POLITECNICO DI TORINO

Master's Degree, Architecture For Heritage

Architecture as Medicine: Design Components That Accelerate Healing for Spinal Cord Injury in Hospital Environments

A Historical, Architectural, and Human-Centered Approach

Supervisor:
Prof. Elena Vigliocco
Department of Architecture and Design (DAD)

Candidate:
Nilay Yasar
Msc. Architecture for Heritage

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I thank my family. I take everyone who contributed to my recovery. I thank my professor. I thank myself.

Nilay Yasar

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INTRODUCTION

During the process of writing this thesis, whenever I told someone about my topic, everyone was surprised, wondering how I could find such a topic. I did not search for this topic much because I experienced it myself. My thesis subject was actually determined years ago due to an accident I had 8 years ago. I healed. Since that day i was willing to combine what i experienced and use the power of architecture, this beautiful profession I do, to benefit humanity. I believe that healing and curing with architecture is possible.
Nilay Yasar

Can architecture heal? This question is central to the idea of integrating design into medicine. While the fields of architecture and healthcare have historically run parallel, the emerging concept of healing architecture places design at the forefront of human well-being. For Spinal Cord Injury (SCI) patients, in particular, whose journeys to recovery are long, complex, and deeply personal, structures built for healing become more than environments; they become a form of treatment.

This thesis explores how architectural elements can accelerate the physical and psychological recovery of SCI patients. It argues that architecture is a critical contributor to the therapeutic experience.
Grounded in historical context and supported by a variety of case studies, this research examines how architecture can be used as medicine by using design components that could accelerate healing for Spinal Cord Injury in hospital environments. It also reflects my personal journey as a former SCI patient, offering an insider's perspective on the profound relationship between place and healing.

Chapter 1: From Body to Building, The Historical Bond Between Medicine and Architecture is, dedicated to understand deeply how architecture is effected by, and has a strong the relationship with, human and medicine.

Chapter 2: The Evolution of Hospitals, Healing Spaces Across Civilizations and Time, is the chapter of the history and the evolution of hospital designs by using case studies. Also by comparing them with one and all, it is aspired to thoroughly understand the development in different eras, discussing the architectural aspects and the background reasons of their designs.

Chapter 3: Spinal Cord Injury and Human Centered Architecture ,Designing with Empathy is examining the factors that may cause spinal cord injury, its physical and psychological effects on patients and treatment methods are discussed. In addition, the importance and fundamentality of empathy in designs for such a case are emphasized and architectural elements that can accelerate the patient's recovery or make them feel good are investigated.

Chapter 4: Healing Gardens as Therapeutic Architecture, Nature's Role in SCI Recovery examines the historical development of the concept of a healing garden and its importance in the recovery process of Spinal Cord Injury (SCI) patients. In this context, the research focuses on how natural elements that contribute to the recovery process can be used in gardens and how these elements can be integrated into architectural design.
The section also includes comparisons of architectural areas through case studies carried out at different scales.

Chapter 5: Interview Insights, dedicated to interviews with psychiatrists, physiotherapists, healthcare professionals and SCI patients were included in order to seek an answer to the question of "how can a more appropriate hospital be designed?" and preparations were made for the project phase.

Lastly in the **Chapter 6: Design Proposal, A Healing Space for Spinal Cord Injury Patients (Ex Ospedale Militare Alessandro Riberi)** represents the stage where the theoretical foundation of the thesis turns into a concrete architectural proposal. With the historical, conceptual and user-oriented data presented in the previous sections; a hospital spatial design that is sensitive to the needs of Spinal Cord Injury (SCI) patients, integrated with nature and accelerates recovery has been developed. The case study is the "Ex Ospedale Militare Riberi", located in Turin.

CHAPTER 1:

From Body to Building

The Historical Bond Between Medicine and Architecture

For the beginning of the first chapter, I prefer to start questioning before explaining. Architecture has been an ‘’ideology’’ that has persisted since the existence of humanity, bringing questions and the design that answers those questions. In this way, architecture "designs the humanity." In many of our actions, thinking about a space, any movement made in a space, giving life to a space; all these are part of relationship between humanity and architecture. With this strong relationship, what could be the impact of architecture on humanity?

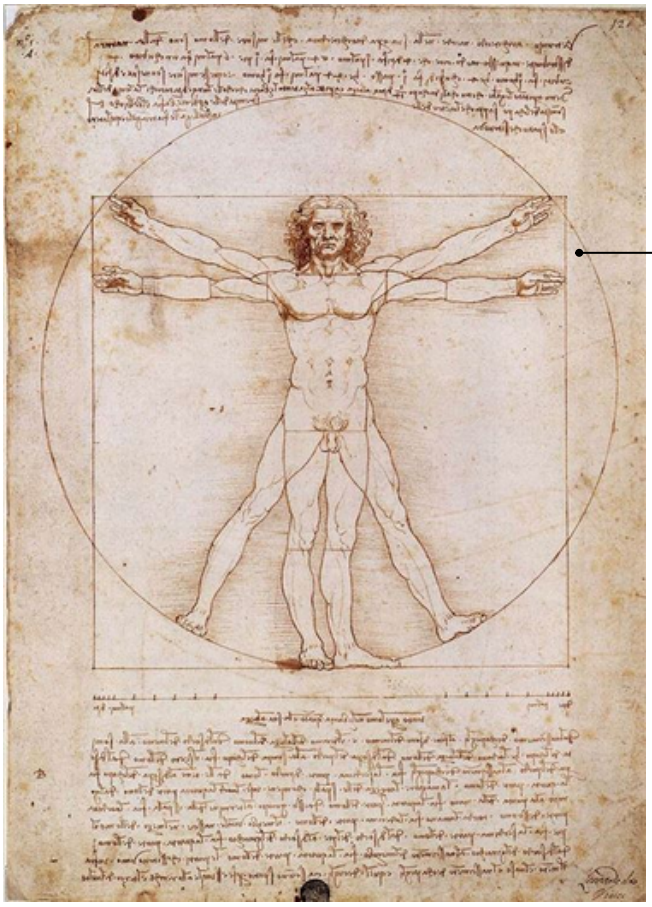
Vitruvius stated that every architect should study medicine, adding: "*Healthfulness being their chief object.*" According to him, unhealthy people can be healed through design; just as the examination of the interior of a building, as well as the interior of a person and medicines can inspire architecture. When humanity, health and architecture are so intertwined; is it possible for architecture to be a medicine for humans?

During the Renaissance, medical schools used casts of body parts, and design schools like in Florence, while doctors analyzed humans, architects analyzed historical buildings and sectioned them.
Later in the modern century, particularly the 19th century, a different approach was developed, focusing on subjects like unhealthy spaces, sun, ventilation, light, terraces, and hygiene. According to Le Corbusier who is one of the pioneers of modern architecture, the house was actually a place of therapy and a *‘’machine for health’’*, emphasizing the importance of maintaining or increasing physical energy by highlighting its impact on human and psychological health.

Thus, in the modern age, diseases and bacteria had already started to shape architecture. Understanding of smooth surfaces, large windows taking in sunlight and fresh air also contributed to modern architecture.
Overall, even though duty of architects did not include being doctors but aimed to provide psychological and neurological relaxation in the spaces; brings another question to the mind that ‘’ is it possible to accelerate the healing process through the architecture?’’

Architecture and medicine have always been closely connected. Architectural thought aligns with ideas of body and mind, portraying the architect as a healer and the client as a patie*nt.*
Vitruvius in the first century BC launched Western architectural theory by insisting that “All architects needed to study medicine: Healthfulness being their chief object." And added, *“Those who are ill can recover more rapidly through design, restoring the structure of those weakened by illness.”*

Vitruvius explores the inner functions of the body as much as he examines the inner workings of structures. Medical theories serve as a sort of basis for architectural thought. In this way; architecture itself becomes a subset of medicine. In the Renaissance ages instead, the primary mention of architecture was no longer the complete body; instead, its health governed by the four humors, but a dissected, fragmented, and examined body. Just as Renaissance medical schools used body parts, also design institutions used fragments of historical building structures for instruction. Anatomical dissection of hospitals also became a key component of the training in architecture. As physicians explored the interior of the body by dissecting it, architects tried to comprehend the inside of buildings by making sectional cuts through them. Leonardo Da Vinci also used human physics to understand ergonomic measurements and sketched sections of the human body to understand sections in architecture.



Anatomy - Leonardo da Vinci
The Vitruvian Man, c. 1490
Gallerie dell'Accademia, Venice, Italy.
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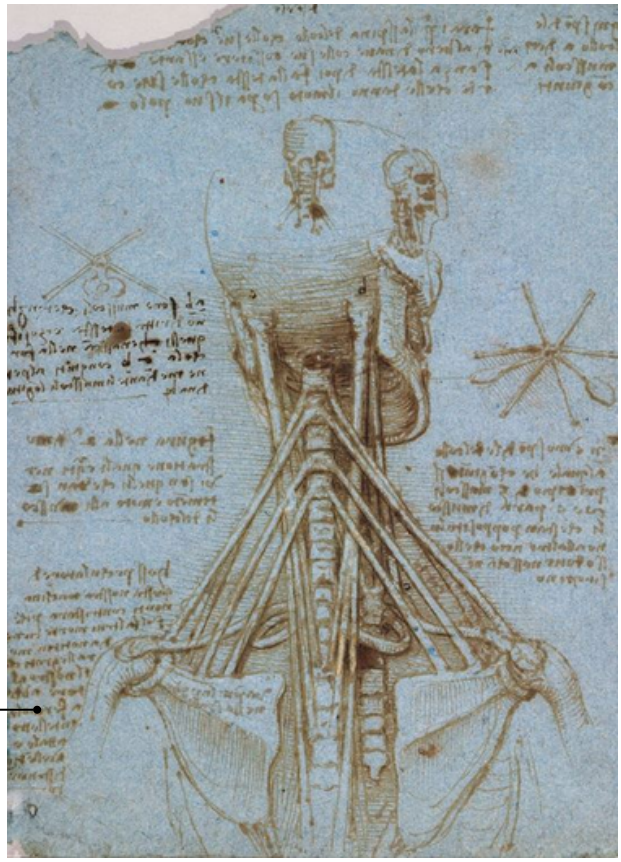

Anatomy - Leonardo da Vinci
Neck Muscles, c. 1513
Royal Collection, Windsor Castle, England.
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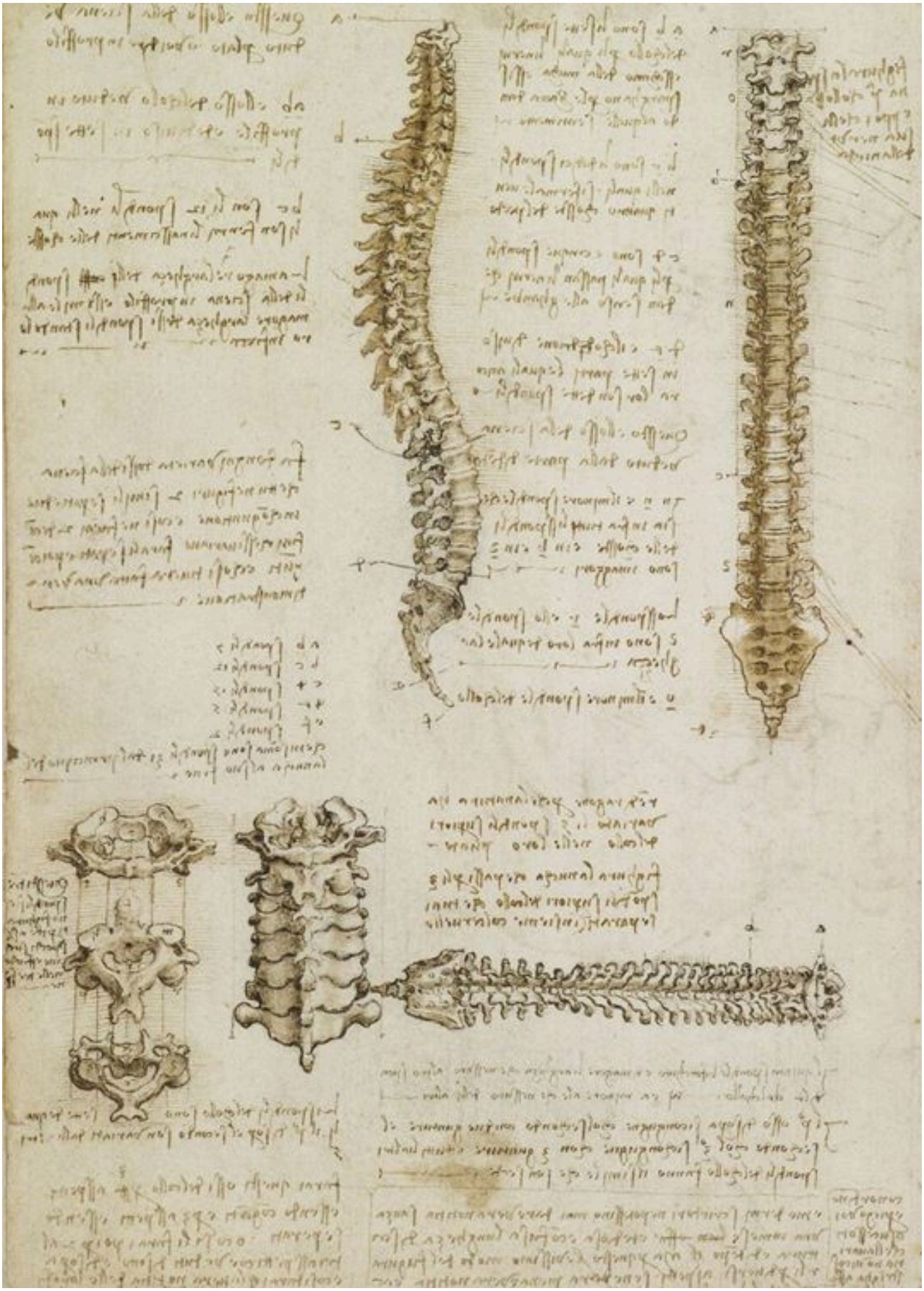

Anatomy - Leonardo da Vinci
Spine, 1508-1509
Royal Collection, Windsor Castle, England.
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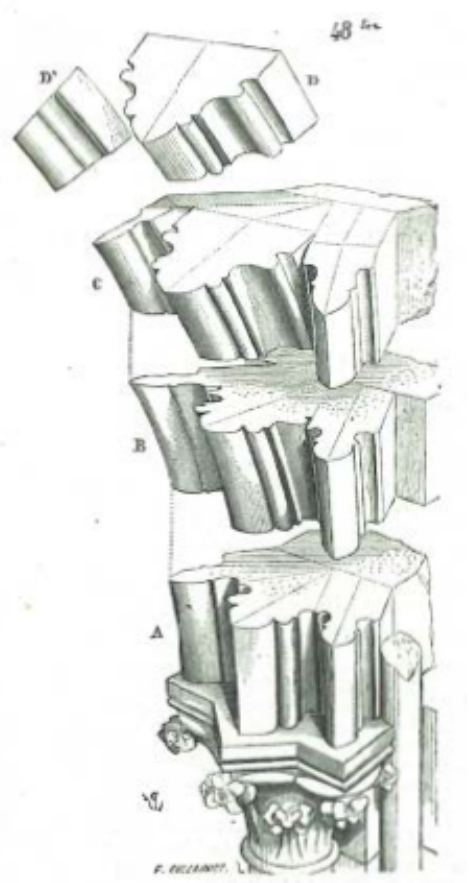
Similarly, in the mid-nineteenth century, Viollet-le-Duc illustrated his perspectival sectional cutaway illustrations depicting medieval structures that kind of reminding spine of human. (Fig. 1)

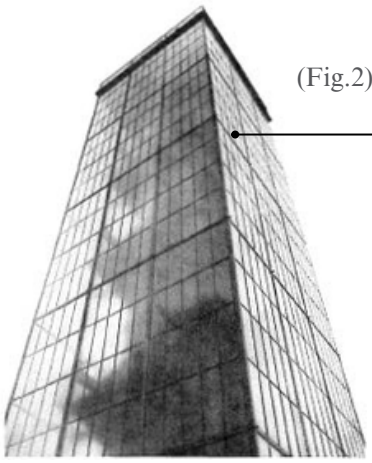
In the twentieth century, as medical representations evolved, so did architectural representations. The widespread adoption of X-rays introduced a new perspective on architecture. Contemporary buildings began to resemble medical imagery, with transparent glass facades exposing the hidden details of their structures just as X-Rays.(Fig.2) Architectural solutions were developed based on the causes of diseases. A typical medical text attributed the cause of the illness to, among other factors, insufficient physical activity, a sedentary indoor lifestyle, inadequate ventilation, lack of natural light, and negative emotions; and medical factors that diminish quality of life became the focus of architecture.

Nineteenth-century architecture was labelled as unhealthy. Sunlight, illumination, ventilation, physical activity, rooftop terraces, sanitation, and cleanliness were proposed solutions in order to stop that phenomena.



(Fig.1): Eugéne Viollet Le Duc, Tas De Charge
Beatriz Colomina, *X-Ray Architecture: Health and Architecture from Vitruvius to Sick Building Syndrome,* (Zurich: Lars Müller Publishers, 2019), 15.

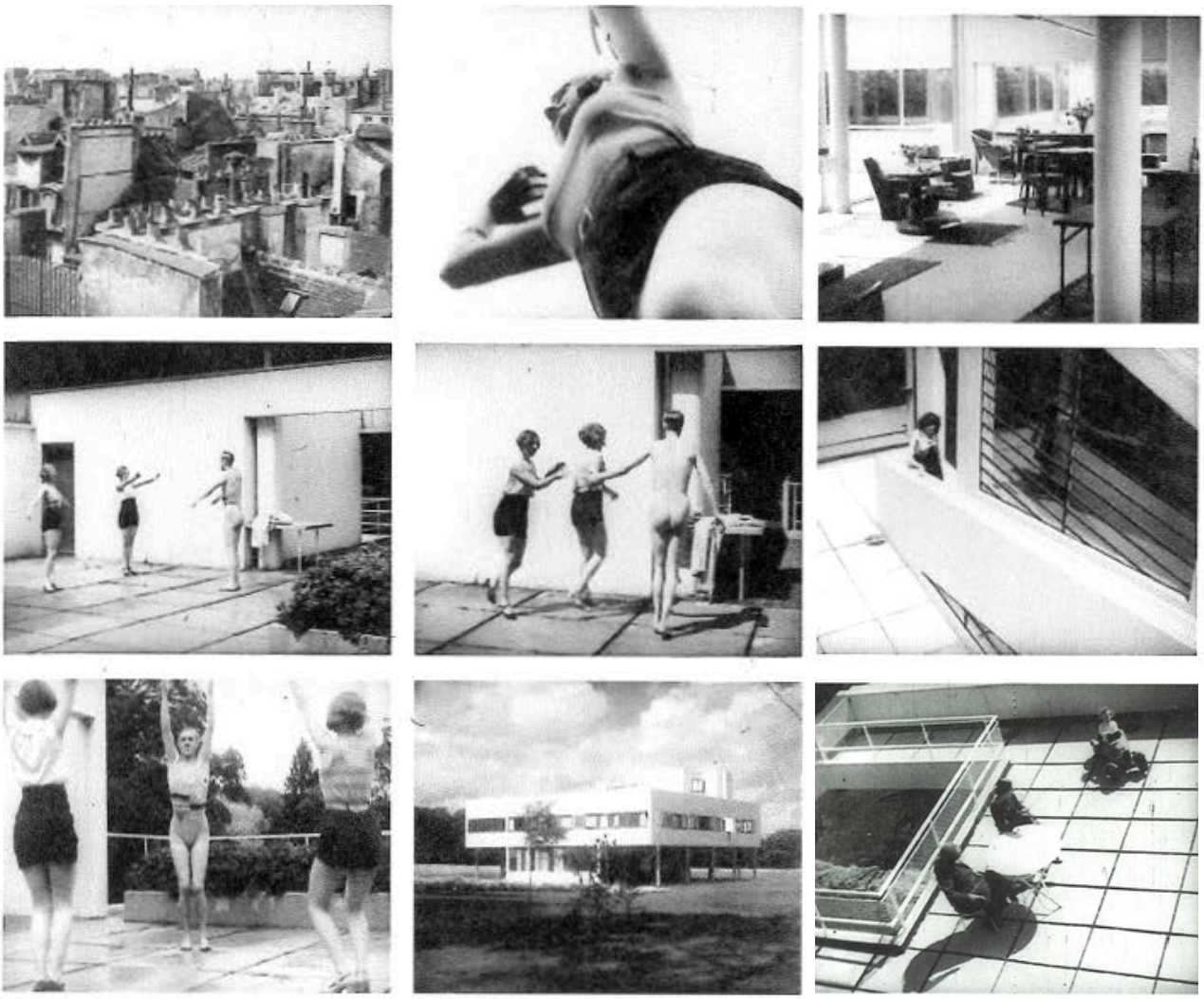
In addition, since tuberculosis became widespread during this period, also necessary to mention the impact of this particular illness in architecture. The traditional role of architecture in providing order takes on different meanings with different diseases. The restructuring of the medical body with new sciences leads to the reorganization of architecture.



