile for children to play. Children’s slide.

Swing Chair available for wheelchair.

Fig. 20. Enid A. Haupt Glass Gardens, Photo by Shuping Yu
Art craft made by patients.

Outdoor space for propagating workshop.

Fig. 21. Enid A. Haupt Glass Gardens, Photo by Shuping Yu
San Diego Hospice

Tribute Garden

Site Location: San Diego Hospice, San Diego, CA

Description:

The San Diego Hospice Garden was designed by Wimmer, Yamada, and Caughey in 2000. This tribute garden is designed more as a strap-shaped plaza, fully open, with benches and plantings nestled on its sides.

This garden sits on an escarpment overlooking a large valley, once the bed of the Sand Diego River and a picturesque ocean-front bay. The pleasant and open view is very effective to reduce stress and smooth the soul. Contemplation that comes with a panoramic view is often sought by people experiencing extremes of stress, grief, or confusion. Here, patients can perceive an expanse of sky and landscape, or cityscape, and obtain a mood-shift, which enables the viewer to “get things into perspective” (Cooper-Marcus, 540, Healing Gardens).

Several views of the gardens are shown in figures 22, 23, and 24, including the parking lot being shaded with native trees. This space has a beautiful specimen tree, and, at the entrance, a shaded, circular pergola connecting buildings creates a safe, comfortable walking system.

According to Naomi Sachs “The grounds offer a plenty of choices for individuals to walk or sit on their own, in small groups of two or three, or for larger gatherings such as memorials” (Therapeutic Gardens in San Diego – San Diego Hospice, Therapeutic Landscape Network.org). There are frequent places for rest along an
easily accessible path winding around the entire main building. Also along the path you can enjoy beautiful planting beds closely and fantastic views in the distance.

Shady pergola at the entrance. Specimen tree marks the entrance.

Inspiriting words inscribed on the pillar. Playground located on the south end.

Fig. 22. San Diego Hospice, Photo by Shuping Yu
Pathway bordered by lush plantings. Nice view along the pathway.

Outdoor café. Memorial wall.

North end of the garden. Memorial wall.

Fig. 23. San Diego Hospice, Photo by Shuping Yu
Fantastic view from the garden.  

Shaded Parking Lot.

A row of shrubs blocks the view to the parking lot. 

Fig. 24. San Diego Hospice, Photo by Shuping Yu

**Scripps Memorial Hospital**

*12-step Garden*

**Location:**  
Scripps Memorial Hospital, San Diego, CA, USA

**Description:**

The 12-step Garden was once an under-utilized and uninspiring outdoor concrete basketball court, and has been successfully transformed into a tranquil
and contemplative healing environment for Scripps Memorial Hospital’s drug and alcohol treatment center in 2001 (12-step Garden. Aesthetics.net).

Figure 25 and 26 show images of different aspects of this garden. There is a symbolic bridge at the entrance to the garden. Inside, the garden is divided into twelve outdoor meditation alcoves, each representing one of the program’s twelve steps. Each step is a different sub-space in the garden with inspiring words engraved into a paving stone, surrounding a labyrinth. Also, each alcove boasts inspirational architectural features such as fountains, seating areas and commissioned artwork by various artists (12-step Garden. Aesthetics.net).

Hospital staff currently makes use of the garden as an important tool which reflects a successful collaboration with everyone involved in its creation (designers, patients, community artists, program graduates, and hospital staff) (12-step Garden. Aesthetics.net).
Inspiring words engraved into a paving stone

Various alcoves designed by artists for meditation.

Fig. 25. Scripps Memorial Hospital, Photo by Shuping Yu
Various alcoves designed by artists for meditation.

Various alcoves designed by artists for meditation.

Fig. 26. Scripps Memorial Hospital, Photo by Shuping Yu
Massachusetts General Hospital Cancer Center

Howard Ulfelder, MD Healing Garden

Location: on the eighth-floor roof of Massachusetts General Hospital’s Yawkey Center for Outpatient Care (Cancer Center), Boston, MA, USA

Description:

The Howard Ulfelder, MD garden was constructed in 2006. This 6500 square foot roof garden, found on the eighth-floor roof, was created as a respite for cancer patients, their family and friends. Hospital staff also comes to this garden for temporary breaks.

As seen in figure 27, every corner of the garden is carefully arranged. A rectangular-shaped water pond with slow flowing water is intended to help people calm down, when they need to cope with the stresses accompanying the treatment of cancer. Also, patients can enjoy a view of the city and the Charles River at the north edge of the garden without being noticed by outsiders. Though the garden is not large in scale, it is nicely and carefully arranged in a way that people can find their own corner to rest and meditate.
An enclosed pavilion for year-round use, Resting corner

Roof garden covered with lush vegetation. Reflection pond.

Resting corner.       View over Charles River.

Fig. 27. Howard Ulfelder, MD Healing Garden, Photo by Shuping Yu
Chinese Hospitals

The hospitals I visited in China vary in both scale and technology level. Some of them represent the top level in the national scene, while some others represent city or regional levels. They also belong to different organizations: some public hospitals belong to the army, and some others belong to government.

In this review the following hospitals are covered: Hangzhou Land Force Sanatorium (a military hospital), Zhejiang Hospital (rank top in city-scale), Ruijin Hospital (rank top in national-scale), Wuhan General Hospital of Guangzhou Military Region (military hospital), Xinhua Hospital of Hubei Province (ranks top at city-scale), People’s Hospital of Hubei Wuhan University (rank top in city-scale), and Xinhua Hospital of Hubei Province (ranks top at city-scale).

Hangzhou Land Force Sanatorium (Military Hospital)

Site Location: Hangzhou City, Zhejiang Province, China

Description:

The Hangzhou Land Force Sanatorium was built in 1953, and is located in Hangzhou City, Zhejiang Province, China. It covers an area of almost 200,000 square meters (2,152,782 square feet). Due to its early establishment and because it is a sanatorium, this place has significant green space. Almost every building is bounded by (at minimum) fifteen meters of green space, for separation from the street. As shown in figure 28 there are planting beds, a pavilion, and a zigzag bridge interspersed among the trees and shrubs.

Four main gardens are found in the green space: a fitness garden, a longevity
garden, a massage garden and an aromatic garden.

**Fitness Garden**

The fitness garden is a strap-shaped garden paved with stones. Two high-rising camphor trees offer shade for the whole garden. Exercise facilities are found on both sides of the garden.

**Longevity Garden**

The most striking feature of longevity garden is an artificial mountain symbolizing longevity (according to Chinese culture). However, the only route to the mountain requires walking up steps, which excludes opportunities for some disabled patients.

**Massage Garden**

In the massage garden, there is a circular foot massage path around a large planting bed. According to Traditional Chinese Medicine, feet are considered the *mirror of the body* because of the nerve endings and reflex points that can be followed to the foot area. These mirror points can be stimulated for the well-being of the whole body. Thus, walking along the massage route while barefoot can help to activate mirror points located in the feet.

**Aromatic Garden**

The aromatic garden is arranged according to the Five Phases Theory. It is divided into five zones, including fire, wood, water, earth and gold, which surround a lake. However, this only superficially addresses the Five Phases Theory in the zoned layout.
Massage route.

Fitness Garden.

Fig. 28. Hangzhou Land Force Sanatorium, Photo by Shuping Yu
Zhejiang Hospital (rank top in city-scale)

Site Location: Hangzhou City, Zhejiang Province, China

Description:

The Zhejiang Hospital, located in Hangzhou City, Zhejiang Province, China, is similar in scale to a sanatorium, covering an area of almost 66,000 square meters (710,418 square feet). It was built in 1954, surrounded by beautiful natural landscape. It has entrance gardens and a viewing garden, as shown in figures 29, 30 and 31.

Entrance Gardens

Because is a large property, quite a bit of its space is devoted to the landscape. Almost every department has an entrance garden, where patients can take advantage of outdoor activities and contact with nature. The entrance garden of the radiology department, for example, has a circular bed planted with flowers and tall trees. The surroundings are planted with shrubs to block the view to adjacent streets. There is also a garden in the lobby of the radiology department. When looking from the inside out, it looks like the entrance garden continues from the outside into the building.

Viewing Garden

The inpatient department is set on the side of a lake, so patients can enjoy a nice view over a distant artificial mountain on the other side of the lake. Every corner of the site, or linear space between the buildings, is designed as a resting spot. The hospital is totally concealed under green canopies of tress, and a
landscape setback surrounds every building. However, some landscape features are not wheelchair accessible.

Entrance Garden of Radiology Dept.

Indoor garden in the Lobby.

Fig. 29. Zhejiang Hospital, Photo by Shuping Yu
Inpatient Dep. located along lakeside. Pavilion on the other side of the lake.

Entrance garden.

Fig. 30. Zhejiang Hospital, Photo by Shuping Yu
Not wheelchair accessible.

Palm shaped chair. Large patches of green space.

Fig. 31. Zhejiang Hospital, Photo by Shuping Yu
Ruijin Hospital (rank top in national-scale)

Site Location: Shanghai City, China

Description:

Ruijin Hospital, located in Shanghai China, was built in 1907. The hospital grounds cover an area of 120,000 square meters (1,291,669 square feet). Because of its early establishment, Ruijin hospital boasts a large property and its green space is as large as 40,000 square meters (430,556 square feet). As shown in figures 32 and 33, the main green space sits in the center of the grounds, surrounded by various hospital departments. This main green space serves as the lungs for the entire hospital. Thus, patients in any department have visual access to the central green space. The main landscape features in Ruijin hospital include a fountain, a large tract of lawn, and several small gardens.

Frequent resting choices. Small garden in front of Inpatient Dept.