(Fig.2): The Viewing Glass Tower of the Chamber of Commerce Pavilion. Bruno. 1928

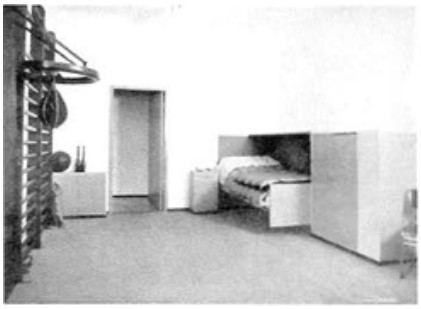
A chest X-ray progress at radiology department at the Cochtn hospital. Paris. 1914
Beatriz Colomina, *X-Ray Architecture: Health and Architecture from Vitruvius to Sick Building Syndrome,* (Zurich: Lars Müller Publishers, 2019), 16.

For example, when tuberculosis spread, people could not go out because of the contagious disease and their areas became narrow. Le Corbusier proposed a different approach to make people's living spaces a healthy place and gave the approach of medical argument from 'the home scale' to 'the urban scale'. As result, he suggested cutting through the old city and exercising on the rooftop garden which was a new approach of this century. In fact, as can be seen from the Figure 3, there has always been a need for active movement, open air and having a good time for healing .

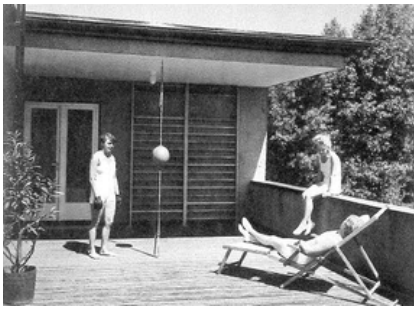


(Fig.3): Le Corbusier's rooftop philosophy
Beatriz Colomina, *X-Ray Architecture: Health and Architecture from Vitruvius to Sick Building Syndrome,* (Zurich: Lars Müller Publishers, 2019), 21

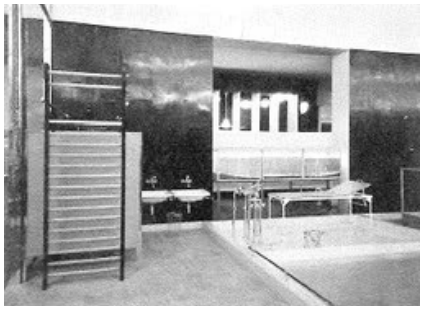
And so, modern architecture also presented itself as healthy architecture, stripping away all the excess weight of the neoclassical tradition. The modern house was understood not as a kind of medical device for simply taking care of the body, but as exercise equipment designed to strengthen and restore the body to health.



Marcel Breuer, bedroom for Piscator, Berlin,1927



Theo Effenberger, house in the Werkbund housing exhibition, Breslau, 1929



Walter Gropius, communal gym ror apartmenthouse.Werkbund exhibition. Paris, 1930

(Fig.4): Beatriz Colomina, *X-Ray Architecture: Health and Architecture from Vitruvius to Sick Building Syndrome,* (Zurich: Lars Müller Publishers, 2019), 28-29

Afterwards, not only Le Corbusier, but also the architects mentioned in Figure 4 used activity elements in their interior designs that would motivate people to take action, not only in exterior spaces but also in interior spaces, as shown in the photographs. Also by looking at these photographs, clear that the common point of all of them is that white color is preferred for interior and exterior facades. The reason for this is that white surfaces are not only a means of hygiene and preventing the spread of germs, but also as an anesthetic that calms nerves and reduces stress, especially for soldiers participating in the war, which was the problem of these era.

Moving on to modern era architect Richard Neutra, believed that architecture should not only build buildings but also improve people's psychological health also for the people who had affected by the war. Neutra saw architecture as a kind of therapy tool and noted that every building, every room should be a "healing area". He even argued that the architect should not only be a designer, but also a psychoanalyst who understands people and designs spaces according to their spiritual needs.

Overall, architecture, each new health theory, each disease with its own content and characteristics, has associated the building with the medical body and has also shaped itself by taking into account the person's psychology. The discipline of architecture, extending from the principles of Vitruvius to today's innovations, has developed to address both physical and mental health. Every architectural element developed as a solution to diseases shows that architecture is a tool for healing and restoration. The ability of architects to design spaces suitable for the solution of health problems is evidence that they can contribute to the healing process with spaces that promote relaxation and recovery. This progress reflects that architecture, like medicine, is a science adapted to diagnose, treat and support the well-being of humanity.

CHAPTER 2:

The Evolution of Hospitals

Healing Spaces Across Civilizations and Time

3000 BC

invention of writing

476 AC

Fall of Roman Empire

ANCIENT AGE

Hammurabi

MESAPOTAMIA[1]

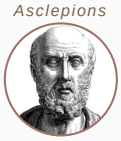
- Medicine established in Mesopotamia.
- The first prescription of doctor, and their fees, have founded during the rule of dynasty of Hammurabi.(1728–1686 BC)

INDIAN HOSPITALS[2]

- Well organized health care were constructed in in 600BC.
- Throughout the rules of King Asoka, the Indian hospitals began to be like 'modern' hospitals.

King Asoka

Asclepions



Hippocrates

ANCIENT GREEK HOSPITALS[3]

- For the Greek Era instead, for centuries, they believed in miracles, rituals, magic and power of God in order to be healed. Humanity tried to heal in the Asclepions founded in Epidaurus in the 5th century BC.
- Greeks changed the ideology and preferred to recognize the natural causes of diseases and ''logical'' methods of healing thanks to Hippocrates.

ANCIENT ROMAN HOSPITALS[4]

- Influence of Ancient Greek Era has seen with different approach that patients be treated in a place far from the city center, like Tiber Island.
- Emperor Constantine played an important role and his decree in 335AD encouraged proper construction of Christian hospitals.

Tiber Island

Emperor Constantine

St. Basil of Caesarea (in Cappadocia, Turkiye)

Saint Basil

EARLY CHRISTIAN HOSPITALS [5]

- Volunteers again became role models in the establishment of such small hospitals. St. Basil of Caesarea (in Cappadocia, Turkiye) was a pioneer in the hospitalization and care of the disabled and sick.
- The fall of Rome in 476 AC caused a long scientific stagnation in Europe, but hospitalization still continued to advance thanks to Christian monastic influences.

14TH CENTURY

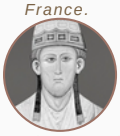
1492 AC

Columbus discovered America

16TH CENTURY

THE MEDIEVAL AGE

Hotels Dieu in Lyon, France.



Pope Innocent III

ISLAMIC HOSPITALS[7]

- For the Arabs, the hospital system was developed during the time of Muhammad.
- Islamic physicians, as well as doctors, were responsible for the establishment of pharmacy and chemistry as sciences.
- Separation diseases according to their departments were crucial.
- Results of investigations used as educational sources.

THE MIDDLE AGE HOSPITALS[6]

- Surgery was avoided in order to ''not to disturb the body'' and religious communities had take care of the ills.
- ''Hippocratic'' period was lost
- Despite, hospital construction continued in Europe because in 1198, Pope Innocent III encouraged rich Christians to build hospitals in each town, The oldest hospitals still in existence are the Hotels Dieu in Lyons and Paris, France.

MODERN AGE

RENNASAINCE [8]

King Henry VIII

St. Bartholomew

St. Thomas

St. Mary of Bethlehem

- The mid-fifteenth century, Europe sent its best physicians from its major cities to Italy towards further training. Renaissance was the era of the great institutions of medicine.
- The most important impact of the Renaissance on the development of hospitals, was the enhancement of hospital management, the reintroduction of the separation of patients by disease, and the superior quality of medicines available in hospitals.
- ''Old methods'' has improved.
- During the English Reformation, which lasted from 1536 to 1539, hospitals associated with the Catholic Church were controlled by King Henry VIII and he ordered these churches to be repurposed for non-religious uses or demolished. Only strong hospitals survived in London such as St. Bartholomew, St. Thomas, and St. Mary of Bethlehem.

1760 AC

Industrial Revolution

17TH CENTURY

18TH CENTURY

MODERN AGE

LATE MODERN AGE

HOSPITALS IN 17TH- 18TH CENTURIES[9]

Leuwenhoek Microscope

Marcello Malpighi

St. Peter's of Bristol

Asclepions

- The aim was to find out how things happened, rather than why they happened.
- Different tools such as thermometers began to be used in the field of healthcare.
- The most significant breakthrough in the advancement of medical and scientific knowledge was the invention of microscope that invented by Marcello Malpighi (1628–1694) and Anthony Van Leeuwenhoek (1632–1723).
- In the 18th century, there was an increase in hospital construction in England, the best known of which was St. Peter's of Bristol.
- While the discovery of the microscope played an important role in the seventeenth century; medicine was further developed in the eighteenth century and the discovery of the vaccine became the most important medical achievement.

HOSPITALS IN 19TH CENTURY[10]

- The construction of hospitals sped up in every major city with Industrial Revolution.
- The nineteenth century is the keystone of the hospital history because of the role of Florence Nightingale and her deep ideology about the hygiene.
- Upon her return to England, Nightingale established the first nursing school in 1860 for nurses in St. Thomas' Hospital in London that mentioned in Renaissance period as one of the hospital that has been kept its existence.
- With the discovery of the x-ray by Wilhelm Konrad Roentgen, the foundations of the modern hospital were completed (1845–1923).
- Hospitals are no longer structures where the sick and homeless take shelter, but structures through which patients can be diagnosed and intervened with the help of inventions and

Florence Nightingale

x-ray by Wilhelm Konrad Roentgen

Wilhelm Konrad Roentgen

1945 AC

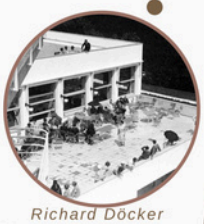
End of World War II

LATE MODERN AGE

- According to Nightingale, the environment had both a physical and psychological effect on patients. She also thought that form, color, light and every other detail, including interior design and furnishings, could have an impact on the patient.
- Richard Döcker Waiblingen Sanatorium 1928,Lubetkin's health center in Finsbury London, Aalto's sanatorium at Paimio, Finland are some of the examples for the hospitals that has designed by given architectural details in this era.

CONTEMPORARY AGE[11]

- The consummate contemporary hospital is a healthcare building that has the capacity to meet the care needs of patients as well as being equipped technology to provide clinical training and to medical students, nurses and also other healthcare professionals.
Today, the ''manufacturing'' of the hospitals must be regulated by laws and regulations.
- Hospitals are no longer the only place for medical care but it branched out into many fields; more medical treatments are now also done outside of hospitals; like in clinics or at home without needing to stay overnight in a hospital, also provided more healthcare rehabilitations that works for a particular illness.
- Previously, hospital rooms were segmented according to diseases, but now it is possible for hospitals to be segmented according to diseases.
- Graz West State Hospital in Graz, Austria, Meyer's Children's Hospital in Florence, Italy, and Centre for Cancer and Health in Copenhagen Denmark; are the contemporary architecture healthcare projects that are not only considered healing of specific illness but also giving importance to healing of the mental health by their designs.



Richard Döcker Waiblingen Sanatorium 1928

Aalto's sanatorium at Paimio

Lubetkin's health center in Finsbury London

Graz West State Hospital in Graz, Austria

Meyer's Children's Hospital in Florence, Italy

Centre for Cancer and Health in Copenhagen Denmark

The field of health has undergone numerous changes from past to present, and the beginning of these developments covers the period from Ancient Age times to today and beyond. These changes were not always linear and scientific. When we consider the broader situation in India and the Ancient Greek Era, intangible assets such as spiritual or miraculous were at the forefront; although different ideas regarding to development were produced in the Age Roman period, religious assets were taken into consideration during health growth in the Early Christian and Medieval Age periods that existed afterwards.

On the contrary, despite the fact that different methods were tried in the Islamic era, such as researches on science and the separation of patients' threats; the real "rebirth", as the name suggests, took place during the Renaissance period. In this Era, physicians went to various schools to receive training and enlightenment was experienced. In addition, the development of the patients was followed, taking into account the separation method tried in the previous period; support for science and hospitals rather than religion has increased. Subsequently, in the 17th and 18th centuries, a different perspective was developed and the question "how" replaced the question "why". Since this period, the care has been taken to base studies on evidence rather than hypotheses. Previously and newly invented tools have now begun to be used for health purposes; inventions have been made especially and only in the field of health.

Later on, even there were different perspectives in different parts of the world in terms of Europe and America, the common point was that as result, hospital construction works have increased. Later, in the 19th century, numerous advancements ensued the previous years, and the ‘’real’’ foundations of modern medicine and hospitals were laid in this century. The Industrial revolution and wars that took place throughout this duration and made an undeniable contribution to this evolution that once more hospital structures have increased. The rise in the importance given to hygiene was most evident in this period, under the influence of Florence Nightingale and many other role models.

By the evolution; several different ways have been tried; segmentation of ills in the hospital rooms, construction of hospitals placed out of the city and intangible assets became tangible. Modern healthcare system has been defined and hospitals are no longer just shelters for the homeless or orphans; but systematic structures controlled by private and semi-private regulations. Moreover, beyond privatization; with the establishment of non-hospitals, patient threats began to be provided not only in hospitals but also in different health institutions and today, in the concept of contemporary hospitals, we see that hospital rooms have completely moved away from the old ward system and have become personalized. In fact, instead of segmenting patients, hospitals are being segmented, leading to the establishment of specialized health centers focused on specific diseases.

2.1) ANCIENT AGE

2.1.1) Mesopotamia

Medicine, for the first time 4000 years ago established in the ancient region of southwest Asia that called as Mesopotamia. The first prescription of doctor, and their fees, have founded during the rule of dynasty of Hammurabi (1728–1686 BC) in which came from Sumer in Ancient Babylon. This affair of Mesopotamia has also effected in the manner of growth of the Egyptian, Hebrew, Persian and also Indian cultures.

Participants: Hammurabi and Hammurabi's code of laws

2.1.2) Indian Hospitals

In India, historical papers demonstrate that well organized health care were constructed in 600BC.The Buddhist religion, which originated in India in this era, created a system of monasteries with institutionalized health facilities in and around them. Throughout the rules of King Asoka, the Indian hospitals began to be like 'modern' hospitals. They already paid attention to be in the service of healthcare needs of inhabitants which supports it that in every ten villages, a person who responsible from health has been appointed.

Participants: King Asoka

2.1.3) Ancient Greek Hospitals

For the Greek Era instead, for centuries, they believed in miracles, rituals, magic and power of God in order to be healed. Humanity tried to heal in the Asclepions, which were temples dedicated to Asclepius the god of medicine, founded in Epidaurus in the 5th century BC. (Fig.5) While sleeping in these temples, they would tell the dreams they had to the priests, and the priests would interpret these dreams and direct the patients to appropriate therapy. Obviously, these therapies were performed with a belief in mystical powers.

(Fig.5): Remains of the sanctuary of Asclepius, Francois Pieter Retief, "Epidaurus: The Evolution of Hospitals from Antiquity to the Renaissance," Acta Theologica 30, no. 2 (2010): 217.

https://visitworldheritage.com/en/eu/sanctuary-of-asclepius-at-epidaurus-greece/37725626-da68-4581-9736-1df11c27b248

(Fig.6): Incubation sleep: Asclepius, attended by Hygiea, treats a sleeping woman. Votive relief, 4th century BC. Piraeus Museum.
Francois Pieter Retief, "Epidaurus: The Evolution of Hospitals from Antiquity to the Renaissance," Acta Theologica 30, no. 2 (2010): 218

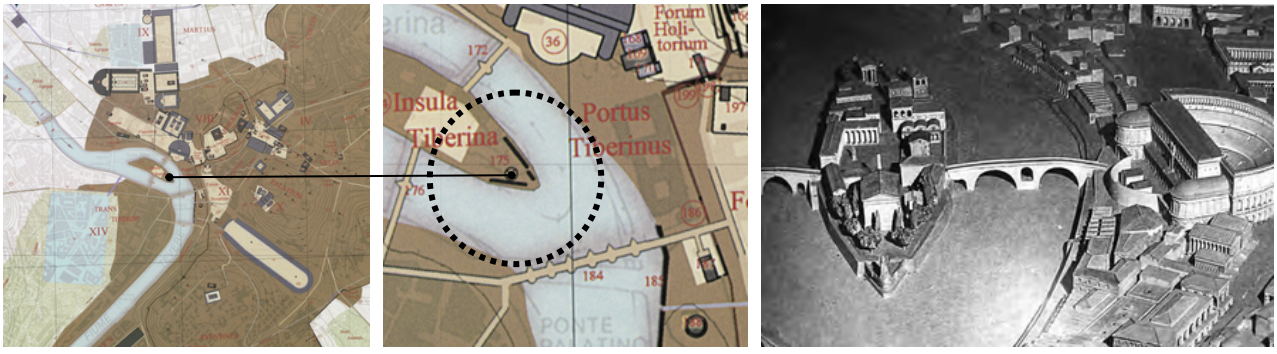
However subsequently, Greeks changed the ideology and preferred to recognize the natural causes of diseases and "logical" methods of healing became more important for them. Additionally, they cared more about anatomy and physiology rather than the superstitious and religious facts.

The pioneer of this evolution is Hippocrates who began using auscultation, performing surgical operations, and providing historians with detailed records and descriptions of diseases of his patients, from tuberculosis to ulcers in 480 BC.

Participants: Asclepius, priests, Hippocrates
Case Study: Asclepius temples

2.1.4) Ancient Roman Hospitals

In this age, we still see the Greek influence in the services provided for health. To support, the initial formal tread taken by the Romans in the field of health was the indication of a temple of Aesculapius on the island of Tiber in 293 BC. Additionally, Priests in Epidaurus came up with different ideas in terms of hygiene and suggested that patients be treated in a place far from the city center. Therefore, the temple of Aesculapius was built on an island in the Tiber, outward of Roman territory.



(Fig.7): Reconstruction of the Asclepieum on the Tiber island.

- https://www.digitalaugustanrome.org/records/aesculapius-aedes/#/filter:4
- Francois Pieter Retief, "Epidaurus: The Evolution of Hospitals from Antiquity to the Renaissance," Acta Theologica 30, no. 2 (2010): 218

However, discrimination occurred among the people for the reason that during this period, patients who were needy, brought where the doctor was; threatened there, and then sent home; meanwhile the wealthy people were visited by the doctor at their homes. During this period, the deprivation of the hospital was still felt; if the hospital system had been established, patients would have kept up with that particular system but not private homes. However, with the Roman Empire expansion, some changes began.
Although infirmaries were established for that has health issues, a hospital system was developed only among the military after this era. Because during the expansion, it was not possible to move wounded soldiers to home or elsewhere for treatment. Structures made of stone and wood for the soldiers improved their health care building capacity which medicines were stored. Looking at the hospital history of the Romans, Emperor Constantine played an important role and his decree in 335AC encouraged proper construction of Christian hospitals. However it could not be possible to built an efficient construction until 369 AC. Consequently, the hospital institution of Roman was made possible by the benefactors in 394 AD.

Participants: Priests, Emperor Constantine, benefactors
Case Study: Tiber island

2.1.5) Early Christian Hospitals

With the swift rise of Christian monasticism, philanthropic efforts increased in monasteries. Health facilities inside the monasteries designed for the care of monks were opened for use as infirmaries. Over time, the infirmaries also accepted civilian patients, and the treatment initially provided by the monks was enhanced by the help of doctors from outside the institution. In this way, monasteries played a significant role in the development of healthcare and the establishment of hospitals.

During this period, volunteers again became role models in the establishment of such small hospitals. St. Basil of Caesarea (in Cappadocia, Turkiye) was a pioneer in the hospitalization and care of the disabled and sick. He established a Basilica in Caesarea in 369 AC; This was a hospital with as many wards as there were diseases, and there was even an area for lepers who had once been kept in isolation and were now being truly cared for for the first time. The hospital also had expanded rooms for medical personnel, workshops, hospices for visitors and the needy, and a vocational school.

This understanding continued for many years and the monasteries accommodated a wider range of patients, orphans; and monasticism increased in other cities as well. The fall of Rome in 476 AC caused a long scientific stagnation in Europe, but hospitalization still continued to advance thanks to Christian monastic influences.

Participants: Monks, St. Basil of Caesarea

2.2) THE MEDIEVAL AGE

2.2.1) The Middle Age Hospitals

During this period in medicine, religious progress transpired rather than the rational progress. Surgery was avoided in order to ‘’not to disturb the body’’ and religious communities had take care of the ills. The rational, non religious approach that characterized Greek medicine during the Hippocratic period was lost; instead, hospitals became church.

Despite, hospital construction continued in Europe. In France, the oldest hospital of Lyon has built and it is still in existence as the Hotels Dieu of Lyons. In n Belgium, in the twelfth century, the still active St. John's Hospital was established. In Germany, the growth of hospitals transpired largely in the thirteenth and fourteenth centuries. The main reasons for this is that in 1198, Pope Innocent III encouraged rich Christians to build hospitals in each town, increasing incomes from marketing with the Crusaders.

Case Study: Hotels Dieu, St. John's Hospital
Participants: Christians, Pope Innocent III, Holy Ghost and the Lazarites.

2.2.2) Islamic Hospitals

Arab medical inventiveness occurred from the Persian Hospital that was in Turkiye in the 6th century. After returning to their country, they were able to establish well organized health centers. For the Arabs, the hospital system was developed during the time of Muhammad. What is more, the establishment of mental hospitals began there 10 centuries before Europe. In addition, Islamic physicians, as well as doctors, were responsible for the establishment of pharmacy and chemistry as sciences. Some of the best known massive hospitals in the Middle Ages were in Baghdad, Damascus and Cairo. In particular, the hospital and medical school in Damascus had elegant rooms, a large library, and a great reputation for its cuisine.

In the Islamic Era which was 6th to 13th century ,the most important factor in Arab hospitals, unlike other hospitals, is that they separated diseases according to their departments.

It was crucial to move apart the wards for different diseases; such as fever, eye diseases, diarrhea, wounds and gynecological conditions etc.. Even after that, the segmentation has been continued to be the main feature of Arab hospitals in every stages. For example, after recovering the sufferers, they were separated from sicker patients and arrangements were made for outpatients. Also, case reports were collected and used for educational purposes.

Participants: Mohammed, Islamic Physicians
Case Study: Damascus

2.3) RENAISSANCE

The Renaissance period is considered the spearhead of many innovations, as well as the pioneer of great awakenings in the medicine and treatments. This period lasted from the fourteenth century to the sixteenth century. It takes its name from ''rinascita'', which means ''rebirth'' in Italian, due to the belief connected to the cultural views of ancient Rome and Greece. The understanding of healing was again approached with a scientific and rational approach. The intellectual community of northern Italy was open to innovative and cosmopolitan concepts.

In the mid-fifteenth century, Europe sent its best physicians from its major cities to Italy towards further training. If the Middle Ages can be regarded as the era of the great hospitals, the Renaissance was the era of the great institutions of medicine.

Medical schools thrived in Germany and Central and Eastern Europe. Human anatomy began to be studied as a science, and animals began to be used in anatomy studies during this period. In England, the Royal College of Surgeons was established in 1506.

The most important impact of the Renaissance on the development of hospitals, was the enhancement of hospital management, the reintroduction of the separation of patients by disease, and the superior quality of medicines available in hospitals.

In this age, clinical surgery saw significant advances not only in Italy but also in France, particularly by aiming to improve the old methods, for example, studies to stop bleeding using ligatures, in the era of Ambrose Pare, who followed the rationalist approach. Epidemic chorea, sweating sickness, and leprosy had virtually disappeared, even though syphilis remained as common.

During the English Reformation, hospitals associated with the Catholic Church were controlled by King Henry VIII and he ordered these churches to be repurposed for non-religious uses or demolished. Only strong hospitals survived in London such as St. Bartholomew, St. Thomas, and St. Mary of Bethlehem, during this period. This was the first example of secular support given to hospitals.

Participants: Ambrose Pare, King Henry VIII

Case Study: Royal College of Surgeons, St. Bartholomew, St. Thomas, and St. Mary of Bethlehem

2.4) MODERN AGE

2.4.1) Hospitals in 17th and 18th Centuries

In the 17th century, the aim was to find out how things happened, rather than why they happened. Hypothesis were no longer accepted and investigations were carried out based on scientific studies. William Harvey's demonstration of the circulatory system of blood was his most important achievement in physiology and medicine of the seventeenth century. Different tools such as thermometers began to be used in the field of healthcare. The most significant breakthrough in the advancement of medical and scientific knowledge was the invention of microscope that invented by Marcello Malpighi and Anthony Van Leeuwenhoek.

John Gaunt's work, Made Upon the Bills of Mortality, underscored the substances of the population for the country, and in this context, the imperative of taking precautions for public well being was hold for the first time. In the book; strategies to safeguard and enhance health were also explained, such as dedicated facilities for huge number of sufferers, specialized maternity centers, governmental engagement in the well being of occupational units, and the formation of a central medical council to coordinate public health initiatives. But in this century, the issues discussed in the book remained as arguments and could not be officially implemented into the life.

In America, various developments occurred; hospitals were established in the newly colonized territories during the seventeenth century. In Europe, however, still did not have a union understanding. Old hospitals either fell under the maternal care of the Church, as in Italy; either were placed under the control of national or municipal governments, as in France and Germany; or new hospitals were initiated by an informed crown, as in Denmark, Germany and Austria.

In the 18th century, there was an increase in hospital construction in England. By the turn of this century a total of 115 hospitals had already been built, the best known of which was St. Peter's of Bristol that had built by parishioners. While the discovery of the microscope played an important role in the seventeenth century; medicine was further developed in the eighteenth century and the discovery of the vaccine became the most important medical achievement.

Lady Mary Wortley Montagu brought to England the Asian technique of variolation, which she had observed in Turkey, and discovered the process of creating resistance to the disease by injecting serum taken from the wound of a person into the skin of another person.

In addition to the mass construction of hospitals in the eighteenth century, it was also aimed to assimilate and develop the system work done in previous centuries,with existing technology.

Participants:William Harvey, Marcello Malpighi, Anthony Van Leeuwenhoek, John Gaunt; Parishioners

Case Study: St. Peter's of Bristol

2.5) LATE MODERN AGE

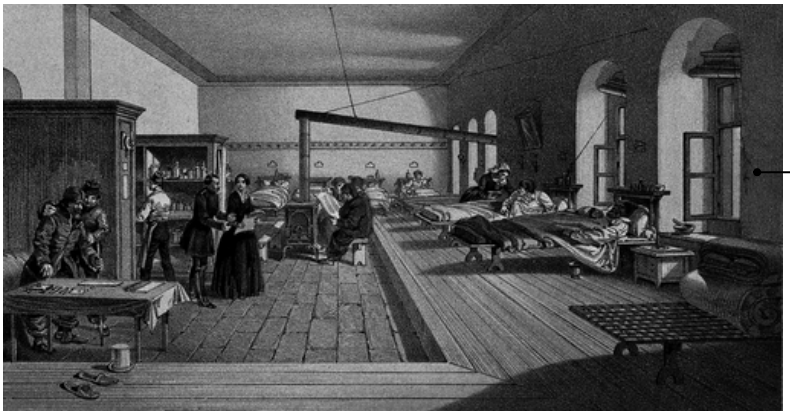
2.5.1) Hospitals in 19th Centuries

In the 19th century is the most critical period in the hospital timeline, marking significant strides towards modern medicine. Key activities that laid the foundation for modern hospital concepts emerged during this era. During the Industrial Revolution (1760-1840), the increase in the number of factory buildings and urban development to accommodate city growth led to a crowd in urban populations. The well being of factory workers became more crucial for the productive operation of factories, but also as the spread of infectious diseases posed a threat to all parts of society, the emphasis on curative methods grew. Consequently, the construction of hospitals sped up in every major city.

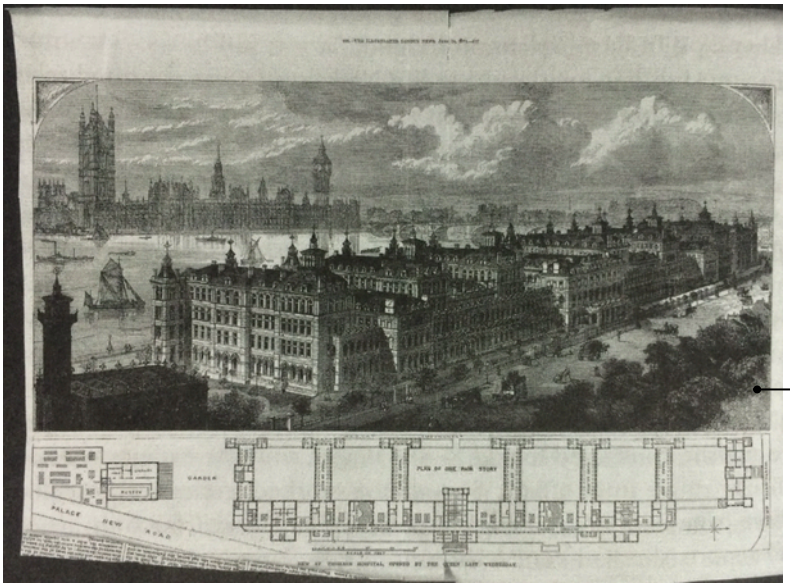
Historical developments in this century also affected the hospital development process. During the American Civil War (1861-1865), infectious disease outbreaks increased as large numbers of soldiers were brought together. As a result of this historic event, the two armies which are north and south, succeed ambulance systems that provided sufficient medical contribute, and also disciplined surgeons. These developments in America continued to positively affect the hospital system, and Veterans Affairs paved the way for the establishment of new hospitals. In 1864, an agreement was signed by 16 countries declaring the treatment area of wounded soldiers and civilian hospitals as neutral territory.

Another reason why the nineteenth century is the keystone of the hospital history is the role of Florence Nightingale. Hygiene was Nightingale's the most primary principle. Thanks to factors that were not common at that time, such as intervention in the clean zone, institutional treatment improved and nursing services began in more professional manner.
Miss Nightingale began her nursing training in Germany in 1836 and wrote about the lack of hygiene in hospitals in Germany. When she returned back to England, she did not leave these ideas in theory but put them into practice. In 1854, the British Government assigned her to the rehabilitation of needy soldiers during the Crimean War. By controlling the hygiene of laundry, kitchen and other related spaces in the zone, she succeeded to reduce the mortality rate excellently within 10 days.

Upon her return to England, Nightingale established the first nursing school in 1860 for nurses in St. Thomas' Hospital in London that mentioned in Renaissance period as one of The hospital that has been kept its existence. In 1863, the inaugural group of 15 nurses graduated from the school, contributing to the advancement of nursing education. The developments in the nineteenth century did not end there, discoveries made by scientists continued and it was discovered that bacteria were the cause of disease. Before this invention, physicians suggested that another factor in eliminating infections was clean drinking water. Providing optimal drinking water and dispersing inferior odors was considered an important element in preventing the occurrence of epidemics.



(Fig.8): Lithograph of Florence Nightingale in one of the renovated wards in the hospital at Scutari (Turkey) during the Crimean War
Beatriz Colomina and Mark Wigley, "The Bacterial Clients of Modern Architecture," (2020), 11.



(Fig.9): St. Thomas' Hospital at Nightingale's time, the 'new hospital' across the Thames from the Houses of Parliament.
https://87414007.weebly.com/florence-nightingale-school-of-nursing-and-midwifery.html

It was *"the first secular nursing school in the world, and the only one to have been funded solely by private donations to an individual,"* states academican Lynn McDonald. Now located at the King's College in London, this school provided opportunities for women to become nurses and was the foundation for all professional nursing careers.

Besides the health improvements experienced due to the war, another step taken in line with the modernization ideology of the nineteenth century was the work of Ignaz Semmelweis, who collected and analyzed clinical care data in Vienna to prove the contagious nature of postpartum infections. For Semmelweis, the main factor in health care was hygiene, as Miss Nightingale.

By requiring doctors and students under his charge to rub their hands with soap and water and dip them in chlorinated lime solution before entering the clinic or ward, and to repeat this after each examination, he reduced the obstetric mortality rate amazingly within 3 months.

Louis Pasteur, based on his hygiene studies, scientifically; he demonstrated that bacteria were increased their amount through reproduction but not form spontaneously, as assumed earlier. Joseph Lister carried on Pasteur's work, and Lister observed that defeated bones often healed without any complications and the same infection occurred during other surgeries as well. As a result, he confirmed that some cells in the body are particularly responsible for infections.

In the 1870s, Germany paid attention to the studies proven by Lister, and both doctors and patients were provided with carbolic solution for hygiene before surgeries in operating rooms. Thus, surgeries began to be performed in a sterile environment without worrying about infection. Various inventions followed one another in the 19th century. After all these studies, with the discovery of anesthesia and steam sterilization, surgical modernity was one step closer to modernization, the use of anesthesia and steam sterilization in surgeries increased.

Up to this point, three discoveries (detection that bacteria are the cause of diseases, anesthesia and steam sterilization) have enabled the development of modern hospitals. Later, in 1895, with the discovery of the x-ray by Wilhelm Konrad Roentgen, the foundations of the modern hospital were completed.

Hospitals are no longer structures where the sick and homeless take shelter, or where the church has the right to speak, as in previous centuries; they have become special structures through which patients can be diagnosed and intervened with the help of inventions and science. From another perspective, the cost of hospital care has increased significantly.

The next consistent step in the development of medicine was specialization. In the late nineteenth and early twentieth centuries, specialties and subspecialties were differentiated according to departments of medicine or surgery. After all, every described inventions and events led to the construction of many hospitals not only Europe but also around the world. By the late nineteenth century, 149 hospitals with a total bed capacity of 35,500 were established in the United States.

Another argument about modern hospitals was about the interaction of hospital design with patients. Not only architects, but also nurses and doctors produced thoughts on this subject and examined the design-patient relationship. This idea was actually examined in the book written by Florence Nightingale, "*Notes on Hospitals",* (1885). According to Nightingale, the environment had both a physical and psychological effect on patients. She also thought that form, color, light and every other detail, including interior design and furnishings, could have an impact on the patient.

Although all of these have been considered in the modern age, their implementation is due to various reasons; economic anxiety, like comforting or inspiring, was not sufficiently possible. But there were exceptions that went beyond this cycle that was designed by taking into consideration the patient's needs, terracing designs, natural lights and nature views, and various relaxing factors that may have an effect on healing. Richard Döcker Waiblingen Sanatorium 1928, Lubetkin's health center in Finsbury London, and particularly Aalto's sanatorium at Paimio, Finland that are inspiration samples for this era. These designs were designed by not only considering the psychology of sick but also aimed to healing particular illnesses.

Participants: Armies, Veterans Affairs, Dr. Nathan Smith Davis, Florence Nightingale, Ignaz Semmelweis Louis Pasteur, Joseph Lister, Wilhelm Konrad Roentgen

Case Study: American Medical Association, Nightingale first school, Richard Döcker Waiblingen Sanatorium , Lubetkin's health center in Finsbury London Aalto's sanatorium

2.6) CONTEMPORARY AGE

The explanation of contemporary hospital is a healthcare building that has the capacity to meet the care needs of patients as well as being equipped technology to provide clinical training and to medical students, nurses and also other healthcare professionals. One of the basic obligations of the contemporary hospital is; in addition to being educational, it also provides fundamental research in the fields of physics and chemistry that can contribute to medical science.

The most important distinction of the modern era from the past is that the popular notion of units in the mid-nineteenth century is no longer allowed, and therefore hospitals today mostly have semi-private and private rooms. Regardless of private or public hospitals, four-bed rooms are now rarely used. Today, the ''manufacturing'' of the hospitals are be regulated and supervised by various institutions such as; federal laws, state health department regulations, city ordinances, the standards of the healthcare organizations, and other safety codes (building, fire protection, sanitation, etc.). The purpose of these requirements is to ensure that patients to protect privacy rights; safety and well-being of patients and staff, and

authority of spreading the infection one to other either directly or indirectly. Nevertheless, the speedy growth of non-hospital and self sufficient care facilities are leading to competition between health care facilities. Many health centers that could not reach an economically sufficient amount are closing, and the expansion of health centers are slowing down towards the end of the 1980s. Yet, the idea of private treatment continuing to be implemented and hospitals have become just one part among all of large healthcare systems. Since then, hospitals are no longer the only place for medical care but it branched out into many fields, also provided more healthcare rehabilitations that works for a particular illness.

Hospitals began to open according to various concepts. While some hospitals addressed specific age groups, such as Meyer's Children's Hospital in Florence, Italy which gives the enormously importance to natural lightening and elements, sky and cloud paintings that designed for children; some hospitals targeted specific diseases. Centre for Cancer and Health in Copenhagen Denmark; is one of the example that designed for the specific illness with its different perspective design rather than traditional architecture. Designed to provide a hospital environment that feels like home, aiming to contribute to both physical and mental healing by focusing on the mental health of patients as well as treating cancer.
Instead Graz West State Hospital in Graz, Austria is the hospital that concepted by its own design rather than illness, age, gender etc. An example of a contemporary-age hospital designed with what is best for patients in mind. The the idea of the hospital is mainly about creating "a street" within a hospital in order to emphasize "the sense of access", a clear circulation space and defined boundaries. Another point is creating a "gallery" inside of the hospital for creating inside and outside relationship for patients and allows them to feel daylight and landcape.

(Fig.10): Provincial Hospital Graz-West Domenig/Eisenköck/Gruber welcome daylight and fresh air into a public hospital with an upscale feel in a spectacular landscape https://www.architecturalrecord.com/articles/12145-provincial-hospital-graz-west

Case Study: Graz West State Hospital in Graz Austria, Meyer's Children's Hospital in Florence Italy, Centre for Cancer and Health in Copenhagen Denmark

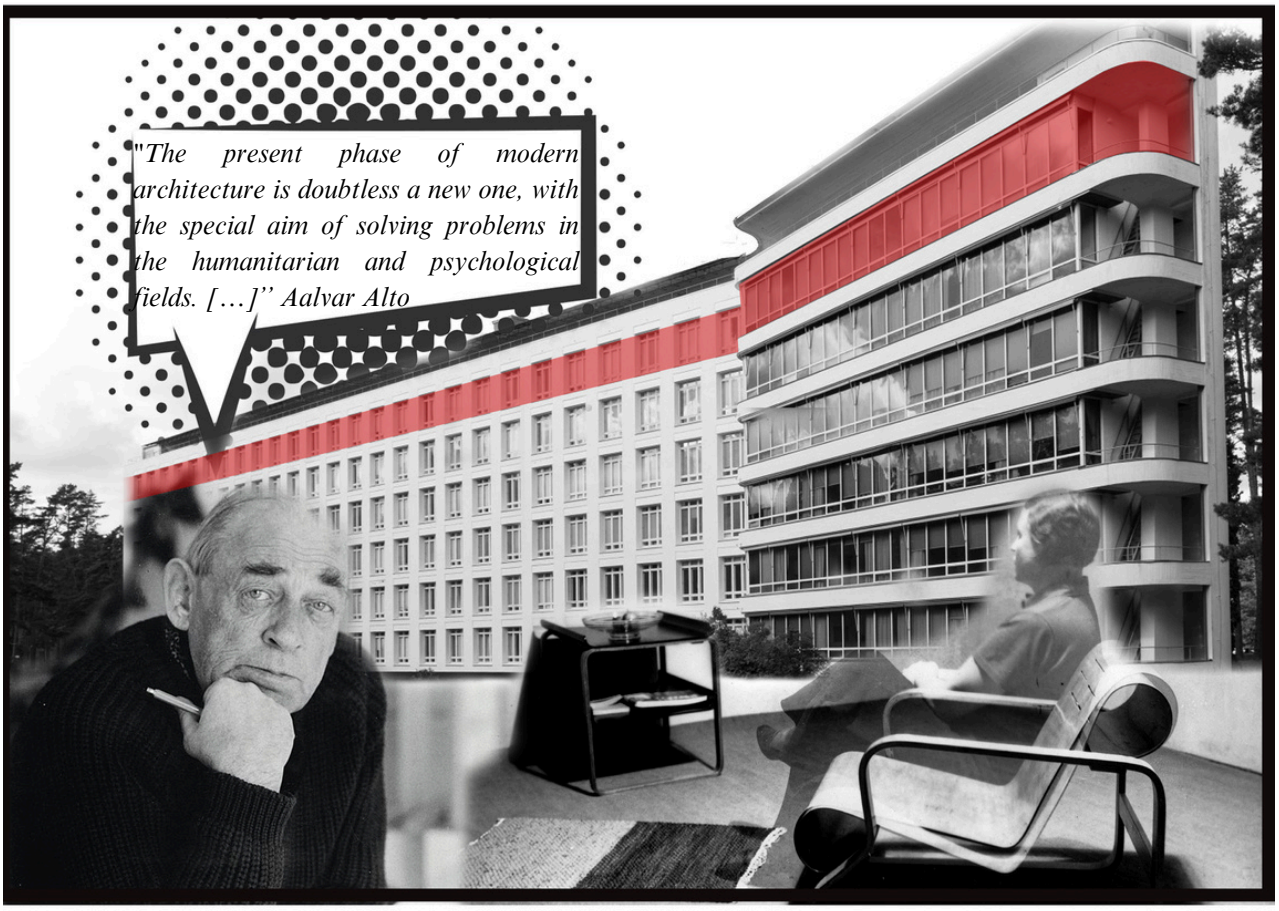
Yet, the argument is; with today's technology and high level of education, how much do we see these ‘’humanizing hospitalization’’ in our society? Do we really understand architecturally the hospital evolution from the past to now, do we exanimate enough our roles and its power in order to accelerate the healing process? Or letting individuals with the capacity to establish hospital institutions prioritize their own interests over the health conditions of patients? Are we forgetting the architectural masterpieces of the past that has already helped to speed up healing? How much of the psychological and architectural elements that Nightingale -as a nurse- discussed years ago for their potential impact on the recovery process, are we incorporating into hospital designs today as architects? Why have we not managed to further popularize Aalto's modern ideas that he designed in 20st century into today 21st century?

Today in hospital architecture, creative ideas and solution-oriented structures that benefit humanity is essential. Healthcare buildings, especially in such a crucial field of health, should fundamentally prioritize the needs of patients and aimed to accelerate the healing of their the illness both physically and mentally, embodying the essence of contemporary architectural principles.

Overall, the evolution of healthcare architecture reflects humanity’s centuries of medical advances, cultural changes, and technological breakthroughs. From the spiritual and primitive healing spaces of ancient times to the sophisticated and human-centered designs of contemporary hospitals, hospital architecture has been fundamentally transformed and adapted. From the spiritual asclepiades of ancient Greece to the personalized, from the understanding of public to personalized care, therapeutic environments of modern healthcare facilities, each period has changed the way spaces heal and support individuals, thanks to the pioneering efforts of their participants. Key milestones such as Florence Nightingale’s integration of hygiene principles, the rationalist approaches of the Renaissance, and today’s high-tech yet human-centered designs have continually evolved to balance scientific innovation with the emotional and physical needs of patients. Modern hospitals not only provide spaces for treatment, they also aim to foster mental well-being by using design elements such as natural light, bioclimatic structures, and user-friendly environments to facilitate healing.
The key to reconciling the economic, ethical, and creative dimensions of hospital architecture to this day is to reconcile them. Incorporating lessons from historical successes and ensuring that healing environments prioritize the holistic well-being of patients must remain at the core of healthcare design. The future of hospital architecture requires a vision that embraces innovation while adhering to the principle of “serving humanity.”