Fig. 32. Ruijing Hospital, Photo by Shuping Yu
Fountain.

Gathering place.

Dove house.

A flock of doves to enjoy.

Central green space surrounded with various departments.

Fig. 33. Ruijing Hospital, Photo by Shuping Yu
Wuhan General Hospital of Guangzhou Military Region (military hospital)

Site Location: Wuhan City, Hubei Province, China

Description:

Wuhan General Hospital of Guangzhou Military Region is located in Wuhan City, Hubei Province, China. This landscape has geomancy elements. The hospital’s location coincides with where streets cross, so a big stone is placed at the entrance to screen off evil spirits. Other elements also reflect Chinese culture. Two Chinese dragons flank the outpatient entrance; this mythical animal is in charge of longevity and pace according to Chinese culture (see figures 34 and 35). The spaces in-between the outpatient and inpatient departments have four gardens: a fitness garden, a resting garden, the Camphor Laurel garden, and an Orange Osmanthus garden. Flowing water will bring propitious spirits (geomancy theory). So, there is an artificial mountain pond with splashing fountain in the Camphor garden.

Stone screen. The mythical animal.

Fig. 34. Wuhan General Hospital of Guangzhou Military Region, Photo by Shuping Yu
Fitness garden. Canopy connecting Inpatient and Outpatient Dept.

Resting Garden. Camphor Laurel Garden.

Fake mountain pond, Inpatient Dept. Orange Osmanthus Garden.

Fig. 35. Wuhan General Hospital of Guangzhou Military Region, Photo by Shuping Yu
People’s Hospital of Hubei Wuhan University (rank top in city-scale)

Site Location: Wuhan City, Hubei Province, China

Description:

People’s Hospital, located in Wuhan City, Hubei Province, China, is the second largest general hospital in Wuhan city and also a typical hospital in urban settings. As shown in figure 36, there is little green space, let alone gardens for people to rest. Most of the space in between buildings is occupied by parking lots.

Entrance to the Outpatient Dept. crowded with cars.

Fig. 36. People’s Hospital of Hubei Wuhan University, Photo by Shuping Yu
Xinhua Hospital of Hubei Province (rank top in city-scale)

Site Location: Wuhan City, Hubei Province, China

Description:

Xinhua Hospital of Hubei Province is located in Wuhan City, Hubei Province, China. Figure 37 shows the most striking feature of this hospital: the viewing garden outside the hall connecting the outpatient and inpatient departments. The garden is a pond surrounded by clusters of shrubs, and there are several beautiful fish swimming in the pond. Patients, visitors and staff passing by the hallway or on upper floors have visual access to this garden area.

Views to viewing garden from hallway. Views to viewing garden from upper floors.

Fig. 37. Xinhua Hospital of Hubei Province, Photo by Shuping Yu
CHAPTER 4 CHINESE TRADITIONAL HEALTH PRESERVING THEORIES

By visiting a number of health care therapeutic gardens and landscapes (Chapter 3), it is apparent that landscapes in hospital settings need special consideration. How therapeutic landscapes may be designed for hospital in China utilizing TCM and other health-preserving philosophies, in particular, needs attention.

In this chapter I elaborate on the opportunities to apply Chinese traditional health preservation theories to the design of landscape in healthcare settings. Various aspects, such as site selection, space arrangement, planting design, water landscapes, road design, and landscape elements are covered.

Some aspects of traditional Chinese theories can be directly applied to the design, such as requirements for surrounding environment from geomancy theories, and categories of healing plants found in Five Phase and Yin Yang theories. For some other aspects, conceptual ideas can be extracted from traditional theories to inform the design process. For example, the idea of *feed body and nourish spirit* from Daoism directs us to activate all five senses and to encourage outdoor activities. This compels symbolically feeding the body through planting and
waterscape design, and leads to include cultural elements for spiritual
nourishment.

It is important to incorporate traditional Chinese health preserving theories
into modern healing environment design, with the purpose of carrying forward
Chinese culture, thereby adding an important complement to medical environment
design. To address these various ideas and to bridge philosophical considerations
(as discussed in Chapter 2) with the design process, I have developed extensive
guidelines. These guidelines are organized into two categories: Landscape Design
Principles and Guidelines, and Components of Traditional Chinese Medicine and
Landscape Design. The first category, Landscape Design Principles and Guidelines, is
a combination of Western and Eastern philosophies and approaches, while the
Components of Traditional Chinese Medicine and landscape Design represents
Eastern philosophies and theories.

*Landscape Design Principles and Guidelines*

**Site Selection (Ke, 2001)**

**Chinese geomancy principles**

**Follow principles of Locating in north, and facing south**

- Balance Yin and Yang energy by introducing lakes and hills,

  adhering to the following rules: south side of hills and north side of
  lake is Yang, and north side of hills and south side of lake is Yin.

**Water and earth in good quality**

- Use plants to purify heavy metals or other notorious components
Good landscape

- Facilitate air circulation by ensuring at least one side of open space

Respect site condition

- During construction ensure primary concern is to capitalize on existing resources

Site Construction Techniques (Ke, 2001)

Planting

- Facilitate cool summer breezes and block cold winter winds
- Use lawn and low vegetation to the southeast, and dense and high vegetation to the northwest

Building orientation

- Block cold winds and facilitate appropriate air circulation
- Manipulate the height and orientation of buildings

Heap mountain and dig lake

- At community scale design achieve effect of hill and lake surround
- Pile earth on the south side and place lake to the north

Space Arrangement (Shu, 2008)

Privacy

Public zone

- Maintain an open space for various activities
- Provide for wide range of people in a hospital, including patients, visitors and work staff
Sub-public zone

- Buffer for quiet space
- Provide seating for resting

Private zone

- Provide special gardens for certain type of patients, or an inner courtyard of a dwelling unit (only available for specific patients or patients from the dwelling unit)

Sub-private zone

- Offer another choice for small groups of patients and work staff to rest or have social conversation

Design techniques

Reduce Noise

- Absorb noise with plants screen off the noise

Space defined by architectural elements

- Offer various spaces defined by different ratios of the distances between buildings/structures to the height in the purpose to create different feelings
- As shown in figure 38, consider the ratio of distance to height
- As shown in figure 39, consider the openness of the space and how it contributes to different feelings
Fig. 38. Experience Related to the Ratio of the Distance to the Height. ; Shu Peng. 


Planting Design

Ecology (Shu, 2008)

- Maintain ecological balance
- Follow rules of biodiversity
- Ensure plants can establish symbiotic relationship

Placement

- Introduce plants for different textures (touch and view)
- Use plants to offer shade, purify air, and screen off the view from outsiders (avoiding a “fish-bowl” affect)
- Locate plants in sun or shade based on plant properties

Water landscape (Chi, 1634)

Use

- Utilize natural form to imitate nature

Scale

- Use large area of water for open and free feelings
- Use small area water for private and enclosed feelings

Form

- Use quiet water to smooth moods
- Use moving water to remind patients the vitality of life

Road design

Hierarchy of road

- Separate traffic circulation and pedestrian circulation for the safety
• Ensure smooth and wide path for patients in wheelchairs
  
  (Cooper-Marcus, 61) (Minimum of 6’ for two wheelchairs to pass)

• Use narrow paving joints (Paving joints should be narrow enough so as not to catch a cane, the wheels of a walker or an IV-pole.
  
  (Cooper-Marcus, 61)

Construction

• Prevent slippery surface with appropriate pavement material

• Follow topography (see fig. 40)
  
  • Pave roads on flat areas
  
  • Avoid placing roads perpendicular to contour lines


Landscape design elements

• Offer various, frequent seating areas

• Provide shade through use of pergolas (also used to define space and to emphasize depth of perspective)
• With sculpture avoid negative association (whimsical or abstract sculptures are often perceived in a negative manner) (Cooper-Marcus, 60)

Components of Traditional Chinese Medicine and Landscape Design

Space for exercise (based in Daoism) (Miura, 62)

Space for static exercise

• Offer space for quiet exercise to nourish spirit, such as meditation and breathing exercises

Space for dynamic exercise

• Offer space for dynamic exercise to feed the body, which includes yin shu, massage, Taiji quan, Five Animal Frolics, chanting, walking, twenty-four festival sitting, and twelve-sectioned exercise

The Connotation of Yin and Yang in Different Theories

The logic of Yin and Yang is based on two basic components: Yin and Yang, which are used to explain a complementary or opposing relationship between objects. It is widely applied in almost every aspect of Chinese philosophies. For example, in traditional Chinese medicine, Yin and Yang is used to understand complicated relationships in the body. Thus, in different theories Yin and Yang are associated with specific meanings. Table 4 demonstrates the characteristics of Yin and Yang as they relate to different theories.
### Table 4: Connotation of Yin and Yang in different theories