2.7) CASE STUDIES

2.7.1) Alvar Aalto, PAIMIO SANATORIUM



Collage by Nilay Yasar

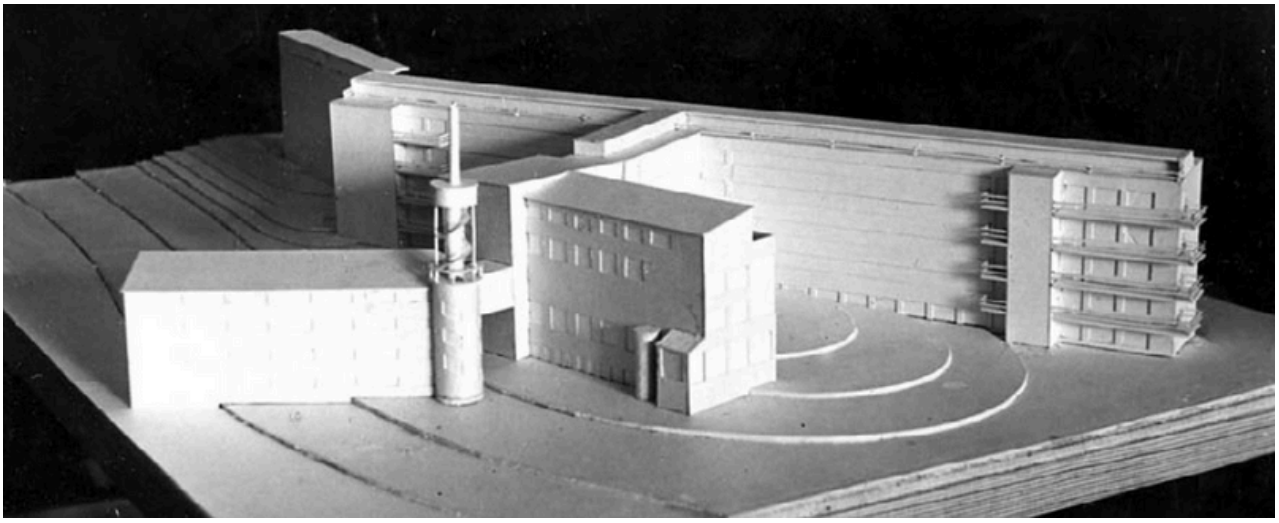
Alvar Aalto pioneered innovative architecture in his seminal work, the Paimio Sanatorium, constructed in a ~14,000 m² greenery area that is located in Paimo, Southwestern Finland and designed in Modern Age between 1928 and 1933. During these period, Aalto was in continuous communication with CIAM. (International Congresses of Modern Architecture)
He became a representative for the global technical design approach in Finland. Aalto succeeded in establishing himself as an expert in contemporary architecture. He contended that "rational methods" must be expanded to include humanitarian and psychological domains.Aalto demonstrated his concept using the examples of the Paimio Tuberculosis Sanatorium.

The hospital is situated in a pine forest with scattered residences and fields. This location still offers its current users a peaceful environment surrounded by natural beauty and was considered the most suitable site for the building's original function, a tuberculosis sanatorium. The hospital complex includes: the main sanatorium building, the head physician's residence (now a kindergarten), the junior physicians' row house, the staff residence (now offices), the hospital morgue, technical rooms.

All completed in 1933; the nurses' row house and the garage, built in the 1960s; and the heating plant, built in the 1980s. Aalto also designed a path connecting a series of water fountains in an area south of the main building, providing a natural environment for patients to walk in.

Aalvar Alto Sanatorium area
Paimo Sanatorium Conservation Management Plan, Alvar Aalto Foundation, 2016, 16-17

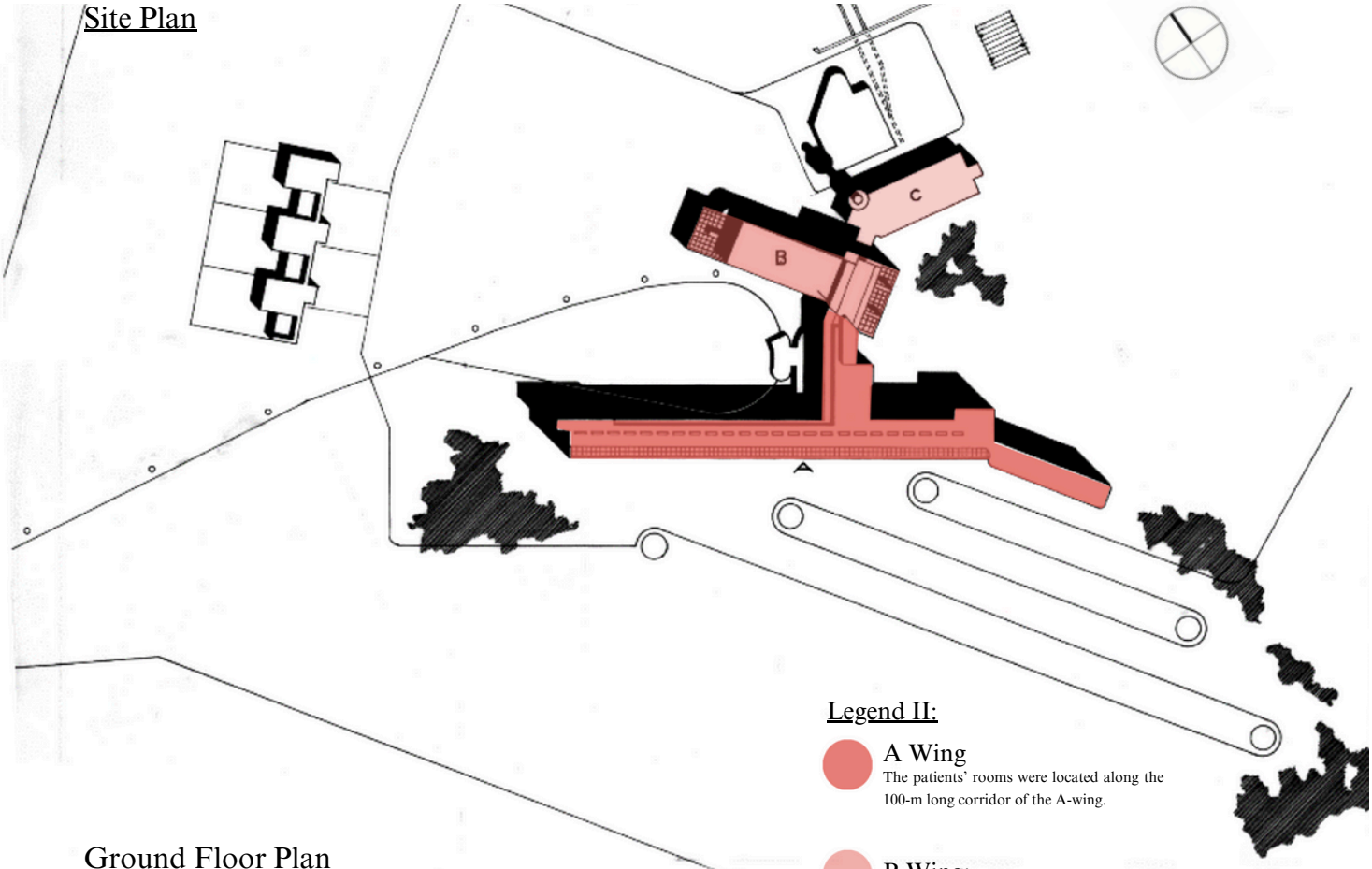
1934: The path with the fountains is completed. Some birches are left next to the walk path. At the east end of the garden the end of the grass lawn is seen.
Paimo Sanatorium Conservation Management Plan, Alvar Aalto Foundation, 2016, 195



Model of Aalto's competition winning entry
Paimo Sanatorium Conservation Management Plan, Alvar Aalto Foundation, 2016, 54

Paimo Sanatorium Conservation Management Plan, Alvar Aalto Foundation, 2016, 18.
Edited by Nilay Yasar

Site Plan



Legend II:

A Wing
The patients' rooms were located along the 100-m long corridor of the A-wing.

B Wing:
The B-wing housed mostly common functions such as the dining hall and the doctors' reception area.

C Wing
The top C-wing was a serving wing with a kitchen and a staff dormitory.

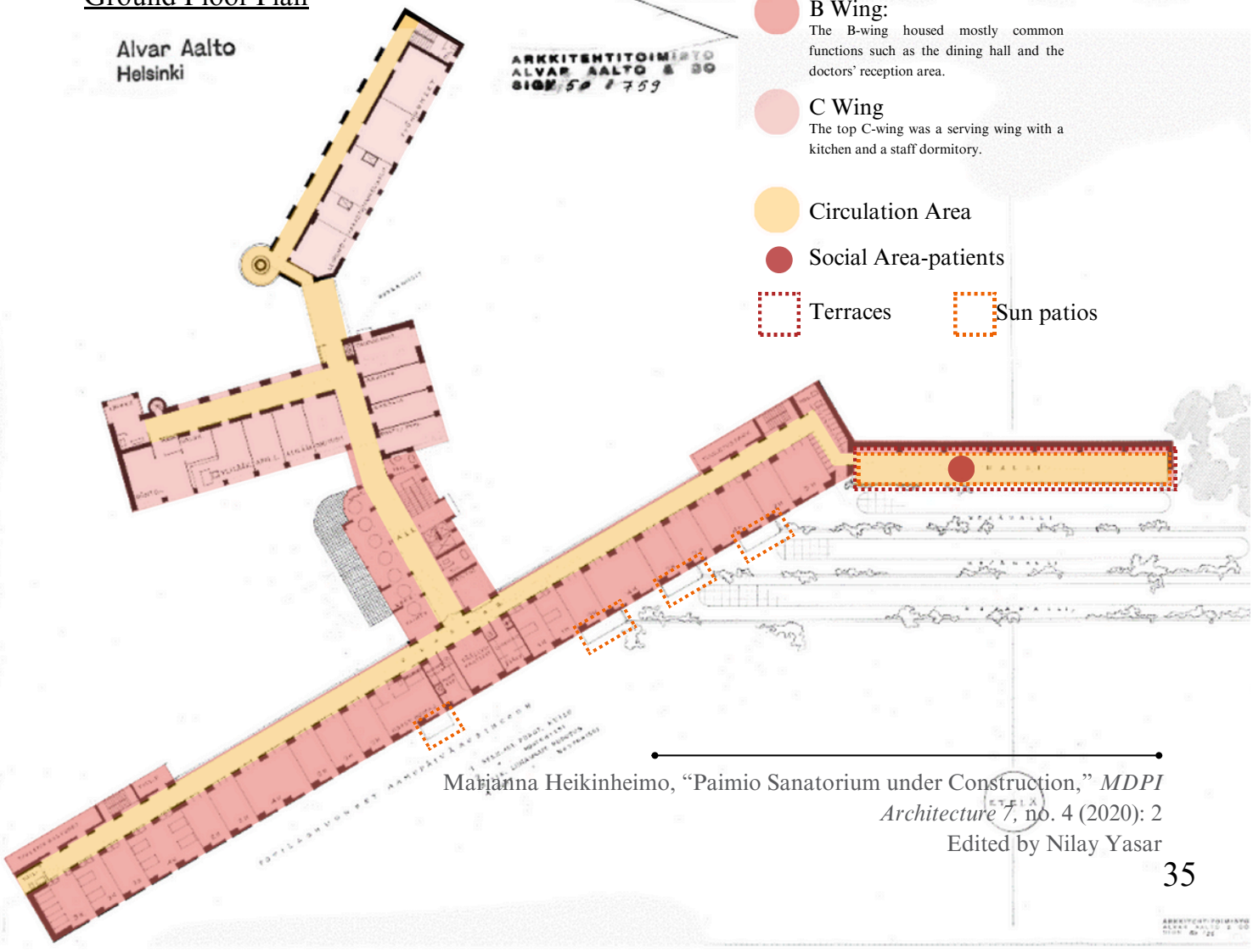
Circulation Area

Social Area-patients

Terraces

Sun patios

Ground Floor Plan

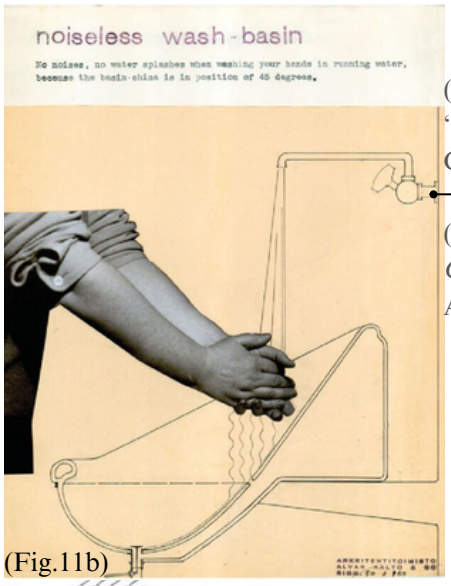


Marjanna Heikinheimo, "Paimio Sanatorium under Construction," *MDPI Architecture 7*, no. 4 (2020): 2
Edited by Nilay Yasar

Aalto concentrates on the connection between an individual patient and their room, specifically exploring the patient's behavioral and psychological aspects within the existential environment. Especially, what is also particularly interesting for me as well is, he thought about the ‘’body direction’’. To be mor clear as human being, we are ‘’vertical’’ but under the health conditions, human being is ‘’horizontal’’. Even though Aalto described being horizontal understanding for tuberculosis, actually spinal injury and/or paralyzed struggles are even more horizontal that they can not even move their neck with the health equipment and neck collar. Thus, he considered the perspective of the bedridden patient in terms of color, lighting, heating, noise, etc.. Some design of Aalto is given below;

- The ceiling should be painted in a darker color, chosen carefully to be a pleasant view for the patient lying down for a long time. (Fig.11a)
- Each patient in two-patient rooms had their own washbasin, designed so water flows quietly by hitting the basin at a small angle and makes it ‘’noiseless basin’’. (Fig.11b)
- Ceiling radiators were used for heating, with heat directed towards the foot of the bed to keep the patient's head out of the direct heat. (Fig.12)
- In the patient rooms, the main light source should not come from a regular ceiling fixture but should be placed where the patient cannot see it directly. The windows and doors were positioned to suit the patient's view and comfort. Also in public spaces, natural light is still crucial and designed a linear window for maximizing the brightness of the light in the halls. (Fig.13a,b)
- One wall in the room was made to absorb sound to keep the noise level low.

(Fig.11a)

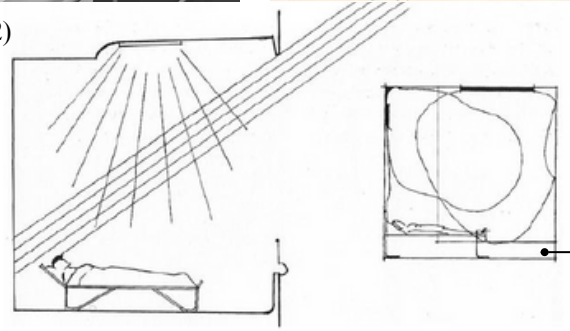


(Fig.11b)

(Fig.11a): Marianna Heikinheimo, “Paimio Sanatorium under Construction,” *Arts 7,* no. 4 (2020): 10

(Fig.11b): *Paimio Sanatorium Conservation Management Plan,* Alvar Aalto Foundation, 2016, 150

(Fig.12)



Living with Buildings: Design for Health, exhibition catalogue (London: Wellcome Collection, October 2018), 4

(Fig.13a): Patients' room windowsMatt Shaw, "What Is the Future of Aalto's Landmark Paimio Sanatorium?" *Architectural Record,* March 20, 2024

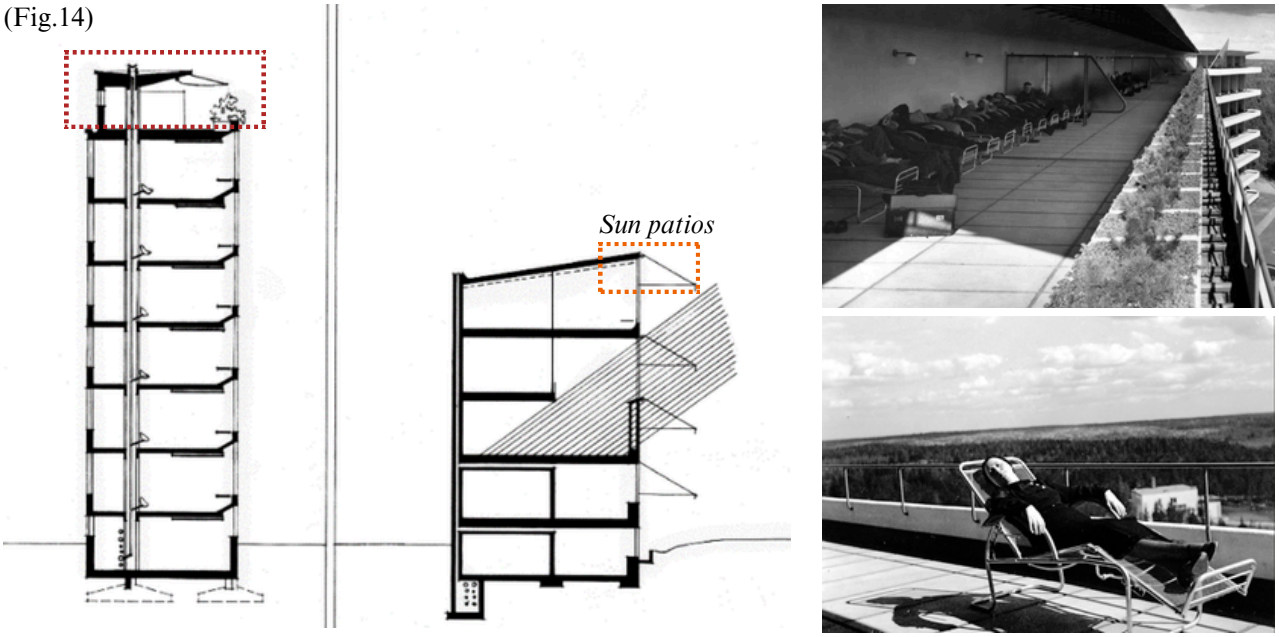
(Fig. 13b):*Paimio Sanatorium Conservation Management Plan,* Alvar Aalto Foundation, 2016, 150.

- https://divisare.com/projects/386217-alvar-aalto-fabrice-fouillet-paimio-sanatorium

The patient room windows were crucial and noticeable part of the sanatorium for the legislator. The patient room window design was completely changed from a steel window to a mix of wood and metal. The floor-reaching design also allowed for lots of daylight, helping the patient. Custom-made steel windows manufactured in Finland from imported profiles were too expensive. Aalto created a new type of wooden window that used some steel profiles.

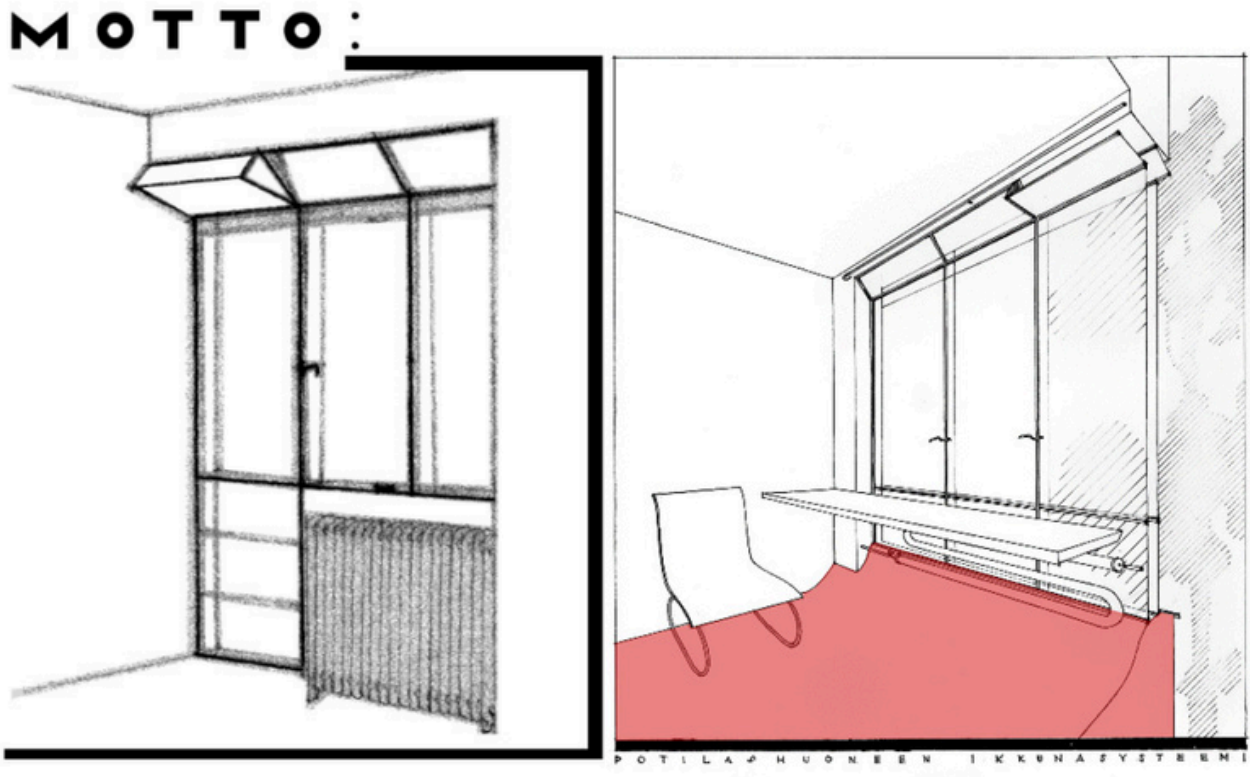
The window was somewhat similar to a traditional ventilation window, known as the "health window," but this time it was horizontal. The medical experts of the sanatorium project preferred health windows, which architects had used in schools, hospitals, and other public buildings since the mid-19th century. By using this idea and calling his window a "health window," Aalto managed to gain the approval of medical experts. Doctors had requested that the steel windows not reach the floor for hygiene reasons. He changed the shape of the floor so that it curved upwards.This solution met the doctors' hygiene standards, and the architect could keep some important design features.

(Fig.14)



(Fig.14): The sun pation technique, which prevents sunlight from reaching the hospital room directly, and the treatment terrace areas of the sanatorium

- Marianna Heikinheimo, "Paimio Sanatorium under Construction," *Arts 7,* no. 4 (2020): 6
- *Paimio Sanatorium Conservation Management Plan,* Alvar Aalto Foundation, 2016
- Katie Underwood, "Saving Alvar Aalto's Paimio Sanatorium: This Finnish Landmark, Significant in Both Architectural and Medical History, Gets a New Lease on Life," *Azure Magazine,* September 12, 2016, https://www.azuremagazine.com/article/saving-alvar-aalto-paimio-sanatorium/.

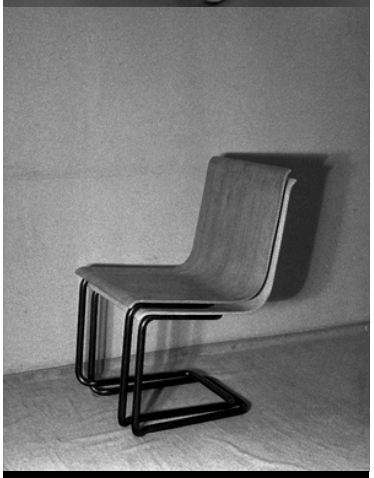


(Fig.15): One step later in the design process, the drawings shows that the bottom edge of the window section was in the floor level that shaped as curve upwards in order to create optimum hygiene level

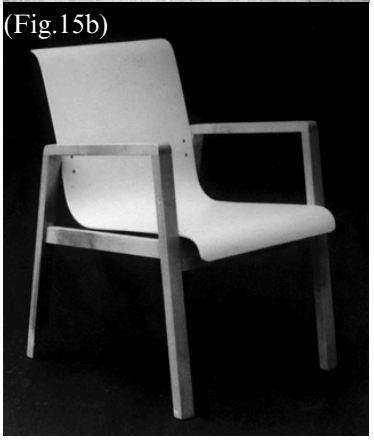
- *Marianna Heikinheimo, "Paimio Sanatorium under Construction," Arts 7*, no. 4 (2020): 7
- Edited by Nilay Yasar

The idea of a “minimum apartment” motivated Aalto to examine the needs of the patients in this hospital project. Aalto’s design was socially more innovative than other Finnish hospitals constructed in the same timeframe and his inventive solutions fostered a sense of uniqueness. In the small room for two patients, efficient design solutions were essential. Aalto optimized the available space through design: he used multifunctional items like the bedside lamps and objects that intersected spatially and folded, such as the bedside table. Essentially, he addressed the small living area as an integrated issue. Additionally, Aalto's underlying plan was to launch his furniture into mass production.

(Fig.15a)

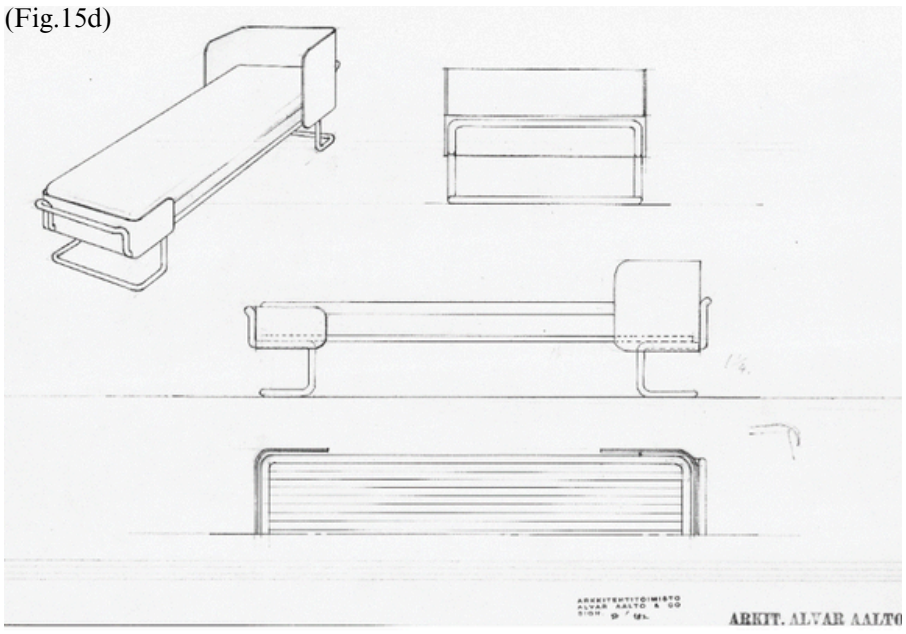


(Fig.15b)



(Fig.15c)

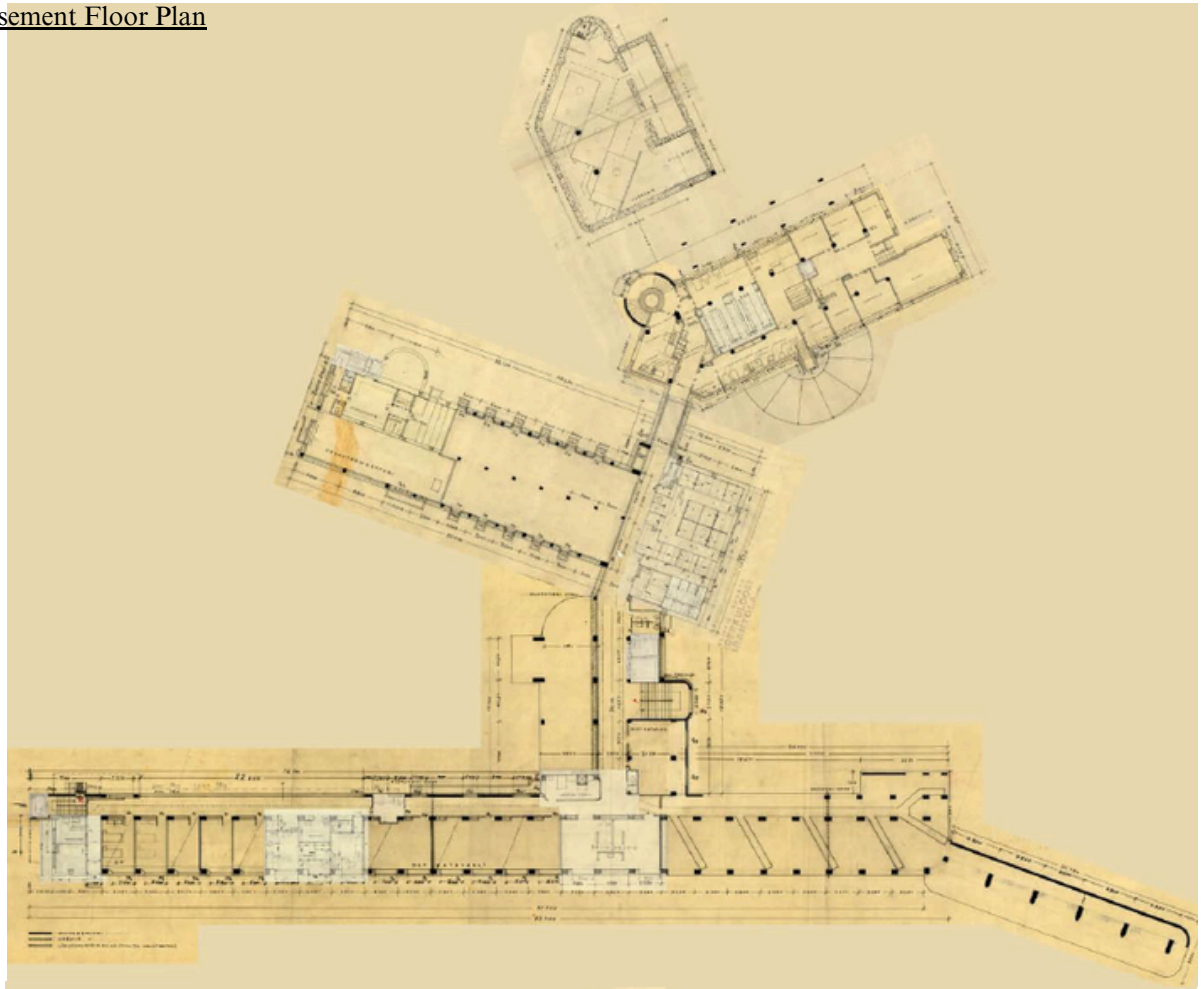
(Fig.15d)



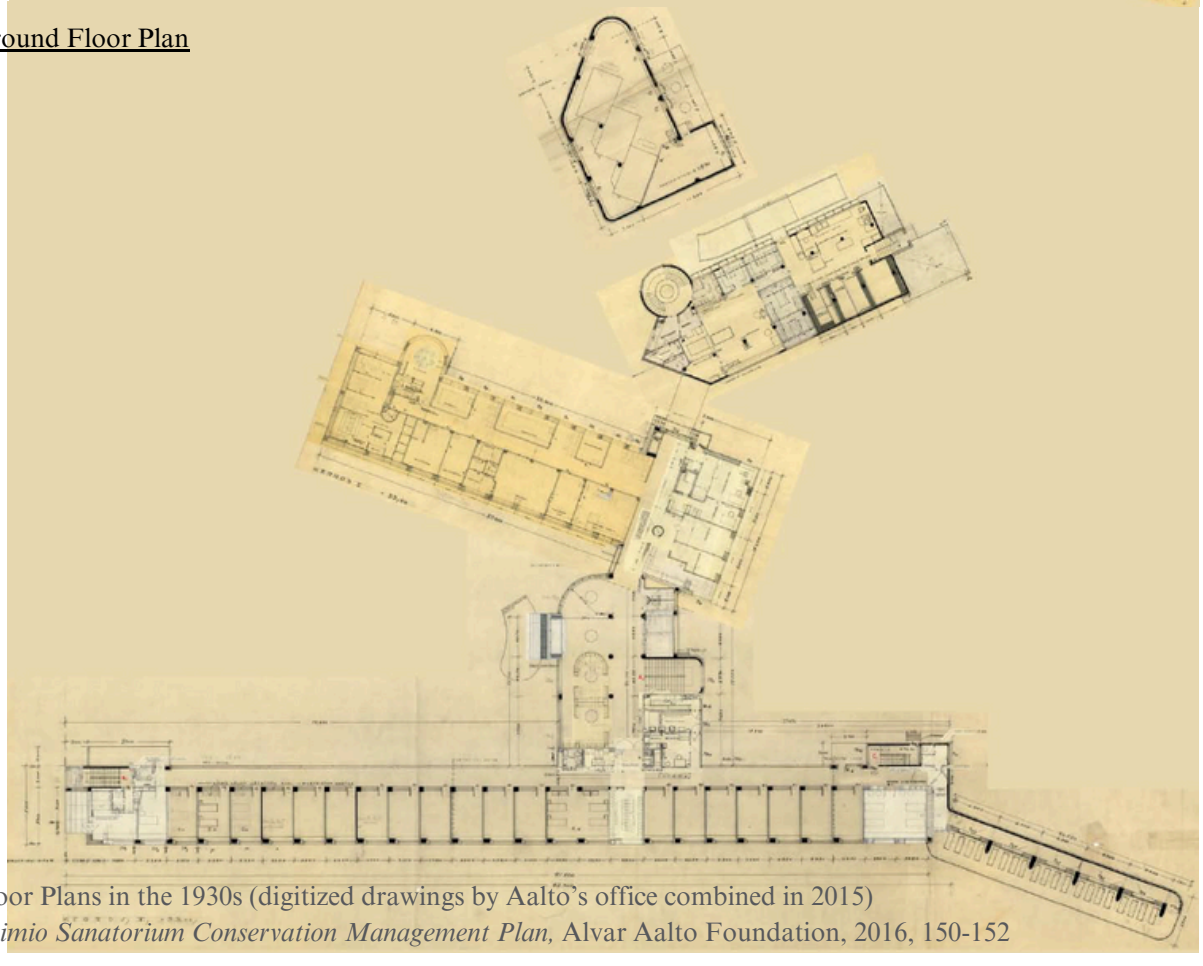
(Fig.15): Shows furniture designs of Aalto:
a)bedside table that is movable,b)mass production modernist chairs, c)hidden wardrobe and fixed chair of hospital room, d)more nuanced bed design

Marianna Heikinheimo, “Paimio Sanatorium under Construction,” *Arts 7*, no. 4 (2020): 10-13

Basement Floor Plan

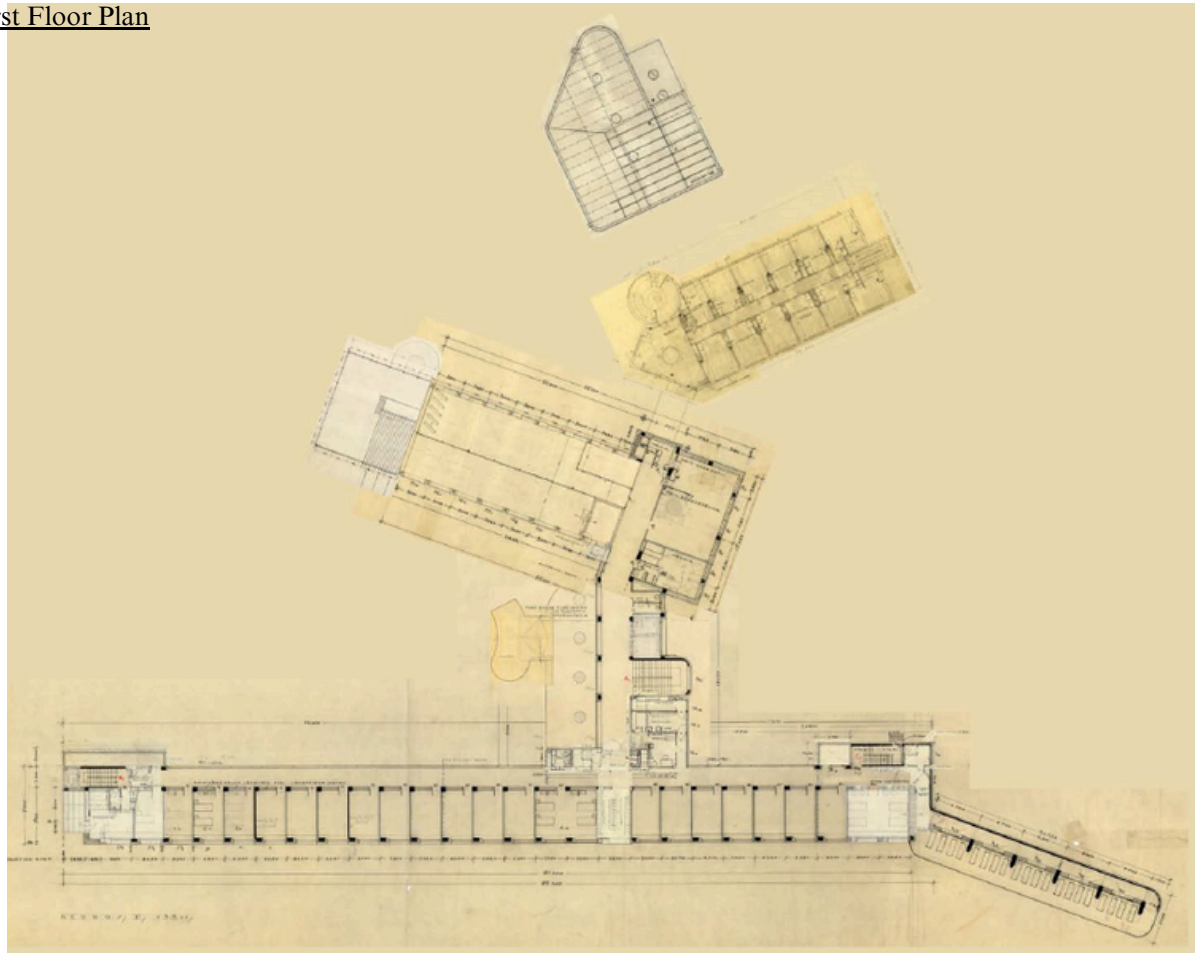


Ground Floor Plan

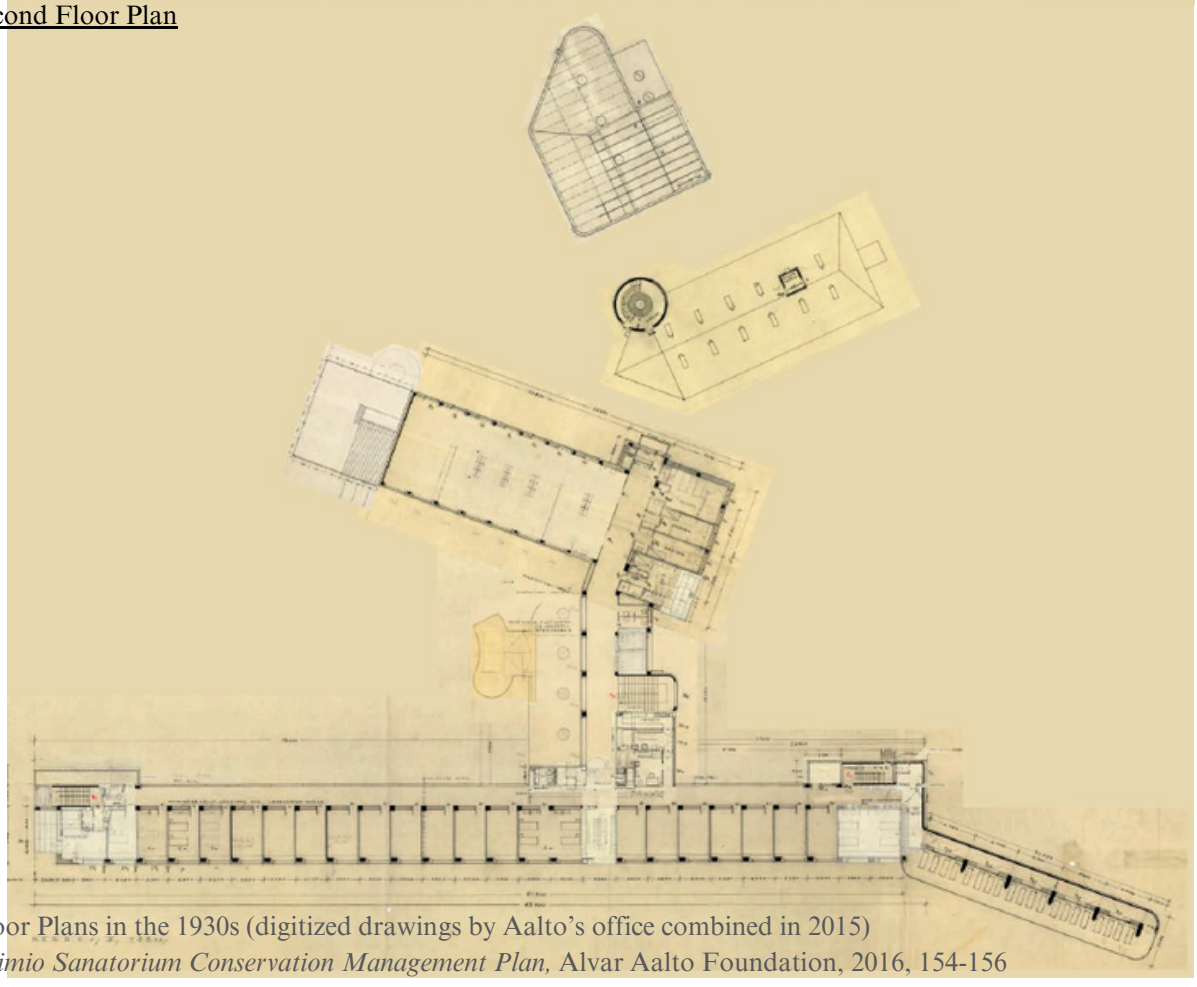


Floor Plans in the 1930s (digitized drawings by Aalto's office combined in 2015)
Paimio Sanatorium Conservation Management Plan, Alvar Aalto Foundation, 2016, 150-152