<table>
<thead>
<tr>
<th>Suggestions In Landscape</th>
<th>Yin</th>
<th>Yang</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smaller space</td>
<td>Cold color</td>
<td>Bigger space</td>
</tr>
<tr>
<td>Shady area</td>
<td>Sunshine Dappled area</td>
<td></td>
</tr>
<tr>
<td>Personal space</td>
<td>Sunshine Dappled area</td>
<td></td>
</tr>
<tr>
<td>Quiet: reading, thinking</td>
<td>Active: healing exercise</td>
<td></td>
</tr>
<tr>
<td>Soft landscape</td>
<td>Hard landscape</td>
<td></td>
</tr>
<tr>
<td>Cultural landscape</td>
<td>Structural landscape</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Practice Geomancy</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>South</td>
<td></td>
</tr>
<tr>
<td>night</td>
<td>daytime</td>
<td></td>
</tr>
<tr>
<td>winter</td>
<td>summer</td>
<td></td>
</tr>
<tr>
<td>earth</td>
<td>sky</td>
<td></td>
</tr>
<tr>
<td>moon</td>
<td>sun</td>
<td></td>
</tr>
<tr>
<td>motionless</td>
<td>motion</td>
<td></td>
</tr>
<tr>
<td>interior</td>
<td>exterior</td>
<td></td>
</tr>
<tr>
<td>descend</td>
<td>ascend</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chinese Medicine</th>
<th>Anatomy relationship</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>down</td>
<td>up</td>
<td></td>
</tr>
<tr>
<td>belly</td>
<td>back</td>
<td></td>
</tr>
<tr>
<td>Internal organs</td>
<td>Skin and hair</td>
<td></td>
</tr>
<tr>
<td>Feet</td>
<td>head</td>
<td></td>
</tr>
<tr>
<td>Organization structure</td>
<td>Functional activity</td>
<td></td>
</tr>
<tr>
<td>Under-activity</td>
<td>Hyper-activity</td>
<td></td>
</tr>
<tr>
<td>The six hollow organs:</td>
<td>The five internal organs:</td>
<td></td>
</tr>
<tr>
<td>galbladder, stomach,</td>
<td>heart, liver, lungs and</td>
<td></td>
</tr>
<tr>
<td>large intestine, small</td>
<td>kidneys</td>
<td></td>
</tr>
<tr>
<td>intestine, bladder and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sanjiao</td>
<td></td>
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</tr>
</tbody>
</table>

| Traditional Chinese      |                           |                              |
| Chinese Medicine Property| Cold, cool, dark, aggregate, solid, blue, | Hot, warm, light, dissolve, |
|                         | delicate, tangible, dark  | aeration, exciting, strong, |
|                         |                           | bodiless, bright             |

<table>
<thead>
<tr>
<th>Syndrome</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Ying Syndrome:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interior syndrome, cold</td>
<td>Exterior syndrome, hot</td>
<td></td>
</tr>
<tr>
<td>syndrome</td>
<td>syndrome, sthenia syndrome</td>
<td></td>
</tr>
</tbody>
</table>

Chinese Culture and Tradition

Plants

- Educate about medicinal value of plants: properties and use
- Use sounds of plants (created by wind or rain), as frequently depicted in poems (Lou, 155)
- Recognize and utilize association of plants with noble characters (Lou, 155)

Image of cultural connotation

- Include images suggesting longevity, such as flat peach, noodles, crane, Penglai Island
- Include plants suggesting noble characters, such as plum blossom, bamboo, pine, lily, lotus (Lou, 155)
- Ensure restful atmosphere, such as rain drops on the banana tree, pine whispering Pavilion (Lou, 155)

Healing plants (Shu, 37-38)

Plants and body association (Five Phase Theory)

Spleen

- Trees: Magnolia grandiflora, Aesculus hippocastanum, Punica granatum, Sapium sebiferum
- Shrubs: Malus sylvestris, Rosa, Pyracantha, Millettia, Berbers thunbetgii, Forsythia viridissima
- Herbaceous: Acorus gramineus, Euryale ferox, Portulacaceae
Liver

- Trees: Ligustrum, Ailanthus altissima, Styphnolobium, Salix babylonica, Melia azedarach, Cerasus
- Shrubs: Myrica, Nandina domestica, Hedera
- Herbaceous: Paeonia, Cassia cinnamomum, Musa

Heart

- Trees: Ginkgo biloba, Cinnamomum camphora, Diospyros, Acer palmatum, Prunus armeniaca
- Shrubs: Paeonia, Hibiscus, Forsythia, Vitis
- Herbaceous: Ophiopogon, Zingiber officinale,

Lung

- Trees: Carica papaya, Firmiana simplex, Magnolia denudata, Magnolia liliiflora
- Shrubs: Podocarpus macrophyllus, Hibiscus mutabilis, Narrow leaf mahonia, Lycium barbarum, Vitis
- Herbaceous: Houttuynia cordata, Hyacinthus, Lagenaria siceraria, Lilium, Ophiopogon, Phragmites australis, Lophatherum gracile

Kidney

- Trees: Pinus elliottii, Ulmus, Broussonetia papyrifera, Prunus, Carica papaya
- Shrubs: Prunus salicina, Photinia serrulata, Camellia japonica, Prunus persica, Campsis grandiflora, Rosa rubiginosa, Vitis, Parthenocissus
Herbaceous: Dianthus chinensis, Fallopia multiflora, Trachelospermum jasminoides


**Examples of Chinese elements and their application**

In Chapter 3, I elaborated my site observations at several Chinese hospitals. The purpose of my case studies in China was primarily to find examples of how Chinese elements are integrated into a designed medical environment. What follows here are these elements grouped into different categories according to different design intentions (figures 41-44).

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**Fig. 41** Chinese elements following geomancy theory, photo by Shuping Yu
Fig. 42 Chinese elements for regional culture education, photo by Shuping Yu

Fig. 43 healing elements, photo by Shuping Yu
Examples of general healing exercise by local residents

Figure 45 shows morning exercise in a local district park. Observations were done during the month of August, from 6:00 – 9:00 a.m. (the most comfortable time of day). People do various types of like play skate, whipping, shaking arms, fan dancing, and playing horn. A corner of land provides space for morning exercise.
Fig. 45. Morning exercise in a district park, photo by Shuping Yu
Conclusion:

The guidelines presented here were compiled after visiting landscapes at various medical settings (Chapter 2), reviewing traditional Chinese health preserving theories (Chapter 3), and taking into consideration findings in Western literature, in particular offerings by Claire Cooper Marcus. Prioritization of the guidelines will be different with each project, depending on site characteristics, therapeutic objectives, and regional context. This creative project provides one example of applying these guidelines.
CHAPTER 5 INVENTORY AND ANALYSIS

Several factors were considered in the process of completing inventory and analysis for this project. First, investigation of the site’s city location, regional context, and historical background was completed. This helped extract regional and cultural patterns used later in the design process. Next, physical qualities of the site were analyzed, including buildings on the hospital campus (location, microclimates, etc.), and surrounding land use. Analysis of various views and Yin Yang pattern distribution was a part of this piece. Finally, user and medical needs were assessed. Research on user and medical needs included interviews and study of space use. This chapter presents the findings of these studies.

Location and Context

Wuhan Iron & Steel Head Hospital was chosen for this project because it is representative of many urban hospitals in China. In recent years there has been an increased demand for both inpatient and outpatient medical care, resulting in more buildings on the hospital campus, fragmenting the green space further than before. As well, providing both Eastern and Western medical approaches continues.

Wuhan Iron & Steel Head Hospital is located in Qingshan district, Wuhan city,
Hubei province, China. Qingshan is one of the four sub-districts that belong to Wuchang District, which is one of the three major districts that constitute Wuhan (see Fig. 46 for an illustration). Wuhan Iron & Steel Hospital is one of three major general hospitals in Qingshan district and located in an urban setting.

Fig. 46 Site location

To the east and south sides it is generally commercial; to the west and north side, residential. Qingshan District Park is located northeast of the site. The main pollution source, Wuhan Iron & Steel Plant, is located far east of the site (see fig. 47).

Fig. 47. Site context
From scale and level of technology perspectives, Wuhan Iron & Steel Hospital is considered a good size, and has a high ranking. The total area of the hospital grounds is 542,630 square ft. (60,292 square meters) and it ranks as a third-grade class-A hospital (the highest level). It serves mainly the Qingshan district, but is also available to patients from other districts.

**Historical Background**

Wuhan is the capital of Hubei province, in the heart of China. It lies at the intersection of the middle reaches of the giant Yangtze River (the world’s third longest river) and Han River. These rivers divide Wuhan into three main districts: Wuchang, Hankou, and Hanyang. Wuhan is historically well known as the thoroughfare leading to nine provinces because of its central location and close proximity to the rivers (see fig. 46).

Wuhan was first established in the riverside of Yangtze River as a transportation harbor, and has evolved into a transportation hub for air, rail and ferry traffic across China. It is centrally located when considering the distance to other major metropolitan areas in China: Beijing, Shanghai and Guangzhou. Wuhan is famous for its beautiful landscape and historical culture national renowned East Lake and its landmark Yellow Crane tower. This is the origin of Wuhan’s nickname: the hometown of White Clouds and Yellow Crane.

The establishment of Wuhan Iron & Steel Group (Wu Gang) brings economic prosperity and population into Qingshan district, a once quiet and undeveloped small town. Wu Gang has its own kindergarten, primary school, middle school, high
school, restaurants, landscape institute, TV station and hospitals. There are around 100,000 workers in Wu Gang; in other words, eight out of ten Qingshan people work in Wu Gang (Deng, 2012). Thus, Qingshan district is also known as “Iron Town.” Due to the development of Wu Gang, Qingshan has evolved from a small town into a central district of Wuhan City. However, because of the pollution from Wu Gang factories, Qingshan residents suffer from poor environmental conditions as compared to residents in other districts of Wuhan. According to the city’s annual air quality report, Qingshan district ranks the worst of other central districts of Wuhan.

Site Inventory and Analysis

There are many opportunities for landscape improvement on the Wuhan Iron & Steel Hospital grounds. For example, the two plazas in front of both the outpatient and inpatient departments are occupied by large areas of pavement. There are no resting spots or shady space for visitors to stay, and there is little landscape for people to see when they look down from upper floors. Also, there is no strong connection between the inside and outside of the buildings (this is illustrated in fig. 48).
Outdoor Landscape

View from the Top

Indoor Landscape

Roof

Inside and Outside

Fig. 48 Site Photos
Site Analysis

Several factors were considered in the site analysis. Building height and placement, surrounding context, circulation, hardscape areas and green space locations were assessed to determine garden locations.