First Floor Plan

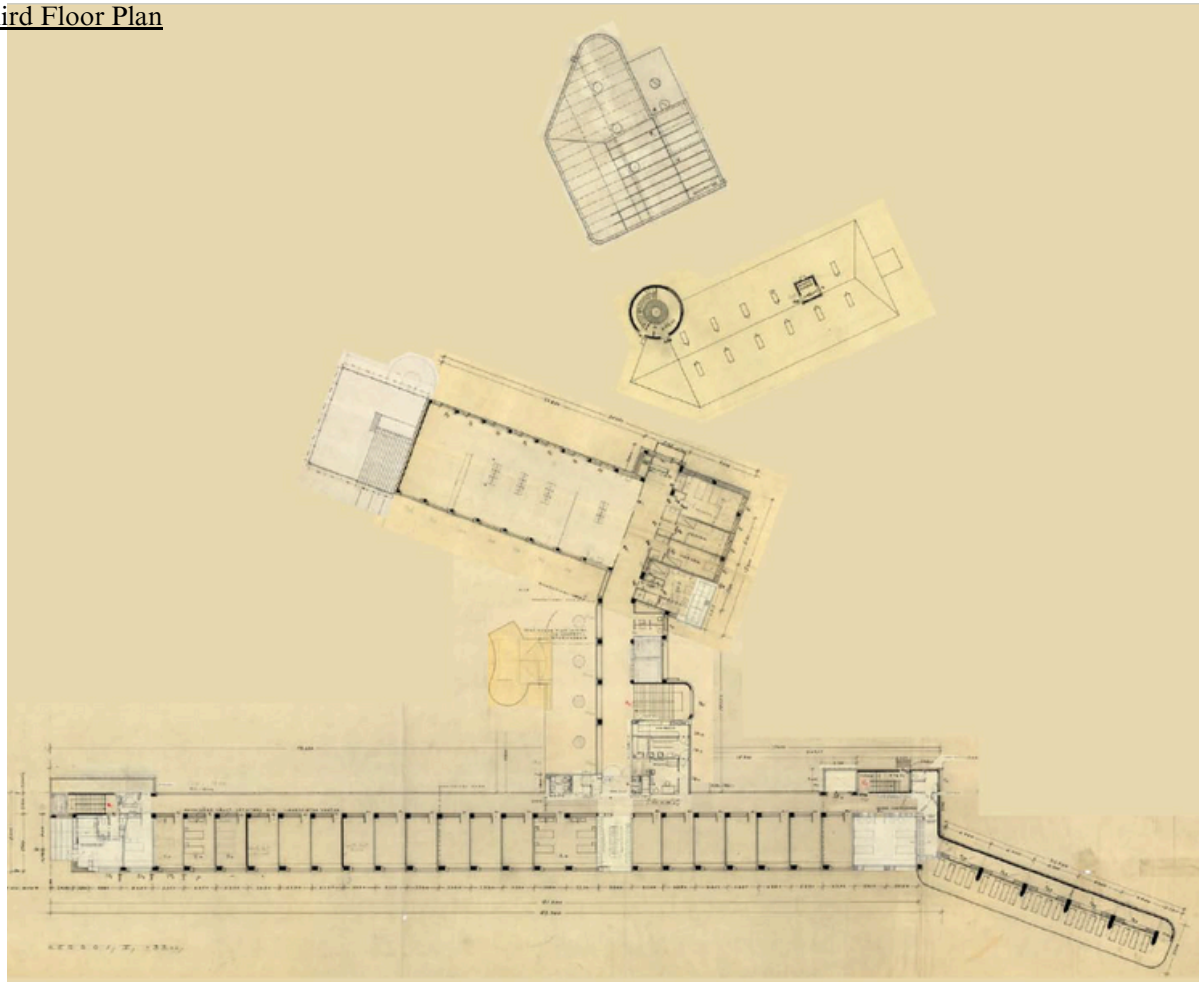


Second Floor Plan

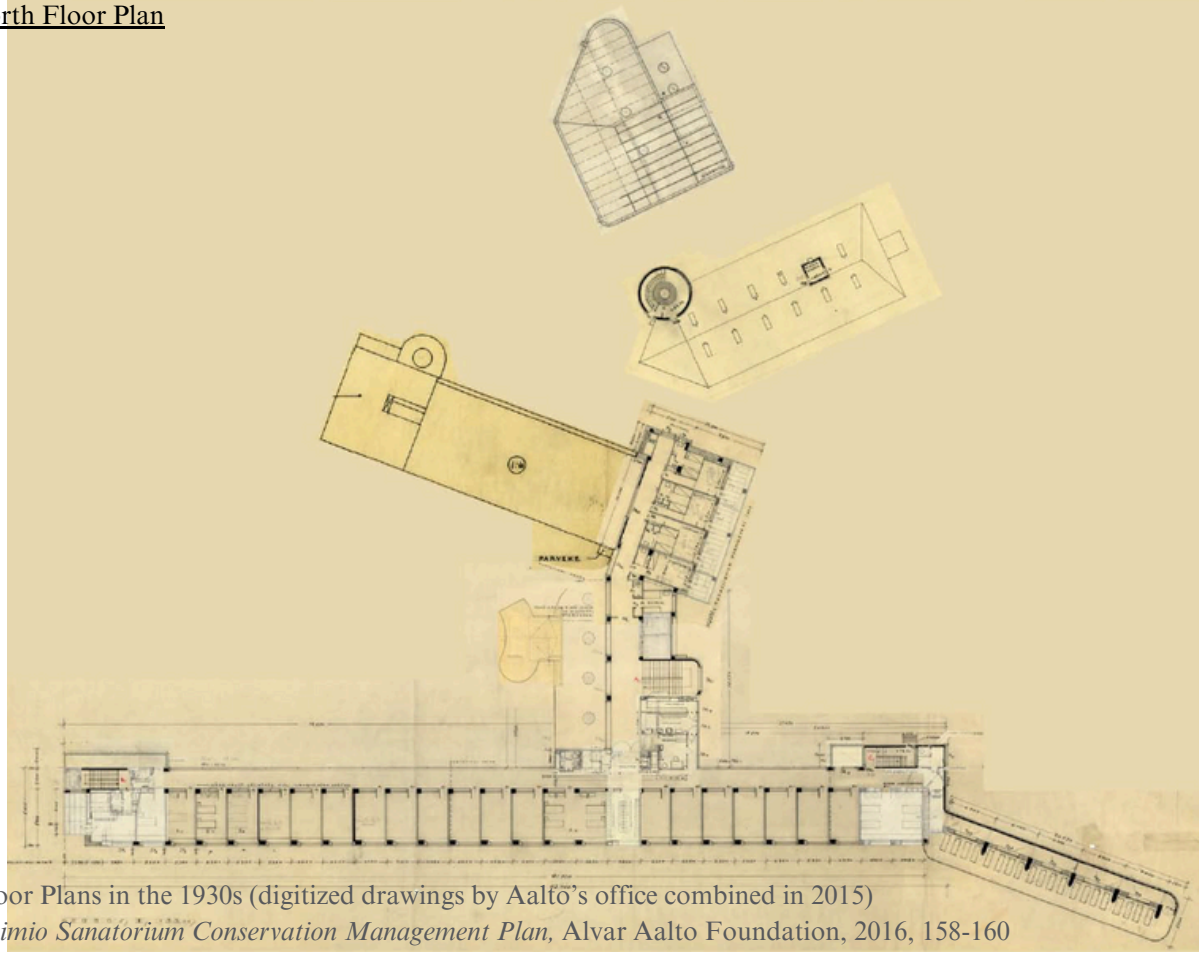


Floor Plans in the 1930s (digitized drawings by Aalto's office combined in 2015)
Paimio Sanatorium Conservation Management Plan, Alvar Aalto Foundation, 2016, 154-156

Third Floor Plan

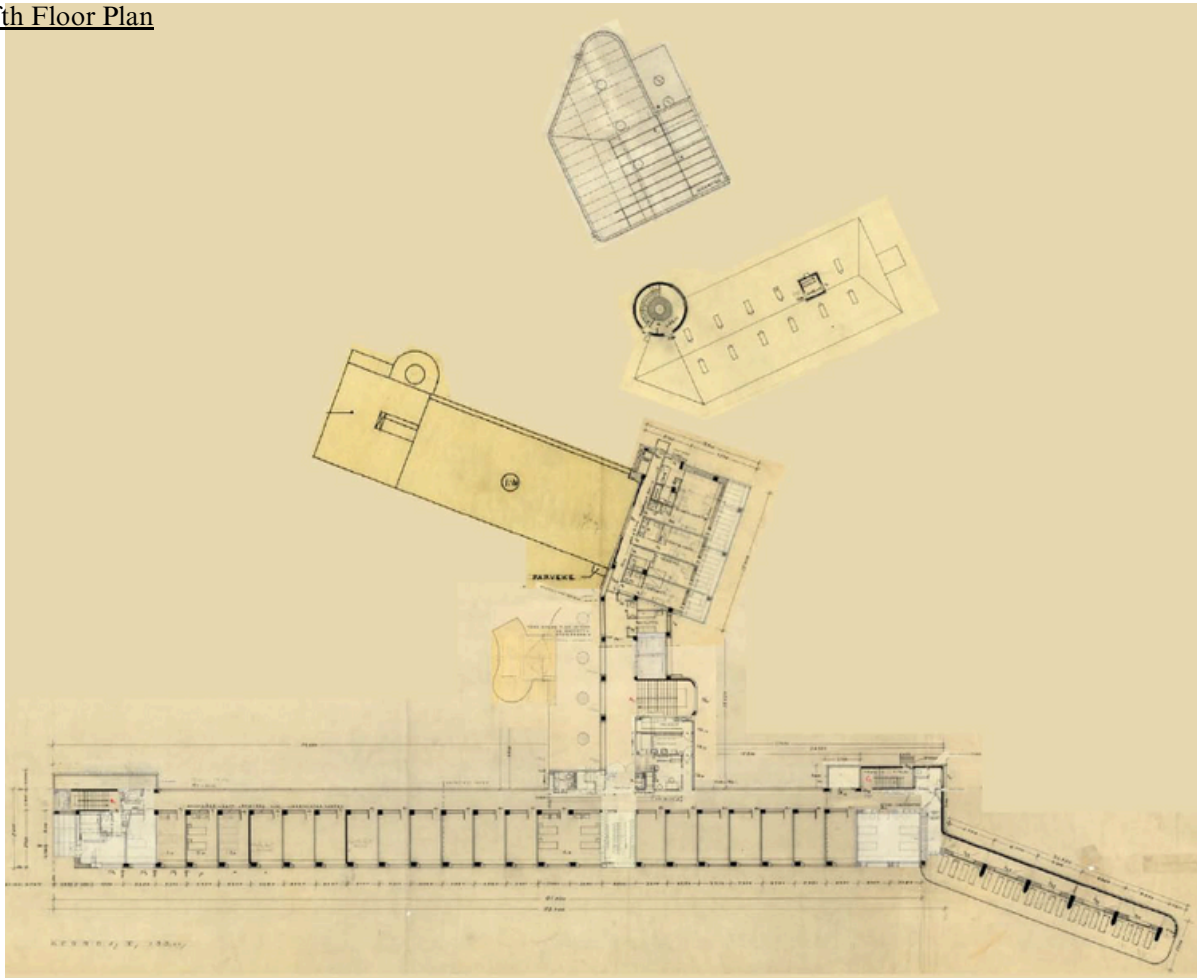


Forth Floor Plan

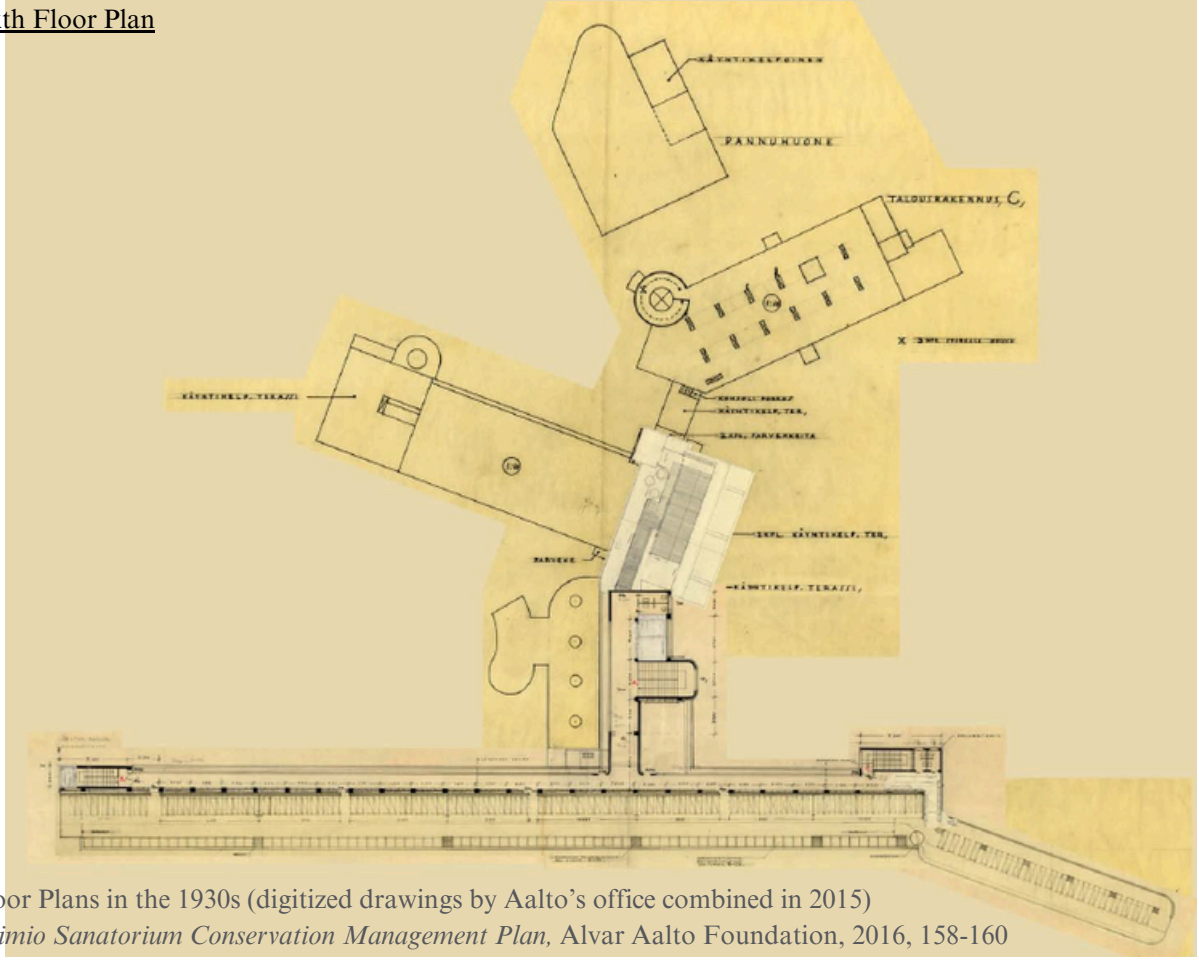


Floor Plans in the 1930s (digitized drawings by Aalto's office combined in 2015)
Paimio Sanatorium Conservation Management Plan, Alvar Aalto Foundation, 2016, 158-160

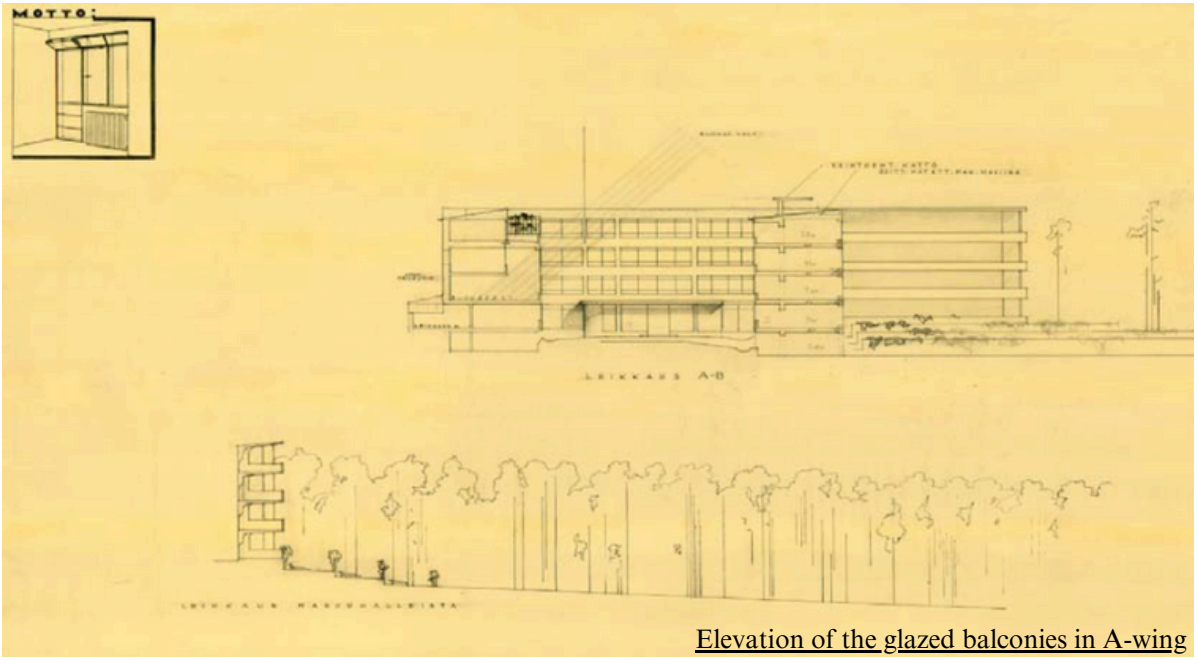
Fifth Floor Plan



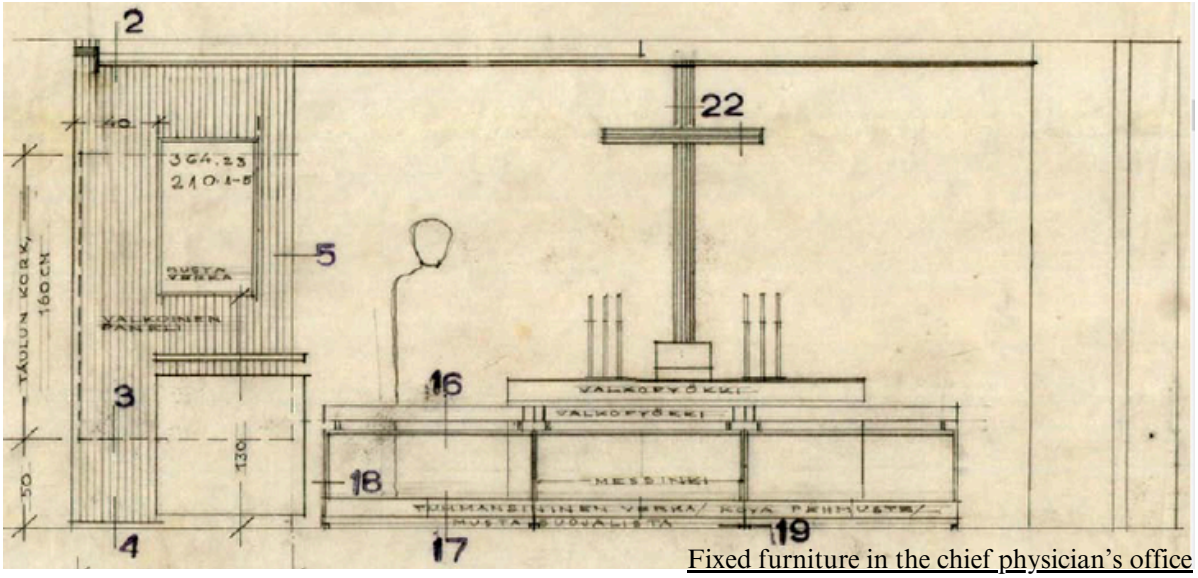
Sixth Floor Plan



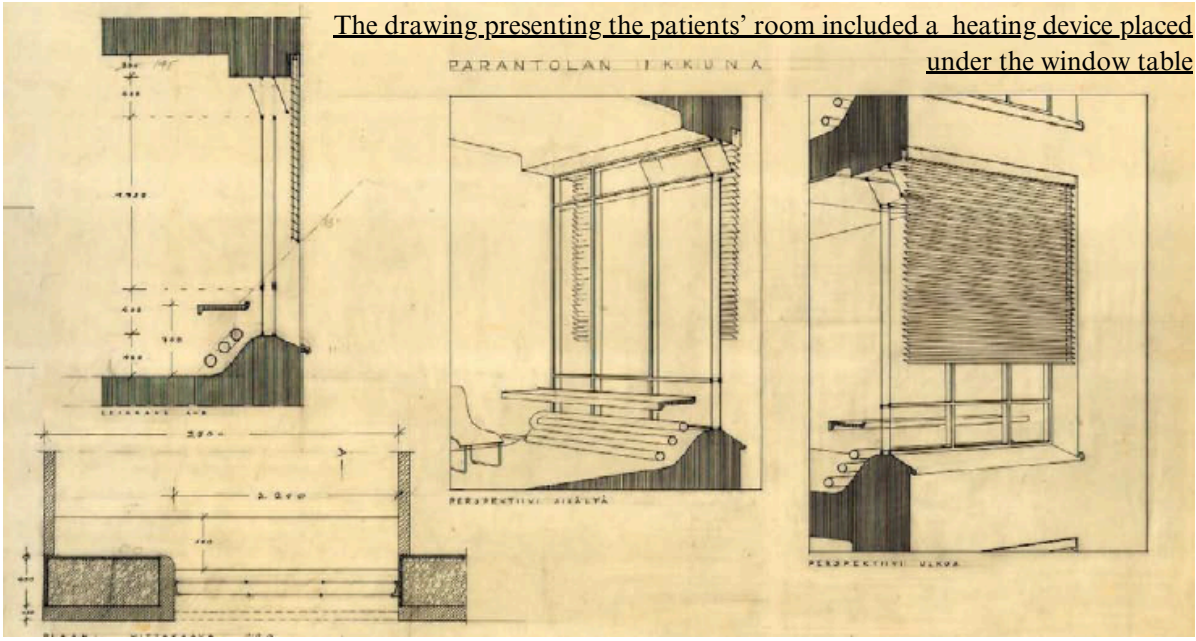
Floor Plans in the 1930s (digitized drawings by Aalto's office combined in 2015)
Paimio Sanatorium Conservation Management Plan, Alvar Aalto Foundation, 2016, 158-160



Elevation of the glazed balconies in A-wing



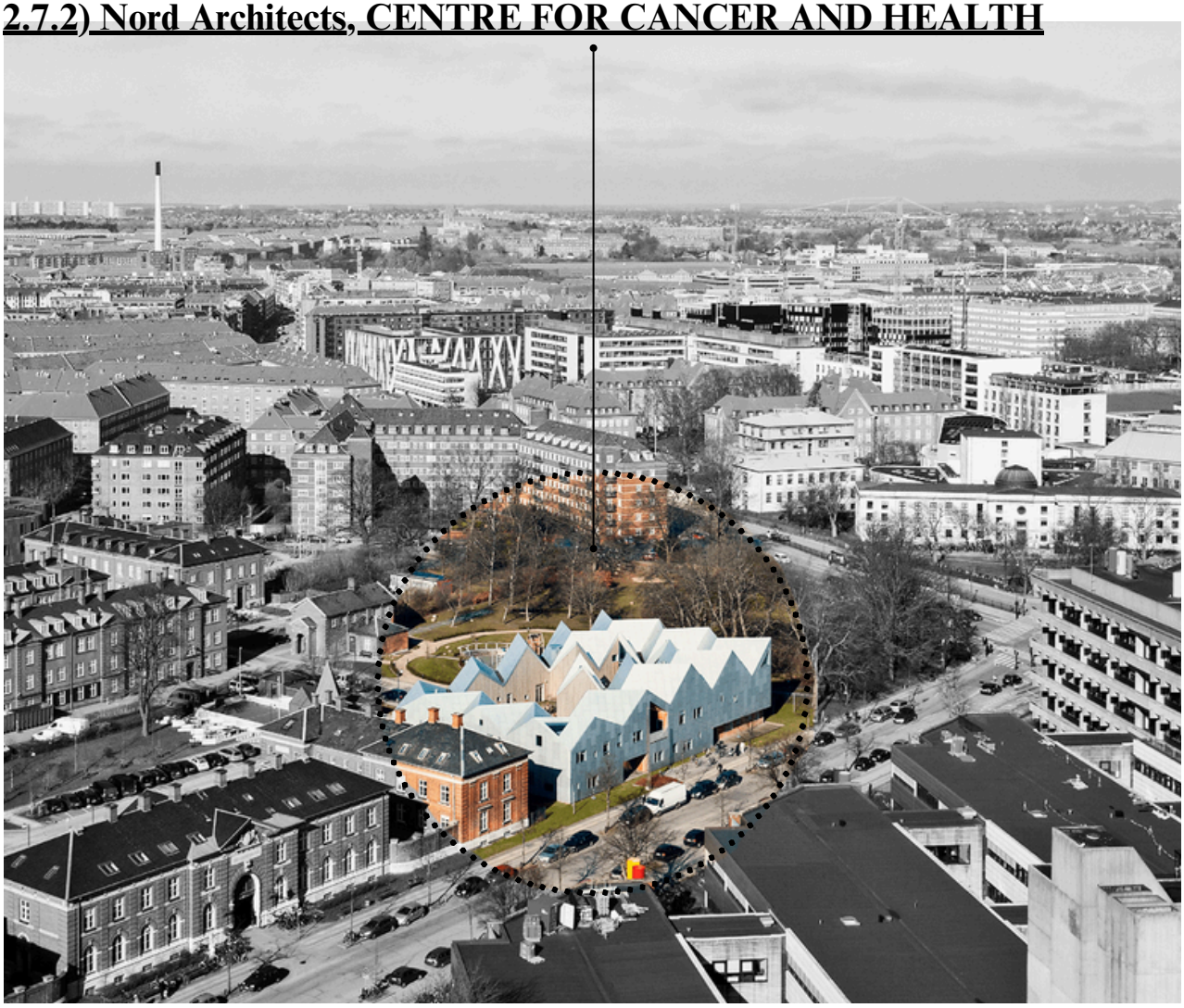
Fixed furniture in the chief physician's office



The drawing presenting the patients' room included a heating device placed under the window table

Paimio Sanatorium Conservation Management Plan, Alvar Aalto Foundation, 2016, 54-139-170

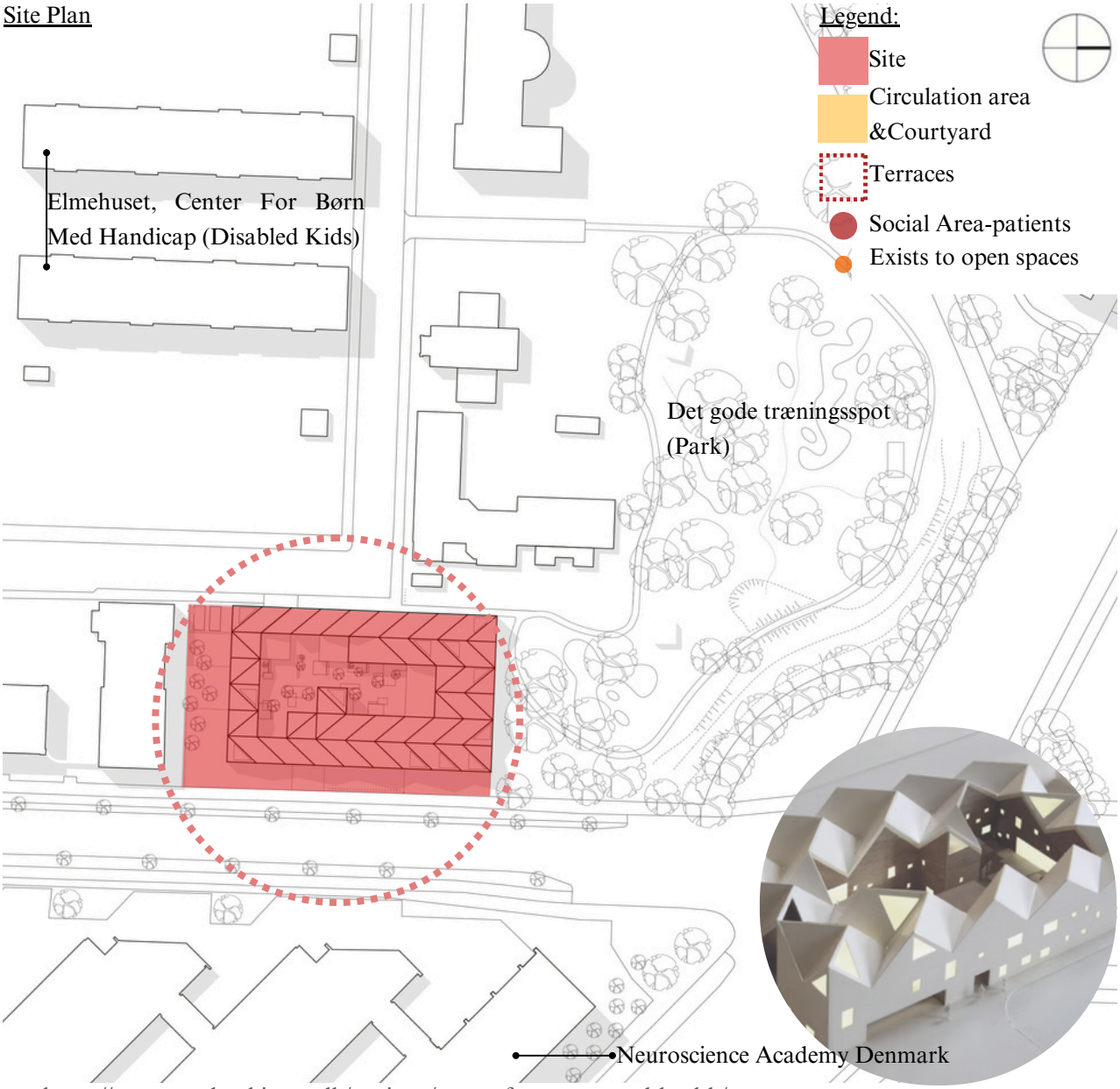
2.7.2) Nord Architects, CENTRE FOR CANCER AND HEALTH



https://www.nordarchitects.dk/work/
Edited by Nilay Yasar

"*We design solutions for the challenges of tomorrow...We thrive to be a part of these life–changing challenges and translate them into our physical environment focusing on users, quality and aesthetics.*"

Nord Architects is a contemporary architecture company is located in Copenhagen, Denmark but also internationally that focuses on six main agendas in work: Healthy Ageing, Green Construction, Innovative Education, Strategic Client Advising, Additive Transformation, and Ideal Neighborhoods. Centre for Cancer is built in Copenhagen between 2005-2009 years by the Copenhagen Municipality.
Looking at traditional hospitals, entering any medical facility is an uncomfortable experience for patients and their loved ones. Although hospitals are buildings designed to heal, it is striking that little priority is given to the emotional and healing aspects of architecture, which can lead to over-complexity in the healthcare sector and lack of communication among staff. This was different for the Copenhagen Cancer and Health Center, which was designed to foster a closer relationship between staff, volunteers and cancer patients.



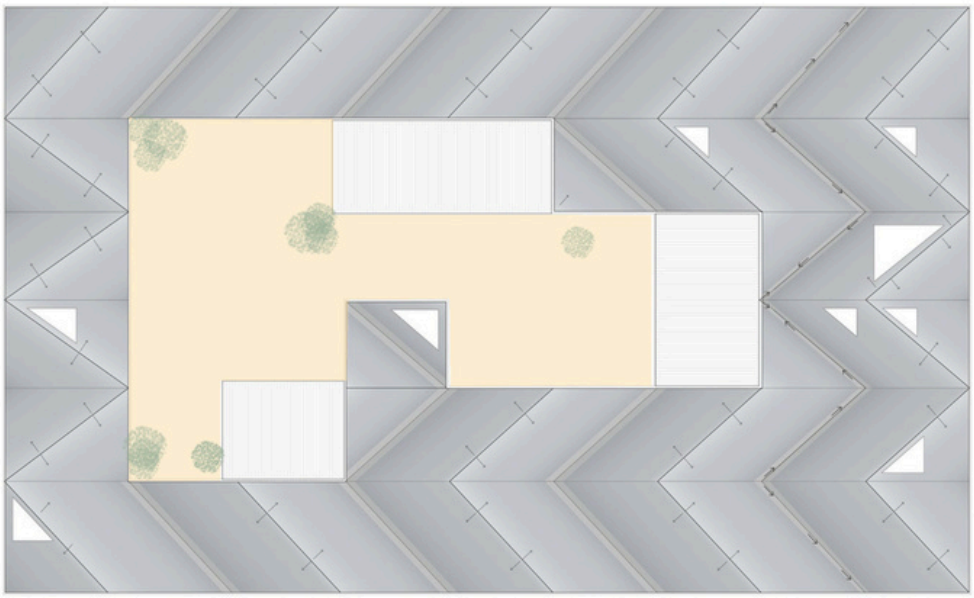
- https://www.nordarchitects.dk/projects/centre-for-cancer-and-health/
- https://architizer.com/idea/96915/
- https://www.archdaily.com/430800/centre-for-cancer-and-health-nord-architects
- https://www.google.com/maps/place/Center+for+Cancer+and+Health+Copenhagen

Edited by Nilay Yasar

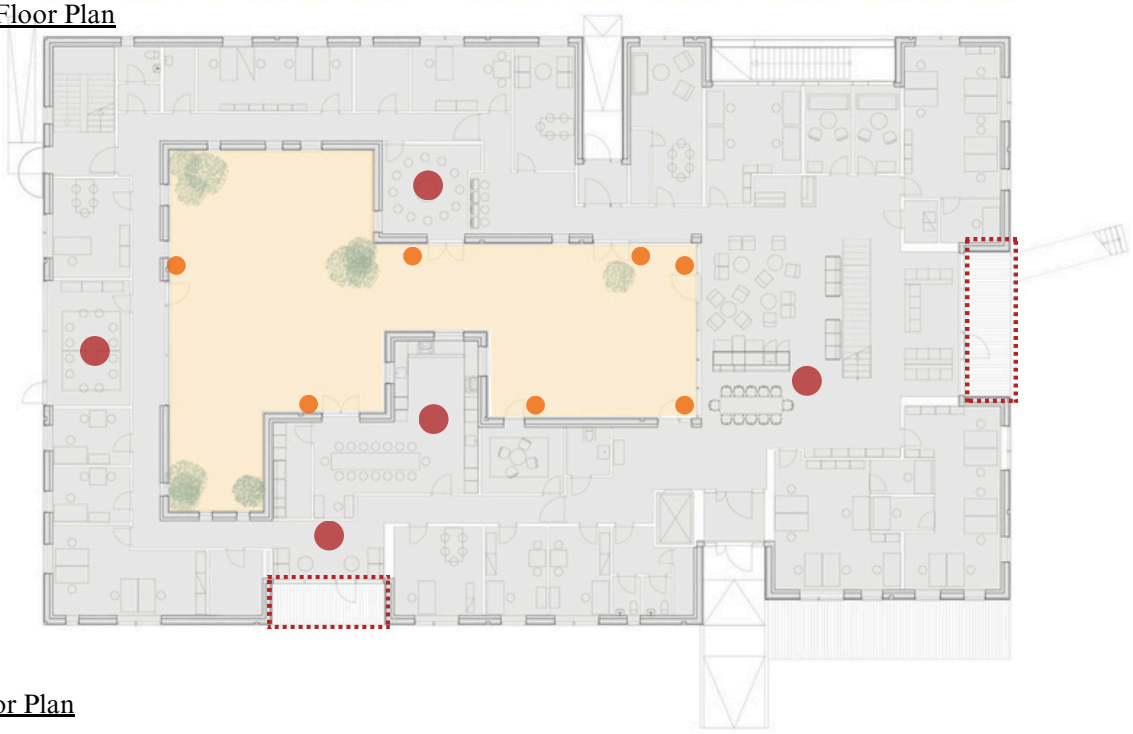
This idea remained an important part of the design, and the hospital design was created through a process between architects, patients and staff, focusing on the thoughts and feelings of the users.

The concept of the Centre for Cancer and Health is simple but cleverly designed. The goal of this project is to distance patients from the traditional hospital experience rather than highlighting the importance of cleanliness and the significance of large lobbies. Instead, the design is intended to make patients feel comfortable, as if they are in their own homes, by creating traditional social areas and houses with folded roofs linking the houses. Although the site was built near a green area, the design itself also includes some green elements within the courtyard. The building has built on a modest area 1,800 m² site. The location is surrounded by various health buildings and a green park.

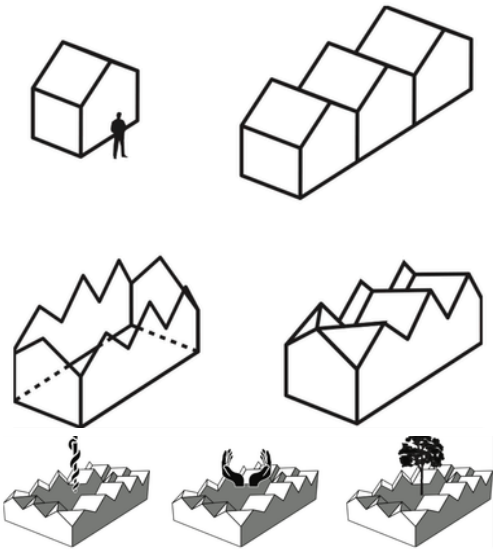
Roof Plan

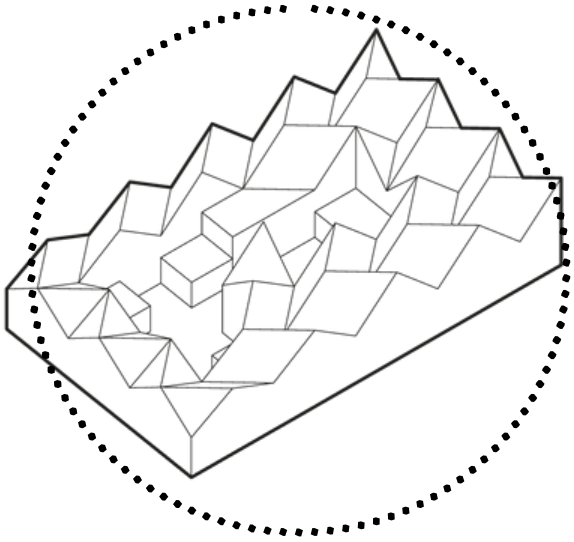


Ground Floor Plan



First Floor Plan





The inspiration for the project actually comes from origami, a Japanese paper art. These origami forms come together to create a series of houses arranged side by side, forming the overall shape of the project. The center is dedicated to courtyard to use multifunction such as green space, allowing for interaction among patients through these surrounding houses. Apart from the roof plan, the solid-void relationship also continues the origami concept on the facade and section, maintaining the influence of this idea. The use of wood as a material in parts of the design further transforms the structure into one that is more integrated with nature rather than resembling a typical hospital.

East Elevation of Centre for Cancer and Health

Section of Centre for Cancer and Health

https://www.archdaily.com/430800/centre-for-cancer-and-health-nord-architects

Plans edited by Nilay Yasar

Partial Ground Floor Plan

The part was designed to be a space where patients can receive not only as health treatment but also intended to be a place where they can perhaps cook, and develop not only in a medical sense but also in terms of mental well-being, and entertainment. The design process focused on creating warm and welcoming spaces, avoiding large lobbies, instead designing lounge areas where volunteers can assist patients and their families.

- https://www.archdaily.com/430800/centre-for-cancer-and-health-nord-architects
- https://www.nordarchitects.dk/projects/centre-for-cancer-and-health/

2.7.3) COMPARISON OF CASE STUDIES

ALVAR AALTO, PAIMIO SANATORIUM / NORD ARCHITECTS, CENTRE FOR CANCER AND HEALTH

PATIENT-CENTRIC DESIGN PHILOSOPHY:

- Aalto, revolutionarily paid attention in Sanatorium not only physical but also mental well being of tuberculosis ills by letting them involvement in the color, lighting and sound of the surrounding. (designed darker color ceiling to pleasant patients to look at while lying down, indirect lights for avoiding discomfort.)
- Correspondingly, Nord Architects designed a health center unlike a traditional hospital by aiming patients to feel like at home. The Centre includes cozy lounge rather than enormous lobbies and the plan layout encourages interaction among patients and staff, giving attention to community and comfort.
- Both focused on a specific illness in order to design a healthcare facility.

ATTENTION TO DETAIL IN PATIENT ROOMS:

- Aalto accurately designed the patient rooms caring about even all small details like the angle of the water flow in washbasins to minimize noise to the placement of heating elements to avoid discomfort.
- The patient rooms at the Centre for Cancer and Health also designed with a similar quantity of care, focusing on creating a home-like environment by creating rooms are cozy and personalized.

INTEGRATION WITH NATURE

- Aalto positioned the sanatorium in a lush, green area in Southwestern Finland, using the natural environment as part of the healing process. The large windows and balconies in patient rooms were designed to bring in plenty of daylight and fresh air and therapeutic environment which were considered essential for treating tuberculosis at the time.
- Similarly Nord Architects designed a central courtyard which not only provides a visual connection to the outdoors but also patients can engage with nature.

similarities

INNOVATIVE DESIGN APPROACHES:

- Aalto introduced the "horizontal" approach to patient care considered how bedridden patients would experience the space, influencing everything from the deeply designed of furniture to the layout of windows.
- Also Nords, by using ''origami'' forms resulted in a series of connected houses that break down the scale of the building, making it feel more approachable

differences

MATERIAL AND CONSTRUCTION CHOICES:

- In the Paimio Sanatorium, concrete, which is the most prominent material of modern architecture, was used both as the structural system of the building and as its main structural element. This provided the building with both durability and flexibility. While steel, glass, and wood were used in the interior, especially in the windows, it would be more accurate to consider concrete as the primary material.
- In Nord Architects' healthcare design, although concrete was also used, the focus was primarily on wood and aluminum materials, aiming for an extraordinary hospital facade design.

ARCHITECTURAL STYLE AND ERA:

- Aalto's sanatorium is a mark of modern age architecture. Aalto's ''clean lines'', simple forms, and a focus on the needs of the user shows that Aalto was heavily influenced by the Modern Movement, which emphasized the idea of "form follows function"
- In contrast, Nord Architects' design reflects contemporary architectural trends, which is more dynamic and informal, breaking away from the rigid geometries of modernism.

LAYOUT-EXPOSITION

- The sanatorium is a large, complex facility with A,B,C wings and specialized areas designed to treat a huge amount of patients with its 12,000m². It has different blocks to get efficient sun light and so designed with open layout.
- Instead, the Centre for Cancer is smaller, 1,800m², and more intimate to be more welcoming, with a layout that aims interaction among patients and staff, rather than being more function-driven layout like a traditional hospital. Again we see blocks but in this case as a courtyard closed layout.

In summary, comparing Alvar Aalto's Paimio Sanatorium and Nord Architects' Cancer and Health Center, it is possible to say that both are based on a patient-centered ethic and, despite being built in different time periods, they reveal an intense evolution and a different perspective in healthcare design shaped by the architectural methods and materials of their periods.