Building height and location is varied on site. The highest building houses the Inpatient Department, and is located on the southeast portion of the site. Other buildings range from two to five stories. Figure 49 illustrates this, with views of the site from four directions.

![Site Model](image)

Fig. 49 Site Model

Figure 50 illustrates factors in an overlay fashion. The relationship between shadows (on site throughout the year), high noise areas (most present near the south and east streets), heavily traveled vehicular access routes, hardscape areas (predominantly circulation), and available green space was examined in this process. The bottom layer represents the outcome: the ideal location for the gardens. The best location is the space in-between outpatients department and Chinese Medicine Department. The secondary locations are spaces in front of Outpatient and Inpatient Departments.
Fig. 50 Location Analysis

**Microclimate Analysis:**

Considering the factors of building footprints, prevailing winds, sun tracks and existing green space, it was concluded, as a general design solution, to place more evergreen plants in the southern portion of the site and more deciduous plants on the northern part. Figure 51 illustrates this finding in diagrammatic form.
Fig. 51 Microclimate Analysis

View Analysis

When looking out a window the view will be different depending on the viewers’ height. Typically lower heights will result in a view angling more toward the sky, resulting in a reduced view of the ground plane (see fig. 52). In the case of the Wuhan Hospital grounds, views from lower height screens off buildings near the ground, and provides an opportunity to see the District Park and other green spaces at a distance. To support this view, tall trees are proposed close to hospital buildings to screen off the unwanted urban hardscape views, and shorter trees are proposed further away. People in lower floors could look past trunks of big trees and enjoy the designed landscape on the hospital grounds (see fig. 53).
According to Chinese geomancy theory, a good space should be well balanced with Yin and Yang. Table 5 diagrammatically illustrates Yin and Yang in the world of landscape. The property of Yang is associated with big space, warm color and active activities. In contrast, property of Yin is associated with small space, quietness, cold and hardness. Thus, it is proposed there will be more Yang space close to the entrances (in front of Outpatient and Inpatient Departments), while more Yin space located in between outpatient department and Chinese medicine department (see fig. 54).
Table 5 Yin and Yang Comparison in Landscape

<table>
<thead>
<tr>
<th>Yin and Yang Comparison</th>
<th>Yin</th>
<th>Yang</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggestions In Landscape</td>
<td>Smaller space</td>
<td>Bigger space</td>
</tr>
<tr>
<td>Cold color</td>
<td>Warm color</td>
<td></td>
</tr>
<tr>
<td>Shady area</td>
<td>Sunshine Dappled area</td>
<td></td>
</tr>
<tr>
<td>Personal space</td>
<td>Public space</td>
<td></td>
</tr>
<tr>
<td>Quiet: reading, thinking</td>
<td>Active: healing exercise</td>
<td></td>
</tr>
<tr>
<td>Soft landscape</td>
<td>Hard landscape</td>
<td></td>
</tr>
<tr>
<td>Cultural landscape</td>
<td>Structural landscape</td>
<td></td>
</tr>
</tbody>
</table>


Fig. 54 Yin and Yang distribution

Site and User Assessment

To better understand the outdoor space at Wuhan Iron & Steel Hospital, a typology of space assessment was completed using Cooper Marcus’ guidelines (see table 6).
Table 6 Space Evaluation

<table>
<thead>
<tr>
<th>Typology of Spaces (Marcus, 1999)</th>
<th>Outdoor Landscape</th>
<th>Indoor Landscape</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Landscape Grounds</td>
<td>Landscape Setback</td>
</tr>
<tr>
<td>Well Balance of Privacy And The Public Use</td>
<td>☆</td>
<td>☆</td>
</tr>
<tr>
<td>Appropriate Hierarchy of Movement</td>
<td>☆</td>
<td>☆</td>
</tr>
<tr>
<td>Maintenance</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>Healing Function</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well Integrated with All Natural Elements</td>
<td>☆</td>
<td>☆</td>
</tr>
<tr>
<td>Encourage Communication</td>
<td>☆</td>
<td>☆</td>
</tr>
<tr>
<td>Good Borrow of Landscape</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Space Efficiency Usage</td>
<td>☆</td>
<td>☆</td>
</tr>
<tr>
<td>Activate Five Senses (sounds, smells, textures, sights, tastes)</td>
<td>☆</td>
<td>☆</td>
</tr>
<tr>
<td>Coherence of The Environment</td>
<td>☆</td>
<td>☆</td>
</tr>
<tr>
<td>Appropriate Scale</td>
<td>☆</td>
<td>★</td>
</tr>
<tr>
<td>Clear Direction</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>Universal Access</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td>Seasonal Interests</td>
<td>☆</td>
<td>☆</td>
</tr>
<tr>
<td>Historical Identity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Universal Design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accommodate a Wide Range of Ages</td>
<td>☆</td>
<td>☆</td>
</tr>
</tbody>
</table>

Notes: Full accomplishment = ★, Half-accomplishment = ☆, No accomplishment = blank

In general, it was found that there was little landscape designed for people to rest and stay. Maintenance is well considered throughout the landscape. However, in terms of healing function, little is achieved.
Research on Users

Results from interviews among patients and work staff from the site

In total, 36 people were interviewed. This process took place over several days, including work days and weekends, from midday to evening. Interviewees were selected at random. A questionnaire was used to guide the discussions, though the conversations were not restricted to these topics. If the interviewee was interested in other topics the discussion went in that direction. The following summarizes findings from this process.

Opinions about the hospital:

Patients:

The patients felt the outdoor spaces lacked the following: outdoor spaces for rest or exercise, good views of natural environment, and comfortable places for social activities (e.g., social conversation).

Work staff:

Work staff felt the outdoor spaces could be used temporarily by work staff, and that there were no outdoor healing environments for patients.

Time spent in outdoor space of the hospital:

In most cases people spent less than 5 minutes outside during their visit or stay, except those with children (who liked to run around outside).

Features would like to contact with (from patients and work staff):

Users of the space mentioned they would like to have the following on site: trees, flowers, grass, benches, pebbles, sunshine, water features (like a pond or
fountain, stream), picturesque photos, sculptures, birds, features with cultural and historical meaning, and changing scenes.

**Preferred atmosphere (from patients and work staff):**

Users of the space preferred an atmosphere with the following characteristics: shade, restful, semi-private, quiet, friendly, and familiar.

**Preferred activities:**

Users noted they most like to sit, walk, talk, and exercise.

**Conclusion:**

The analysis of the site’s context, physical properties and users helped me better understand the characteristics of the site as well as potential directions to take the design. Given the large amount of underutilized space, and the varied opportunities on site, it is evident there is a need for improvement on the hospital grounds. As well, the range of medical services delivered and the different types and kinds of space highlight the number of outdoor programming needs.
CHAPTER 6 DESIGN DEVELOPMENT

Goal and Objective Development

Several factors were considered in the development of the goals and objectives presented in this chapter. First, consideration was given to the guiding principles established based on the integration of Chinese landscape design and Chinese health preserving ideas, which includes Daoism philosophy, geomancy theory and traditional Chinese medicine (presented in Chapter 2). Second, the site selected and user groups of the Wugang Iron & Steel Hospital were considered in this process. Third, regional cultures were integrated into the design principles, which included the geomancy context of Wuhan city, the development origin of Qingshan district, and also the historical background of the hospital.

The following goals and objectives demonstrate the application of therapeutic landscape design in an urban hospital setting, reflect Chinese culture, and frame the integration of the practice and theory of Chinese traditional health preserving ideas in the land form and use.
Goal and objectives

Optimize Garden Access and Use

- Maximize number of users

  Provide convenient and safe access

  1. Locate gardens near building entrances
  2. Design for human comfort zone (shade in summer, sun in winter)

Accommodate various user groups

  1. Provide for children, adults, and elders
  2. Provide for temporary use by hospital staff
  3. Resting space for visitors

Accommodate a wide range of health conditions

  1. Create a healing environment to reduce stress and promote recovery
  2. Meet universal access principles
  3. Provide sufficient seating areas for resting
  4. Offer features activating five senses (sound, smells, textures, sights, tastes)

- Maximize garden use

  Provide seasonal interest

  1. Include a greenhouse for use in cold weather
2. Utilize a balance of evergreen, deciduous, flowering, and multiply colored plants

3. Shelter from wind, sun or rain

Accommodate visitor engagement
1. Include movable benches
2. Provide access to indoor, outdoor, and transitional spaces

Balance and Integrate with Surrounding Environment

- Minimize intrusions from surrounding environment
  
  Screen off noise from streets
  1. Use plants to absorb the noise
  2. Use flowing water to conceal the noise

Improve air quality
1. Use plants with good performance in air clarification
2. Use plants which can emit pleasant odors

Block out bad view of surrounding landscape
1. Use plants to block or obscure the bad view
2. Use landscape structures to block the bad view

- Take advantage of good elements from surrounding environment
  
  Open views to good landscape from surrounding environment
  1. Design windows or open view to gardens or green space from hospital surroundings
  2. Use plants or landscape structures to frame the view
towards good landscape features, like a tower far away

- Connect clearly to surrounding context

Provide safe circulation

1. Establish 2-tier (primary, secondary) pedestrian circulation

2. Establish clear circulation and drop-off system for vehicles

3. Align on-site pedestrian and vehicular systems with off-site systems

Provide clear way finding

1. Provide appropriate lighting for comfort and safe walking

2. Provide unambiguous hierarchy of entrance for patients easily find their destination

3. Use distinctive signage for each garden or other destination

4. Offer a destination point for every sect of route

5. Provide looped path to aid orientation

- Create strong viewshed connections

View from inside

1. Provide at least a viewing garden outside windows

2. Open windows at where green space is available
3. Provide transitional green space like corridors, which are not just for resting, also serve for good view for people from inside

4. Add planting pot or green art pieces in indoor space, when there is no available view to green space outside

5. Use tall trees to obscure views to busy streets outside the hospital, and open views to the garden designed inside the hospital

View from outside

1. Offer panoramic view for reflection, where location and topography permit

2. Screen views directly towards patients room, expect there is a transitional resting space

3. Use green walls and roof garden to reduce the dominant hardscape of buildings

Provide Therapeutic Opportunities

- Offer sense of control and access

  1. Provide opportunities to observe others

  2. Ensure gardens are visible and accessible

  3. Avoid “fishbowl” effect, providing sense of privacy

  4. A place for staff to claim for a temporary away from patients.
• Provide choice
  1. Allow for varied degrees of shade for patients in different health conditions.
  2. Include seating in sun or shade
  3. Ensure multiple choices to choose where to sit or eat, or whether to stay alone or in group.
  4. Ensure that people of all ages and abilities are able to enter and move around in the garden

• Offer social support and encourage social activities
  1. Provide comfortable and pleasant spaces
  2. Ensure enough space for public activities
  3. Include appropriate seating to encourage interaction, like multiple chairs for social conversation

• Provide for physical engagement

Provide exercise spaces
  1. Include appropriate space for static and dynamic exercise
  2. Include varied lengths of trail for 2-10 minutes’ walk.

  1. Provide varied experiences
  2. Use deciduous plants to remind people the passage of time
  3. Use plants with varied color and textures to awaken all the senses
4. Design intricate planting beds for detailed appreciation
   (frail patient may move slowly, and sit for long time in one place)

Allow for access to other natural elements
1. Include raised beds for gardening activities
2. Use still, reflective or moving water to engage, soothe, and attract wildlife

Integrate Chinese Health Preserving Ideas

• Apply Philosophy of Daoism

Space for healing exercise
1. Static exercise:
   Quiet exercise nourish spirit
   Meditation and Breathing exercises
2. Dynamic exercise:
   Dynamic exercise feeds the body
   Yin shu, massage, Taiji quan, Five Animal Frolics, twenty-four festival sitting, and twelve-sectioned exercise

• Apply Chinese geomancy theory

Site selection
1. Locate important structure in north of the site, and face south side of the site
2. Balance of Yin and Yang (refer to Table 4)

3. Good landscape surrounding the structure

   Ensure at least one side of open space to
   orient the view to landscape far away
   Use planting to facilitate cool summer
   breezes and block cold winter winds
   Use lawn and low vegetation to the
   southeast, and dense and high vegetation to the
   northwest

• Apply Philosophy of Traditional Chinese Medicine

   Achieve educational purpose through garden visit

   1. Medicinal herbs education

      Offer various types of planting beds with plants
      explanation board

   2. Yin and Yang Theory education

      Offer Yin and Yang theory explanation boards
      where Yin and Yang theory is applied in the designed
      space of the garden

   3. Five Phase Theory education

      Planting design follows the plant lists
      assorted by Five Phase Theory

   4. Jing-luo System education
Utilize abstract artwork, such as linear pavements in garden with explanation board to suggest complicated Jing-luo system

5. Food Regimen education

Offer space for food planting and education activities

Achieve healing function

1. Apply healing plants according to its category from Five Phases Theory

2. Balance Yin and Yang space

**Integrate Chinese Culture into landscape in hospital**

- Regional culture and identity

Utilize familiar icons that feel comfortable for patients and staff, such as:

1. Yellow Crane tower

2. East lake

3. Gui yuan Temple

Look to regional context for appropriate style, form, color and materials:

1. Red bricks or grey bricks are commonly used in Wuhan residential design

2. Wuhan is famous for its location at the conjuncture of
three rivers and of nine provinces.

3. Wugang Iron & Steel Corporation is not only the historical background of the hospital, but also the main developmental origin of Qingshan district.

- Apply Chinese traditional materials or material with regional cultural implication into garden design, such as:

  Materials associated with regional culture

  1. Steel refers to Iron & Steel corporation and the original development of Qingshan District

  2. Water refers to geographical features of Wuhan, located at the juncture of three rivers

Traditional materials

  1. Plants associated with noble characters:

     Four gentlemen (plum blossom, orchid, bamboo, chrysanthemum) (Lou, 155)

     Lily and lotus associated with purity (Lou, 155)

     Three friends in winter (pine, bamboo and plum)

  2. Chinese, pottery, wood, wind-bell(bring propitious spirits according to Chinese geomancy) (Chen, 2012)

Images of cultural connotation:

  1. Longevity: Flat peach, noodles, crane, Penglai Island

  2. Restful atmosphere: rain drops on the banana tree, pine
whispering Pavilion (Lou, 155)

- Integrate Chinese classical garden design theories, techniques, and elements

Central ideas

1. Achieve endless artistic conception within limited space

2. Emphasize the spiritual communication with the landscape

Design techniques

1. Dividing:

   Divide the whole garden into several scenic units, and make each one partially disclosed to one another, in order to negate a feeling of narrowness

2. Sequence:

   Arrange a series of scenic point gradually revealed along a meandering path, inviting visitors to explore along designed route

3. Borrowing:

   Frame a focal point to any attractive landscape outside the site

4. Contrasting:

   Use contrasting to enrich experience in a limited space

   Big space contrasted with small space
Open space contrasted with enclosed space

Soft texture contrasted with hard surface

Sunny space contrasted with shady space

High structure contrasted with low point

5. Seasons

Achieve Seasonal interests through careful planting design:

Spring: green sprouts in spring,

Summer: summer flowers

Autumn: rain drops on leaves, colored leaf tress,

Winter: wind whispers through branches

Shadows of shaking branches on the white wall

Offer various roofed structures for all-weather landscape, making it appreciable, strollable and habitable, such as pavilions, corridors, pagodas

Design elements (Chinese Garden Design Techniques):

1. Water

Used to balance the hard surface of sculptural mountain

Serve as a peaceful and natural element

2. Rock
Remind people of the beauty of mountains

Symbolize the dwelling of Taoist immortals as an ageless object

3. Plants:

Associated with overcoming the limitation of ordinary life, especially plants survive in harsh weather

Remind observers of the elapse of time

4. Buildings:

Arranged to accent the garden with their windows and doorways

Frame scenic views to courtyards and beyond.

Design

Site Master plan and Garden Concept

Hospitals are very sensitive settings, and the designed environment should fully serve needs of users. Wuhan Iron & Steel Hospital is a comprehensive hospital, designed to give a wide variety of treatment services. Thus, its users are varied with different levels and types of illness. The main goals of this creative project are to offer a resting, relaxing space for work staff and visitors, and opportunities for patients to rest or take outdoor healing exercise. This was achieved, in part, by helping users better understand traditional Chinese medicine when they rest in featured gardens.
Ten types of gardens across the Wuhan Iron & Steel Hospital are proposed, allowing for a wide range of opportunities for patients, visitors, and staff. As illustrated in the following list, each garden has its own characteristic and targets at different groups of people.

**Proposed Gardens**

**Meditation Garden**: quiet; negative energy, spiritual healing experience, Chinese medicine education, including color zone, smell zone, sound zone, touch zone, taste zone, meditative zone

**Children Garden**: active; positive energy; for children comfortable with physical movement

**Resting Garden**: comparatively quiet, positive energy; for visitors to stay and relax, social activity

**Serene Garden**: quiet, negative energy; for patients with immediate needs to contact with nature

**Horticultural Garden**: comparatively quiet, positive energy, for patients doing planting and learning about Chinese Herbs, an expansion point of Chinese Medicine education

**Fitness Garden**: comparatively quiet, positive energy, for patients do morning or late afternoon exercise (Chinese healing exercise), another expansion point of Chinese Medicine education

**Roof Garden on out-patient department**: a place for work staff to claim and get temporarily away from patients; for eating and relaxing
Roof Garden on in-patient department: for patients and work staff from Inpatient Department; for eating, relaxing

Roof Garden on traditional Chinese department: for patients and work staff from Inpatient and Outpatient Departments; for viewing and relaxing

Greenhouse in horticultural garden: for therapeutic activities and Chinese herbs learning

The following illustration (fig. 55) shows the location of the proposed gardens in relationship to the hospital buildings.

Fig. 55 Garden Location
Twelve gardens are proposed for the Wuhan Iron & Steel Hospital site. Eight of these gardens are located at landscape level, with four being roof gardens. The landscape level gardens offer safe walking systems for people to any destination in the hospital (see fig. 56).

The different gardens are designed to serve to the needs of hospital users. The Children’s Garden, located on the west side of the Outpatient entrance, is for patients and visitors of the Children’s Department. The Serene Garden, located on the east side of the Outpatient entrance, is aimed at serving any visitor or work staff that needs immediate access to quiet space. The Resting Garden, which connects the hospital’s main entrance with the Outpatient entrance, is designed to offer a range of spaces (big or small) for people to relax. The Fitness Garden, located in front of the Inpatient entrance, is designed for people to do healing exercise. The Horticultural Garden, located on the southwest side of the Inpatient Department, is for planting activities. Pocket Garden 1 is a green space connecting the horticultural garden and the dining hall, while Pocket Garden 2, serves as a viewing garden for patients from Hyper-oxygen Department. The Meditation Garden, located in-between TCM Department entrance and behind the Outpatient Department, is designed to serve inpatients from TCM Department. While it is available to people from the Inpatient Department, it can be viewed from the upper floors of both the Inpatient and Outpatient Departments. The Roof-Garden of the Outpatient Department is designed for the work staff of the hospital as a place to relax. The Roof-Garden of the Inpatient Department is designed for inpatients to
relax, especially those from the upper floors. The Roof Gardens of the dining hall and TCM are designed as viewing gardens for hospital users on upper-floors.
Detailed Gardens

Among all the proposed gardens, meditation garden is most extensively designed. Because it is located close to the TCM Department, and its potential users are mainly from the TCM Department, it is aimed at providing a therapeutic experience for its users. It exemplifies how Chinese elements (especially TCM) can be integrated into garden design. Further, it demonstrates how to bring the educational aspect regarding Chinese health-preserving theories into the garden.

Meditation Garden

Fig. 57 Enlarged master plan of meditation garden

Meditation Garden Description

Based on inventory and analysis, the potential users of meditation garden are composed of patients and visitors from the Traditional Chinese department (located on the north side of the garden), visitors and patients heading to dining hall (located on the east side of the garden), and patients and visitors coming from Outpatient department (located on the south side of the garden). Patients can also
view the garden from the Outpatient Department (located on northern part of the first-floor).

This garden area is located close to the Traditional Chinese Medicine Department. Because of this location, away from busier parts of the site, it is quieter compared with other gardens at Wuhan Iron & Steel Hospital. The character of meditation garden is more Yin, and it is meant to educate users about traditional Chinese medicine. In support of this educational objective the layout of the garden bears the markings of the Five Phase Theory providing the user with an experience framed by six key gardens (see Fig. 58). The meditation garden is for inpatients from traditional Chinese Department, it is also available for visitors and inpatients from other departments.

This garden was designed to optimize access and use. Entry points were considered, and the main three entrances of meditation garden are positioned in line with pedestrian circulation. Along the universally accessible pathways, almost every 10 meters, there are chairs installed for people to rest. And shelters by the pergola in the smell and taste zones make visits to the garden in bad weather possible.

The meditation garden was also designed to accommodate a wide range of health conditions and to meet therapeutic goals. Lavishly planted vegetation creates a comfortable space for stress relief. Visitors to the space enjoy a strong sense of control as there are various social support and activities to choose from (such as planting or tea tasting opportunities), and ample opportunities exist for
walking and massage exercise.

Fig. 58 The application of Five Phases Theory in meditation garden

The division of this garden into six zones (based on the Five Phase Theory) aids
the delivery of an environment for various health conditions. Guests have close contact with natural elements; they can touch with plants (touch zone) enjoy various scents (while sitting under the pergola in the smell zone), or listen to or socialize with others (sound zone). Multiple benches are available for resting in the sound and color zones, and a meditation zone is also present for those wishing to spend time alone in the garden.

The meditation garden is designed to be balanced and integrated with the surrounding environment. A two-tier walking system was utilized for safe circulation and clear way finding. Rows of trees and shrubs planted at the edges of the garden are intended to screen off noise from streets and clarify the air, and a combination of evergreen, deciduous, and multiple flowering plants offer seasonal interests. In the sound zone there are meandering linear planting beds with sitting benches at the southeast edge of meditation garden; these are intended to attract visitors to the garden. Also, the color and taste zones located in the south side of meditation garden are intended to create a viewing garden for patients in the contagious department, located in the north side of the first floor of outpatient department. As well, the meditation garden is considered a viewing garden for people standing in up-floors of surrounding buildings.

Chinese traditional health preserving ideas were also integrated into the design of meditation garden. According to Daoism philosophy, static exercise can nourish spirit and dynamic exercise can feed the body. In the meditation zone, people can meditate or engage in breathing exercises, and can spiritually connect with nature.
by listening to rain dropping on banana leaves under the pergola.

In terms of the application of geomancy theory, the most important aspect is a balance of Yin and Yang. In this regard the meditation garden has Yin (shady, small and quiet spaces) and Yang (sunny, open and no, sunshine, open and louder spaces). This is not to say that the space was merely divided into two sections (one with Yin properties and the other with Yang). Instead, Yin and Yang spaces can be found throughout the garden.

Principles and goals from Traditional Chinese Medicine were used in different ways in the design of this garden. The arrangement of meditation garden follows the order and direction of the Five Phase Theory, with each zone corresponding to specific body organs; as well, plants chosen are from the recommend lists associated with from this theory.

Many of the design decisions, placement of elements, and inclusion of detailed signage were directed at educating visitors about theories of Traditional Chinese Medicine. A few examples of this include:

- Five different colors of vegetables plants are in the color zone to support the understanding of the Five Phase Theory.

- Plants used in the making of tea are in the taste zone, providing opportunities for learning about herbal medicine and teas.

- Water is found in the garden, literally or symbolically, through meandering streams, blue paving, ponds, and fog nozzles. The water represents channels in the human body (see Fig. 59).
• Clear signage and placards provides information on geomancy (Yin Yang)

Traditional Chinese culture and classic design techniques were also integrated into the design of meditation garden. Regional materials such as red bricks were used in the planting beds, wind-bells hang on trees in sound zone and plants associated with noble characters, such as plum blossom, orchid, bamboo, chrysanthemum are found in the garden.

Fig. 59 Abstract water system in meditation garden

On the following pages are multiple perspectives that provide a visual understanding of the medication garden. This begins with an aerial perspective (Fig. 60), which is followed by a map indicating the view angles of the following perspectives (Figures 61 – 67).
Fig. 60 Aerial view of meditation garden

Fig. 61 Perspective angles of meditation garden
Fig. 62 Perspective 1 of meditation zone

Fig. 63 Perspective 2 of water zone (Yang part, open side water feature)
Fig. 64 Perspective 3 of water zone (Yin part, enclosed side of water feature)

Fig. 65 Perspective 4 of gold zone (taste zone, education about dietary regimen)
Fig. 66 Perspective 5 of earth zone (touch zone)

Fig. 67 Perspective 6 of wood zone (sound zone)
Resting Garden

Resting Garden Description

The resting garden is located in-between the main hospital entrance and the outpatient department. Its potential users are mainly composed of visitors and outpatients, who usually stay less than half an hour outside. Thus, the main function of resting garden is offering visitors a nice walking experience on their way to the outpatient department and a comfortable space to rest while waiting.

The entrance plaza connecting main entrance and outpatient department separates the resting garden into two parts. The layout of the resting garden was developed with Chinese classical garden design techniques: a series of spaces of different sizes and views were created through dividing, sequence, borrowing and contrasting. Some spaces are small and enclosed for being alone, while some spaces are semi-enclosed, and others are more open for social conversation. This garden offers both shady and sunny places, and the layout meets universal access requirements. All of the design decisions were made serve the central goal: accommodating various needs of people.

The surrounding context also influenced design decisions. Densely planted trees and shrubs at the edge of resting garden help to obscure noise and unpleasant views of vehicular traffic, and the planting beds flanking the entrance plaza serve as a pleasant transitional space between walking area and resting area (as also as an exhibition space to educate people about herbal medicine).
The master plan provides an overview of the garden and its elements (see figure 68). On the following pages are perspectives that provide a visual understanding of the resting garden. This begins with an aerial perspective (Fig. 69), which is followed by a map indicating the view angles of the following perspectives (Figures 70 – 74).

Fig. 68 Enlarged master plan of Resting Garden

Fig. 69 Aerial view of resting garden
Fig. 70 Perspective angles of Resting Garden

Fig. 71 Perspective 1 of resting garden (Yang, open)
Fig. 72 Perspective 2 of resting garden

Fig. 73 Perspective 3 of resting garden (Yang, open)
Fitness Garden Description

The fitness garden is located in front of the inpatient department. Safety and circulation were major considerations in this design as parking, vehicular traffic, and pedestrian access to the main entrance needed to be addressed. Major pathways were included to provide connections between parking and the entrance; the pathways act both as transitional spaces and boundaries for various garden sections. The southern section of this garden features a sequence of small spaces defined by rows of bamboo where patients can exercise individually (breathing exercises (Taiji Quan), for example. The other two sections, on north side, present multiple spaces of various sized, are organized in a naturalistic fashion with groupings of shrubs and trees. Here, people there can choose their own corner or space for small groups to do dynamic exercise.
On both sides of entrance plaza there are multiple benches for people to rest. These benches are carefully placed, backed by groups of shrubs so people doing exercise have a degree of privacy. On the northwest side of fitness garden, there are two planting beds situated in between benches and the walkway. People sitting there can choose to observe others or to be observed; this option provides them a sense of control.

As with other gardens the layout of paths and walkways in the fitness garden meet universal access requirements. Thus, the garden is accessible to visitors in any health condition. Furthermore, this lushly planted garden offers a nice view for patients on the upper floors of the inpatient department.

The master plan provides an overview of the garden and its elements (see figure 75). Two perspectives provide a visual understanding of the fitness garden. This begins with a map indicating the view angles of the following perspectives (fig.76) and is followed by two views (figures 77-78).
Fig. 75 Enlarged master plan of fitness garden

Fig. 76 Perspective angles of fitness garden
Fig. 77 Perspective 1 of fitness garden (for healing exercise, dynamic exercise)

Fig. 78 Perspective 2 of fitness garden (opportunities for observing and being observed)
Serene Garden

Serene Garden Description

The serene garden is a triangle-shaped small garden adjacent to the outpatient department. Because it is edged by vehicular traffic, the garden has been set below garden, and is densely planted with trees and shrubs at the edges. Lowering the space in this manner, and carefully using vegetation helps to obscure traffic views.

The serene garden’s proximate location to the outpatient department helps to serve people needing a close resting spot, or to be alone. The slow flowing water in a rectangle shaped pond creates a quiet atmosphere to help soothe the mind, and to release stress. All of these characteristics contribute to a restful, inwardly-focused garden.

The master plan provides an overview of the garden and its elements (see figure 79). The following perspective (fig. 80) provides a view of the serene garden.

Fig. 79 Enlarged master plan of serene garden
Design Assessment

Evaluating design decisions is critical to better understand successes and failures and to advance our theories, methods, and techniques. With this in mind protocols were developed for two uses: to identify potential space use and to evaluate the design results.

Potential space use

Wuhan Iron & Steel hospital is a comprehensive hospital, with many different patient types and needs, visitors, and staff requirements. For this reason a range of potential needs based on user types were (see tables 7–10). User needs are categorized by hospital departments, and included in these charts are potential solutions. These charts helped clarify design directions and decisions for this project.
Table 7 Types of Users from Outpatient Department

20-30 people, on average 10-20 minutes/person stay outside; 10 people, on average 30 minutes/person stay outside

<table>
<thead>
<tr>
<th>Types of users</th>
<th>Needs</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children 1: Visiting children (healthy)</td>
<td>Burn energy</td>
<td>CG: Large space to run and play</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Design for mystery and discovery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Colorful elements</td>
</tr>
<tr>
<td>Children 2: Limited mobility</td>
<td>Interesting elements for positive distraction</td>
<td>CG: Water ponds for play</td>
</tr>
<tr>
<td>Children 3: Unhappy children</td>
<td>Personal space for calming</td>
<td>RG: Tiny, cute, interactive sculpture</td>
</tr>
<tr>
<td></td>
<td>Interesting elements for positive distraction</td>
<td></td>
</tr>
<tr>
<td>Adult 1: Visiting adult</td>
<td>Nice view for relaxation</td>
<td>MG: Water, trees, flower, benches, landforms for nice views</td>
</tr>
<tr>
<td></td>
<td>Social activity opportunities</td>
<td>RG: Benches, trees, landform, water, pavilion, shade, trees</td>
</tr>
<tr>
<td></td>
<td>Personal space for calming</td>
<td>RG/SG: Plantings for nice views</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SG: Benches, ornamental trees and pond</td>
</tr>
<tr>
<td>Adult 2: 3-6 Floor patients</td>
<td>Nice view for relaxation</td>
<td>MG: Water, trees, flower, benches, landforms for nice views</td>
</tr>
<tr>
<td></td>
<td>Social activity opportunities</td>
<td>RG: Benches, trees, landform, water, pavilion, shade, trees</td>
</tr>
<tr>
<td></td>
<td>Personal space for calming</td>
<td>RG/SG: Plantings for nice views</td>
</tr>
<tr>
<td></td>
<td>Comfortable place for waiting</td>
<td>SG: Benches, ornamental trees and pond</td>
</tr>
<tr>
<td>Adult 3: Infectious patients</td>
<td>Nice view of nature</td>
<td>MG: Water, trees, flower, benches, landforms for nice views</td>
</tr>
<tr>
<td></td>
<td>Opportunity to observe others</td>
<td>IPs: Trellis, planting pots, accessible planting beds</td>
</tr>
<tr>
<td>Staff</td>
<td>Temporary work breaks</td>
<td>RG-O: Flowers, benches, shrubs, individual chairs and benches for large or small groups of social conversations</td>
</tr>
<tr>
<td></td>
<td>Personal space to relax</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social activity (for 2-3 or 4-6 people)</td>
<td></td>
</tr>
</tbody>
</table>

Notes: **IPs**: Indoor Plants **CG**: Children Garden **RG**: Resting Garden **SG**: Serene

Garden **MG**: Meditation Garden **FG**: Fitness Garden **PG**: Pocket Garden **RG-O**: Roof

Garden-Outpatient Dept. **RG-D**: Roof Garden-Dining Hall **RG-I**: Roof

Garden-Inpatient Dept.
### Table 8 Types of Users from Hyper-Oxygen Department

<table>
<thead>
<tr>
<th>Types of Users</th>
<th>Needs</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>Nice familiar views</td>
<td>PG2: Subtle colors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Common/native plants</td>
</tr>
<tr>
<td>Staff</td>
<td>Nice views</td>
<td>PG-2: Colorful plantings for views of nature</td>
</tr>
<tr>
<td></td>
<td>Temporary work breaks</td>
<td>RG-O: Flowers, benches, shrubs, individual chairs and benches for large or small group social conversation</td>
</tr>
<tr>
<td></td>
<td>Personal space to relax</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social activity (for 2-3 or 4-6 people)</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- **PG2:** Pocket Garden 2
- **RG-O:** Roof Garden-Outpatient Dept.

### Table 9 Types of Users from Inpatient Department

<table>
<thead>
<tr>
<th>Types of Users</th>
<th>Needs</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visitor 1:</td>
<td>Short time stay</td>
<td>Walk through FG, RG before leaving</td>
</tr>
<tr>
<td>Friends</td>
<td>Mild stress relief</td>
<td>Views to FG/MG, RG-D, RG-T</td>
</tr>
<tr>
<td>Visitor 2:</td>
<td>Close relationships, more stressed</td>
<td>Views to FG/MG, RG-D, RG-T</td>
</tr>
<tr>
<td>Relatives</td>
<td>Longer stays (2-3 times/day)</td>
<td>Walk through FG, RG, HG, PG-I</td>
</tr>
<tr>
<td>Visitor 3:</td>
<td>Close relationships, depressive</td>
<td>Walk through GF, RG, HG, PG1, MG</td>
</tr>
<tr>
<td>Relatives</td>
<td>Long stays (all day)</td>
<td>Spiritual healing in MG</td>
</tr>
<tr>
<td>Private nursing</td>
<td>Friendship, depressive</td>
<td>Post stories about brave patients fighting disease</td>
</tr>
<tr>
<td>Patient 1:</td>
<td>Reduced sensory perception</td>
<td>IPs for viewing</td>
</tr>
<tr>
<td>Old age</td>
<td>Danger of wandering</td>
<td>HG close to building for immediate need</td>
</tr>
<tr>
<td>Seriously ill</td>
<td>Balance challenges</td>
<td>Unimpeded access</td>
</tr>
<tr>
<td>Patient 2:</td>
<td>Light exercise</td>
<td>Handrail, raised planter</td>
</tr>
<tr>
<td>Elderly</td>
<td>Potential dizziness from sudden change in posture</td>
<td>View to FG/MG, RG, RG-D, RG-T</td>
</tr>
<tr>
<td>Not seriously ill</td>
<td>Increased risk of bone fracture Tires easily</td>
<td></td>
</tr>
<tr>
<td>Patient 3:</td>
<td>Psychological: strong desire to be cured, more energetic</td>
<td>Choice of route length in RG, FG</td>
</tr>
<tr>
<td>Middle age</td>
<td>Physical: gradually regain physical ability</td>
<td>Handrail in RG, FG</td>
</tr>
<tr>
<td>Seriously ill</td>
<td>Limited movement</td>
<td>Raised planter for easy gardening</td>
</tr>
<tr>
<td>Patient 4:</td>
<td>Relax</td>
<td>HG, raised planter for easy gardening</td>
</tr>
<tr>
<td>Middle age</td>
<td>Needs various exercise</td>
<td>Close garden easy access</td>
</tr>
<tr>
<td>Not seriously ill</td>
<td></td>
<td>View to FG, RG, HG, PG-1, MG</td>
</tr>
<tr>
<td>Patient 4:</td>
<td>Relax</td>
<td>FG different spaces for exercise</td>
</tr>
<tr>
<td>Middle age</td>
<td></td>
<td>MG a little far, but available</td>
</tr>
<tr>
<td>Not seriously ill</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 10 Types of Users from Chinese Medicine Department.

<table>
<thead>
<tr>
<th>Types of Users</th>
<th>Needs</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visitor 1:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td>Relaxation</td>
<td>RG, MG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>View to MG, RG-D</td>
</tr>
<tr>
<td>Visitor 2 and 3: relatives (2-3 times/day)</td>
<td>Relaxation</td>
<td>View to MG, RG-D</td>
</tr>
<tr>
<td></td>
<td>Space for calming</td>
<td>RG, SG, MG, HG</td>
</tr>
<tr>
<td>Patients 2 and 3</td>
<td>Nice view inside &amp; outside</td>
<td>View to MG, RG-D</td>
</tr>
<tr>
<td></td>
<td>Able to walk outside for relax</td>
<td>View to IPs</td>
</tr>
<tr>
<td></td>
<td>Use TCM tools to manage life</td>
<td>Balance energy in MG</td>
</tr>
<tr>
<td>Staff</td>
<td>Temporary away from patients</td>
<td>View to MG, RG-D</td>
</tr>
<tr>
<td></td>
<td>Personal space to relax</td>
<td>View to IPs</td>
</tr>
<tr>
<td></td>
<td>Social activity (2-3 or 4-6 people)</td>
<td>RG-O</td>
</tr>
</tbody>
</table>

Notes: **IPs**: Indoor Plants **CG**: Children Garden **RG**: Resting Garden **SG**: Serene Garden **MG**: Meditation Garden **FG**: Fitness Garden **PG**: Pocket Garden **HG**: Horticultural Garden **RG-O**: Roof Garden-Outpatient Dept. **RG-D**: Roof Garden-Dining Hall **RG-I**: Roof Garden-Inpatient Dept.

In addition to individual patient, visitor, and staff needs, reviewing relationship between therapeutic needs and garden spaces is valuable. Table 11 provides a comprehensive overview of these relationships, providing a snapshot of the range of gardens in which particular needs are addressed. This chart will provide the first step in understanding the connection between therapeutic goals and outcomes in the assessment process (after it is built).
### Table 11 Healing Analysis

<table>
<thead>
<tr>
<th>Patients</th>
<th>One-Patient Dept.</th>
<th>Visitors</th>
<th>Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demands &amp; Solution</strong></td>
<td><strong>Relieve Pressure</strong></td>
<td><strong>Balance positive/negative energy</strong></td>
<td><strong>Social support</strong></td>
</tr>
<tr>
<td><strong>Types of users</strong></td>
<td>View to nature</td>
<td>Being in nature</td>
<td>Walking</td>
</tr>
<tr>
<td><strong>Patients</strong></td>
<td>MG</td>
<td>MG</td>
<td>MG</td>
</tr>
<tr>
<td><strong>One-Patient Dept.</strong></td>
<td>MG</td>
<td>MG</td>
<td>MG</td>
</tr>
<tr>
<td><strong>Visitors</strong></td>
<td>MG</td>
<td>MG</td>
<td>MG</td>
</tr>
<tr>
<td><strong>Staff</strong></td>
<td>MG</td>
<td>MG</td>
<td>MG</td>
</tr>
</tbody>
</table>

**Legends:**
- MG: Medicinal Garden
- CG: Children's Garden
- BG: Body Garden
- PG: Meditation Garden
- IPs: Indoor Plants

**Notes:**
- Children's Garden: CG
- Serene Garden: SG
- Resting Garden: BG
- Fitness Garden: FG
- Horticultural Garden: HG
- Pocket Garden: PG
- Meditation Garden: MG
- Roof Garden 1 (Inpatient Dept.): BG-I
- Roof Garden 2 (Outpatient Dept.): BG-O
Along with the Healing Analysis Table (table 11), graphic depictions for the identification of potential outcomes have been developed. Figures 81-83 depict the process to be followed in the assessment process, and represent the hypotheses presented in this creative project. The facial expression icons communicate the anticipated feelings of the users, reflecting their improvement when they walk through/utilize various gardens or a series of gardens.

It is important to understand the protocols within the context of the charts previously presented (Tables 7 - 11). For example, in Table 7, unhappy children were identified as one type of user. This patient, hypothesized, needs personal space for calming and interesting elements for positive distraction. The resting and children’s garden have been designed with this in mind, and after playing with water features or other children, it is anticipated that the child would feel better. Further, on the way back to the Outpatient Department, the child will experience several other gardens, indoor plantings and views. Figure 81 graphically depicts this experience with facial expression icons and in cross section form.

The healing experiences for users from three departments have been depicted graphically (Inpatients, Outpatients and those receiving treatment in the Chinese Medicine Department) (see figures 81 – 83). In these depictions scenarios for the various patients noted in previous charts are provided.
Fig. 81 Healing Experience of Users from Outpatient Department

Fig. 82 Healing Experience of Users from Inpatient Department
To further explore the connection between landscape and user experience, examples of the facial expression icons in relationship to landscape views were developed. This provides a more detailed view of the hypothesis set forth (see figures 84 – 87).
Fig. 84 Healing Experience of Type 1 Visitor

Fig. 85 Healing Experience of Type 2 and 3 Patient
Fig. 86 Healing Experience of Type 3 Children

Fig. 87 Healing Experience of Type 2 Adult
Conclusion:

The central ideas of Chinese health-preserving theories provided a solid foundation for the development of goals and objectives for the design of Wuhan Iron & Steel hospital. In this process the most important principle was found in the logic of Yin and Yang, which is reflected in almost all aspects of the design process, including the selection of materials (soft or hard), the size of the spaces (big or small), and in the design of active or passive activity spaces. With the exception of the guideline specifically related to local culture and historical background of Wuhan Iron & Steel hospital, the guidelines developed here are applicable to hospitals in other parts of China.

Furthermore, to fully achieve a user-oriented design, hypotheses of various user experiences were explored. The graphic depictions of these hypotheses provide the basis for future protocol development for post occupancy assessment protocols.
CHAPTER 7 CONCLUSION

This creative project explored ways to apply traditional Chinese health preserving philosophies and Chinese culture to the therapeutic landscape design of hospitals in Chinese urban settings. The health preserving philosophies included Chinese Geomancy, Taoism Regimen and Traditional Chinese Medicine. Traditional Chinese culture influenced the process considerably: techniques and approaches used in the art of classic Chinese garden design as well as the materials used in these settings are present in multiple forms and places in the proposed garden concepts.

The results of this project include general design guidelines for integrating therapeutic gardens in Chinese urban hospitals, design concepts for gardens on the grounds of Wuhan Iron & Steel Hospital (illustrating the application of the aforementioned design guidelines), and draft healing assessment charts for evaluating the success of the gardens from a therapeutic perspective.

Literature findings revealed a number of important patterns that contributed to the development of this project. One significant finding was that all of the traditional Chinese health-preserving philosophies shared central aims: for humans
to achieve holistic harmony with nature, by enhancing physical fitness, preventing disease, postponing aging and prolonging life. This focus on an interwoven relationship between human beings and nature proved to be a fundamental principle in the design process. A second guiding factor was found in the philosophical underpinnings and methods employed of classic Chinese garden design. Known for evoking the natural world in an artistic manner, Chinese gardens offer spacious experiences in small spaces, derived from creative layouts with rocks, plants and water. Bringing the distinctive combination of Chinese classic garden design approaches and traditional health-preserving philosophies into the urban hospital environment has the potential to provide patients, staff and visitors with valuable experiences.

In depth investigation into traditional health-preserving theories and Chinese culture resulted in design direction. This included what to consider when creating spaces for healing exercise, how to select a site and suggestions for planting design details. Daoism offered direction in terms of exercise, pushing to include quiet exercise to nourish the spirit and dynamic exercise to feed the body. Chinese geomancy theory guided site selection and balancing processes, providing methods to ensure Yin Yang properties were addressed. And the Five Phases theory from TCM specifically influenced the planting design of the site. This included the arrangement of five zones and plant lists for specific planting beds.

In this project, how the guidelines were applied to the landscape design of Wuhan Iron & Steel Hospital was influenced by a number of site factors, including
how much space was available, therapeutic objectives being employed by medical staff, the surrounding vehicular circulation, and the general regional culture.

Because of its tight urban location some aspects of the design process (as directed by the health preserving philosophies) could be achieved, while others could not. For example, no mountains existed on or near the site, so this element was not a part of the end design. The principles of Yin Yang, however, were applied throughout the site. The concept of Yin Yang has broad meaning is found in many Chinese theories, and has multiple applications in landscape design. For these reasons its applicability is wider.

The proposed design optimizes garden access and use (through maximizing the number of users and garden use), opening the opportunity to apply these ideas to other sites. Like Wuhan Iron & Steel Hospital a typical general hospital in China is centralized with all types of user groups related to medical treatment (including inpatients and outpatients with different diseases, doctors and nurses specializing in the treatment of different diseases, and visitors). Further, hospitals located in urban areas have limited land. These functional realities, along with the strong connection to local culture and TCM, clearly illustrate the fit between the guidelines presented here to the potential of site design at many hospitals in China.

To better understand needs of various users, I hypothesized the impact of the gardens, particularly in terms of therapeutic benefit. The healing assessment charts provide opportunity to assess different groups of users by differentiating their walking routes, purpose of visits, age ranges and duration of stay. The framework
developed opens up the opportunity to better understand the connections between landscape, health, and healing in urban hospital environments.

Through the process of developing and taking an integrated approach in this creative project some key avenues for further study were identified:

- Further understanding the connections between the plants chosen for the garden setting and the Five Phase Theory is necessary. Plant lists found for implementation of this theory differ considerably from article to article. It is apparent that our understanding of how different plants (and groupings of plants) can contribute to different healing functions is limited.

- Investigating how to design space to support education about Chinese traditional health-preserving philosophies, especially traditional Chinese medicine, is very important. Traditional Chinese medicine focuses on activating self-healing power and its therapies are closely related to daily lifestyle of individuals. However, some theories are very abstract, and study needs to be done to determine how to capitalize on this in the designed landscape. For example, with the Jin-luo system, Five Phase theory and Yin Yang theory, I used abstract blue pavements to refer the complicated Jin-luo system, while I relied on signage within the garden settings to educate about Five Phase theory and Yin Yang explanations. However, whether my solutions are effective in achieving my educational goals needs to be studied further.
Post occupancy evaluation is an important next step in this process. If the project gets constructed carefully, systematic review of the effects would provide necessary feedback to test the posed hypotheses. The draft healing assessment charts developed for this project provide a starting point in this process, though they would likely be refined to reflect the site and goals of the project being evaluated.

Though this creative project had its limitations it did bring to light some important opportunities. For one, it is apparent that the study of therapeutic gardens, and the opportunities to blend Western and Eastern approaches, is only in its infancy. Significant strides are yet to be made in evaluating the outcomes of gardens at hospitals and other health care facilities, and as this moves forward we can learn, as designers, how to better contribute to the improvement of therapeutic environments. Second, by looking at health preserving philosophies and traditional design approaches in China tremendous opportunities emerge in terms of the art of design in these settings. This makes this direction especially compelling, as it brings together both art and science in significant ways. And, finally, the changes proposed for Wuhan Iron & Steel Hospital, significantly alter the site, bringing a more natural, inspiring environment to the users of that space. Even in tight urban environments, landscapes can transform experience in a healthy way. For all of these reasons it is apparent this avenue of study has much to offer in terms of the design process and outcomes at health care facilities.
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