From Aalto's pioneering approach that took into account not only the physical but also the spiritual well-being of tuberculosis patients, to Nord Architects' effort to create a home-like, inviting environment for cancer patients, both projects emphasize the fundamental idea of the vital role of design in healing. Aalto's meticulous attention to details such as the silent water flow in the sinks and indirect lighting set the standard for patient-centered innovation. Similarly, Nord Architects' use of layouts based on the "origami" form which focuses on bringing the community together under one roof reflects the modern understanding that healthcare spaces are environments of comfort and interaction rather than merely functional places.

Inspired by these projects; Aalto's work could be said to demonstrate how architecture can shape therapeutic environments by blending functionality with compassion, while also connecting with human needs through the use of light, fresh air and nature. Nord Architects' design is inspired by a contemporary embrace of warmth and connection, both mentally and spiritually, by moving away from institutional coldness and employing volunteers from hospital staff.

Both designs teach that architecture has tremendous power to affect well-being in healthcare environments. By encouraging future designers to blend innovation, humanity and sensitivity to the needs of their users, they set a standard for creating spaces that heal not only the body but also the soul.

CHAPTER 3:
Spinal Cord Injury and Human Centered Architecture

Designing with Empathy

The relationship between architecture and health services is far more intertwined than it might appear at face value. Where the discussions of health space design may sound dislocated, they actually interrelate with and influence each other in very deep ways.From the past to the present, the development of health systems and their architectural structures have been a reciprocal process reflecting social values, medical developments and patient needs, and thus the architecture of healing spaces and health practices have given birth to each other, each shaping the development of the other.

The hospital revolution has reached the point where the former community ward systems have become highly specialized and are now specialized treatment areas. This change has been made possible by an increasingly sophisticated understanding of medicine and a shift in public attitudes towards a more personalized model of care rather than a collective approach to health. Early hospital wards which designed to accommodate large groups of patients, with the development of healthcare became more personalized and evident that individualized treatment and specialized environments hold the key to better outcomes. This evolution needed architecture to shift toward providing private, comfortable, and mentally supportive spaces.

The emotional and psychological dimensions of healing remain central to the design of healthcare spaces. As much as modern medicine is based upon rationalism and evidence-based practices, the human need for belief, comfort, and reassurance plays a major role in recovery. The concept of miraculous healing may no longer be at the core of medicine, but its psychological counterpart a deep-seated need for hope and support remains intact. This need also underlines the importance of creating healing environments that address much more than physical needs, thus offering spaces nurturing emotional well-being and a feeling of protection and trust.

This perspective has become particularly relevant in the light of the needs of patients recovering from spinal trauma. These usually represent complex problems that involve not only the physical level of rehabilitation but also emotional challenges. Architecture can be quite transformative, speeding up the healing process by solving these multi-faceted needs. The focus here will be on how these architectural design elements may have positive impacts on recovery and thus provide not only functional spaces but deeply restorative ones toward an integrated approach to health care; emotion, science and experience.

"One day I woke up and stared at the ceiling. I wanted to turn my head but I couldn't. I wanted to lift my arm but could not. Nothing was moving. I heard a lot of noise but could not see anything. A nurse appeared beside me.

I wanted to say something but she couldn't hear me. I wanted to scream but no sounds came out. I closed my eyes. I opened them when I heard my name being called, looked up and saw my parents. Even though it seemed to me like one second between closing my eyes and opening them again, a whole day had passed. My parents told me that I had tetraplegia. My parents told me that I was in a Brussels hospital and I had a work-related injury. My neck was broken, I was totally paralysed and I could not breathe on my own. I was thirsty and asked for some water. I couldn't drink out of the cup with a straw that was handed to me because I could not swallow. I had been working at a house. I fell off a ladder or I shifted off a ladder, I'm not quite sure anymore. I fell six metres down and landed on the concrete." (Gunther, Belgium)

Sue Lukersmith, *International Perspectives on Spinal Cord Injury* (Geneva: World Health Organization, 2013), 28.

In medical terms, SCI care dates back to the 1930s and the work of American neurosurgeon Dr. Donald Munro at Boston City Hospital who inspired Sir Ludwig Guttmann. Guttmann established the SCI unit at Stoke Mandeville Hospital in the United Kingdom in 1944, which later became the National Spinal Cord Injury Centre in 1952.The main point to emphasize here is that, Guttmann who worked on patients with SCI, introduced sports as a form of therapy and pioneered the Stoke Mandeville Games, which evolved into the Paralympic Games in 1960. This approach became the model for SCI care in the United Kingdom, the USA, and other countries.

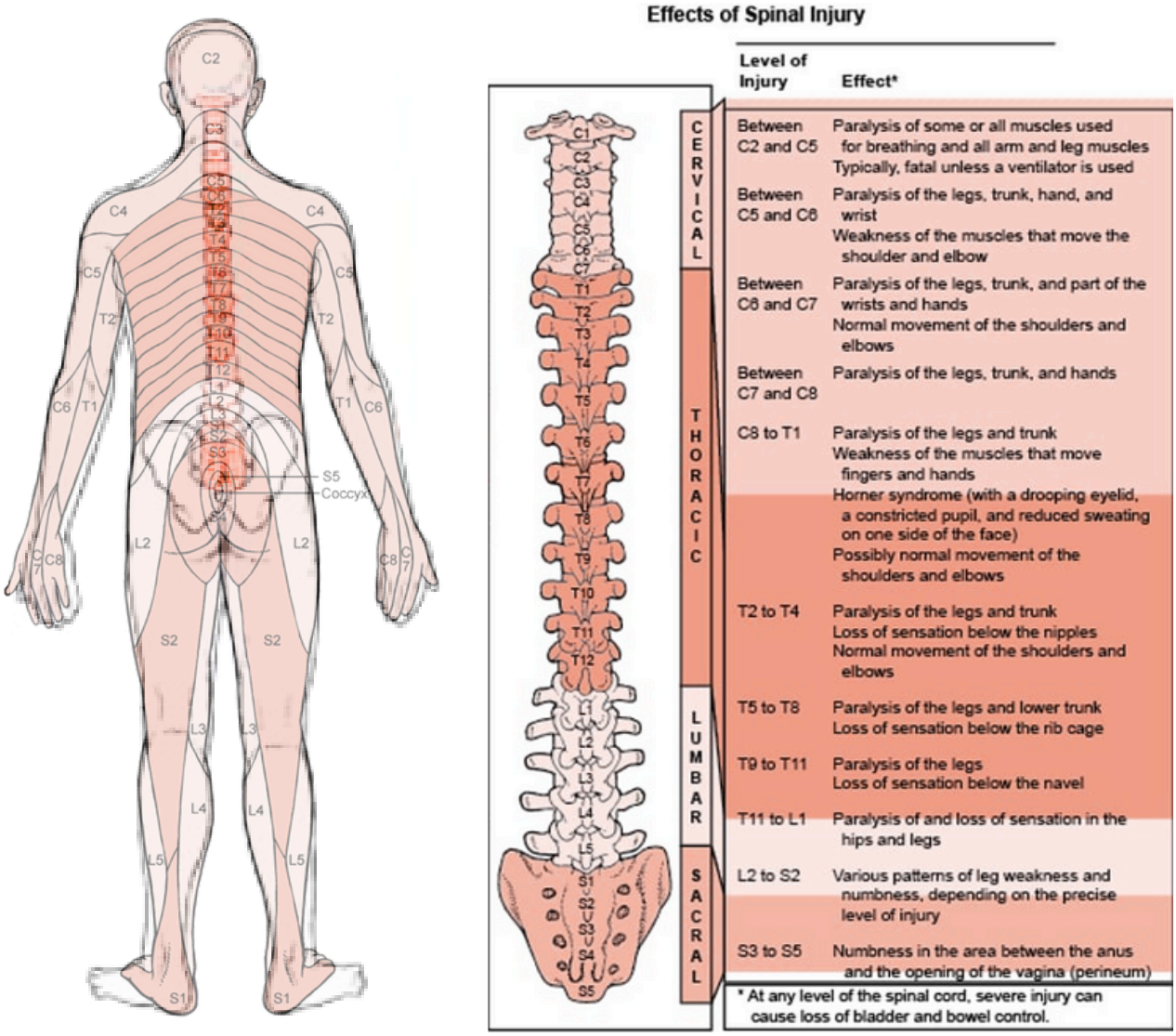
This approach also contributed to a shift in the perspective towards people with disabilities, who began to be viewed through a human rights lens. By the late 1960s and early 1970s, individuals with spinal cord injuries played leading roles in the disability rights movement across many countries.

The spine, which supports the body in an upright position, is a part of the skeletal system consisting of 24 back bones (vertebrae), and plus the tail bone (sacrum). Since the spine bears the majority of the body's weight, it is subjected to significant pressure. Cartilage discs between the vertebrae help protect the bones, and the spinal cord, which runs the length of the spine, forms a protective bony canal. The spinal cord is an extended, delicate tube like structure that originates at the base of the brainstem and extends down to the lower section of the spine. It is made up of nerves that transmit signals from the brain to the rest of the anatomy. The spinal cord serves as the primary communication route between the brain and the body. The cord is safeguarded by the vertebrae of the spinal column, which are separated and cushioned by cartilage disks.

The spine is divided into four sections, and each section is referred to by a letter.

- Cervical (C): Neck
- Thoracic (T): Chest
- Lumbar (L): Lower back
- Sacral (S): Pelvis and tailbone

Each part of the spine effects several parts of body during the injury.



Sue Lukersmith, *International Perspectives on Spinal Cord Injury* (Geneva: World Health Organization, 2013), 28.

Edited by Nilay Yasar

Spinal cord injury (SCI) can occur in two ways: traumatic or non-traumatic. **Traumatic SCI** results from external factors and can be caused by various incidents, such as;

- traffic accidents,
- falls from height,
- occupational
- sports injuries
- violence

In contrast, **Non-traumatic SCI** arises from pathological causes such as;

- communicable diseases like tuberculosis (TB) and human immunodeficiency virus (HIV)
- noncommunicable conditions such as cancer and degenerative diseases; nutritional deficiencies including neural tube defects
- vitamin B12 deficiency
- complications of medical care

Since the spinal cord's role is to connect the brain and body, neurological damage caused by both traumatic and non-traumatic spinal cord injury (SCI) disrupts communication between the brain and the body. This damage impairs the transmission of sensory and motor information to the brain.

There are two types of SCI based on the severity of the injury:

- **Complete injury**: Individuals with a complete injury have no sensory or motor function below the level of injury, including at the S4–S5 segments.
- **Incomplete injury:** Individuals with an incomplete injury retain some sensory and motor function below the level of injury, including at the S4–S5 segments.

Furthermore to motor and sensory losses, SCI injuries also disrupt other functions of the body. These symptoms can occur at various stages; some may arise primarily within the prehospital and acute care phase after injury, while others may appear at any stage.

Potential complications that may arise as a result of spinal cord injury are listed below:

- **Circulatory System:**
- Symptoms may include headaches, excessive sweating, flushed or reddened skin, blurred vision, and irregular heartbeats.
- Changes in the normal control of blood vessels and immobility can lead to blood pooling, pain, swelling, tenderness, skin discoloration, and warmth in the affected limb. Deep vein thrombosis (DVT) can cause pulmonary embolism and may be life-threatening, so it requires quick treatment with blood-thinning medication.
- Low Blood Pressure occures when a person moves from lying down to standing up. Common symptoms include tiredness, feeling faint, dizziness, blurred vision, muscle weakness, and even temporary loss of consciousness.
- **Genitourinary system:**
- It covers the urinary tract damage resulting from SCI; during this process, the patient may experience issues such as pain, burning, and neuropathic pain while urinating.
- **Respiratory system:**
- As a result of the paralysis of respiratory muscles after SCI, lung capacity may decrease, making it difficult for the patient to meet their basic need to breathe, as well as to cough and clear secretions. Individuals with SCI may need to rely on constant mechanical ventilation or other stimulating medical devices to maintain adequate breathing.

- **Neuromusculoskeletal system:**
- The patient may experience unexpected involuntary movements and spasms as a reflex. Due to damage in the muscles and nerves, the patient's mobility becomes restricted, and overall functionality decreases. In this situation, the patient may apply for a manual physiotherapy administered by therapists to strengthen the muscles and nerves. Following the therapy, the patient can also perform recommended exercises, such as passive movements or stretching, as well as active movements or exercises, to speed up their recovery process. In addition, electrical, mechanical, or thermal devices can be used to stimulate weakened nerves in the affected areas.
- **Pain:**
- Most individuals with SCI experience pain following the injury and in the recovery period. Neuropathic pain such as burning, stinging, or electric shock sensations may occur.
- During and after treatment, shoulder pain caused by wheelchair use, muscle spasms, and mechanical instability may also develop. In order to pain management; medication, exercise, massage, acupuncture, psychotherapy, meditation and relaxation, provision of assistive technology, review and adjustment of seating systems, and recommendations for activities such as transferring are required.
- **Skin**
- With SCI, bedsores *(Pressure ulcers)* may occur due to factors such as smoking, nutritional deficiencies, infections, moisture from sweating or incontinence, diabetes, and lung diseases, as well as prolonged bed rest or falls resulting from an accident.

Additionally, it must be noted that the occurrence of traumatic SCI (TSCI), which is more common in the United States than in Northwestern Europe, and non-traumatic SCI (NTSCI) can vary due to factors such as population demographics and cultural context. Understanding these factors is important for accurately interpreting trends, designing targeted interventions, and providing appropriate care for SCI patients. However, as common, an aging population has led to a rise in the average age of individuals with SCI and an increase in cervical injuries, particularly in nations with larger elderly populations, such as Italy.

3.1) MANAGEMENT OF THE HEALTH ISSUE

It was stated that SCI causes restrictions in many activities. Rehabilitation support aims to minimize these restrictions for individuals with SCI and to enable patients to return to their daily lives as much as possible. There are various rehabilitation methods for this to happen as listed:

- **Exercise:**

It is possible to strengthen weakened muscle strength and improve the function of motor nerves through exercise. Techniques such as stretching, weight training for arms and legs, electrical intervention to activate nerves, and parallel bars to improve walking and balance are exercises that target recovery. Exercise is a must for individuals with SCI due to its many physical and mental benefits such as regaining improved muscle strength and endurance, normalizing reduced muscle tension, gaining joint flexibility, and protecting heart health.

- **Teaching New Techniques:**

Another goal of rehabilitation is to maximize the individual's ability to perform basic activities despite the existing restrictions resulting from the damage. This may include performing daily actions in different ways. For example, individuals with SCI may learn new dressing techniques using the muscle function they have or receive clothing recommendations that make dressing easier. New technique strategies include teaching the use of utensils to support independence, differentiating personal care routines to conserve energy, suggesting more "doable" routines, or seeking help from "healthy" individuals for actions that need to be taken.

- **Evaluation of Surgical Options:**

When further neurological improvement is not observed in the body, reconstructive surgery may be an option; however, this is not appropriate for all individuals with SCI. Surgery may include transferring one or several muscles or tendons to improve elbow or wrist movement, hand grip, or finger control.

Additionally important point during the rehabilitation period is, not only the patient but also their family members or the other close individuals are part of this journey during the recovery period. The family or caregivers should be educated to ensure that they understand the purpose, techniques and goals of the rehabilitation program. When they are informed and actively involved, they can provide the patient with the necessary support, encouragement and monitoring in their daily environment. The act of reaching awareness together is very crucial to create a motivational atmosphere in which the patient would find the skills of continuing the practicing.

Another important point is that the patient can take on their own recovery role which means if patients can reinforce what they have learned by taking responsibility for the rehabilitation techniques and practicing them outside of formal sessions, they can make consistent progress and thus apply these skills to real-life situations. Every practice that the person does for themselves not only accelerates the recovery process, but also encourages the ability to regain greater independence and self-confidence, which are the goals of rehabilitation. If the patient receives professional care during the recovery period with a "teamwork" in which the patient's family and closed ones play an active role and the more optimal conditions are provided by the participants in this teamwork, the stronger the foundations are laid for the patient to achieve long-term success and independence during the recovery process.

(Fig.16a): Courtine's latest research paper suggests personalized electrical stimulation of the spinal cord can rapidly revive lower-body motor functions in some paralyzed patients
https://www.statnews.com/2022/02/07/walking-again-after-paralysis-early-study-suggests-stimulation-could-jolt-spinal-cord-back-to-life/
(Fig.16b): Functional Electrical Stimulation (FES) for Spinal Cord Injury
https://anavara.com/treatment/functional-electrical-stimulation-fes-for-spinal-cord-injury
(Fig.16c): Paraplegic Exercises That Can Help Stimulate Paralyzed Legs
https://thenewgait.com/blog/paraplegic-exercises-that-can-help-stimulate-paralyzed-legs/
(Fig.16d): Complete Spinal Cord Injury
https://berkelbike.com/disabilities/complete-sci/
(Fig.16e): Paralysis Exercise For Recovery Patient
https://care24.co.in/blog/exercises-for-paralysis-patient/
(Fig.16f): K. Iwahashi et al., "Effects of Orthotic Therapeutic Electrical Stimulation in the Treatment of Patients with Paresis Associated with Acute Cervical Spinal Cord Injury: A Randomized Control Trial," *Spinal Cord 55* (2017): 940–946. https://doi.org/10.1038/sc.2017.71

After SCI, individuals and their loved ones have an instinct to try to adapt to the situation by experiencing various emotions such as grief, denial, sadness, fear, anxiety, disappointment, anger. There are personal factors that allow such feelings and emotional changes to vary:

gender, age, personality, coping style, and pre-injury mental health conditions (e.g. depression, anxiety, alcohol or substance abuse) and condiyions such as post-traumatic stress disorder (PTSD); cultural beliefs and values, attitudes, social supports, provision of appropriate assistive technologies, and socioeconomic status affect how well an individual adapts to the injury.

Depression is one of the most common psychological health conditions in SCI patients. Especially during the recovery process of SCI patients, psychological health services provided by hospitals or individually; all healthcare teams working in rehabilitation centers; the attitude of doctors, nurses, therapists and all healthcare professionals towards the patient are the most important components of the recovery process. Moreover, and very importantly, it should be emphasized that there is evidence that it provides improvement in adaptation and functionality. However, providing support to individuals with SCI can be both physically and emotionally challenging, depending on the level of need.

3.2)"HUMANIZING ARCHITECTURE"

"I believe that in order to design such a hospital, one must have a very strong empathy. Because in order to design spaces where such extraordinary events take place, one must be able to understand the events and feel what is happening in them. Every designed detail can have an effect on human health; physically or psychologically, you will have an effect on a patient who spends time in that environment as an architect.
Of course, I was not conscious when I had the accident. But when I opened my eyes slightly, the first doctor I saw told me to my face that I was paralyzed from now on and needed a wheelchair. -Greetings to him from here, i am fully healed and mentioning his untrue words in my thesis in Italy.-
I did not believe it, my brain completely rejected the facts and laughed instead. But I could have believed it. Keeping myself extraordinaly high in terms of morale and not accepting what happened to me is healed me. I never believed that I would be paralyzed or not walk again.

Afterwards, of course another doctor and not the one I mentioned, a really good doctor who was competent in his field, operated on me. He said I would be able to walk in a month and look great. I believed it and it happened. I am not saying I am a miracle, my doctor said so. Greetings to him from here too, I am glad I have him.
I am not a psychologist, but what you see, hear and how you perceive these in a hospital environment affects every little piece of the recovery process. That is why the patient being treated in such a hospital environment with people who make him feel as comfortable, happy and positive as possible affects in every scenario of the recovery process. Some things cannot be proven, but they are real."
Nilay Yasar

Since the introduction of this thesis, it has been discussed that diseases and all related healthcare studies are inherently intertwined with architecture. Supporting this argument, this section aims to explore architectural elements that can accelerate the healing process by specifically addressing the psychological and emotional expectations of patients suffering from spinal injury trauma. By focusing on these individuals' unique needs,it is crucial to understand how design can contribute to their recovery.

For patients whose motor skills are impaired, the potential of incorporating the healing power of nature into architectural design has been considered. This includes investigating how nature can provide psychological and emotional support to such patients. In doing so, it is essential to consider not only tangible assets, such as physical materials, but also intangible assets, such as emotional comfort, mental well-being, and the sensory experiences of the patients. These factors must be taken into account to create a holistic environment that supports both physical and psychological healing.

Many scientific patient-centered researches have shown, as the psychological distress which inevitably follows the sickness can be contrasted with an environment able to support patients' psychological needs which means that the architectural layout must consider these aspects to create a space where the patient can reside without stress or worry.

As discussed in the first section, humanity, health, and architecture are deeply intertwined concepts that continuously influence one another. When we look at the history of hospitals in the second section, we can observe that humanity has been on a quest from past to present, seeking not only advancements in health but also an inward journey for reassurance. This historical process, which began in Mesopotamia, continued with the influence of Buddhism in Indian hospitals—a belief system that encompasses spiritual growth. During the Ancient Greek and Roman periods, people sought miraculous and supernatural interventions in temples, demonstrating the clear presence of emotions alongside science in the healing process. Following in early Christian and medieval hospitals, we see that religion and monastry played a prominent role in the healing process.

Interpreting this suggests that, perhaps because of human nature or instinct, individuals felt the need to incorporate not only scientific methods but also their beliefs and emotions into the healing process.

From the Renaissance to the modern era, significant scientific advances were made in the field of health, and tangible assets such as medicines and inventions took precedence over intangibles. However, in later periods, humanity rediscovered the importance of health and the emotional dimension of being human, and this awareness is reflected in contemporary architecture, where designs began to consider not only the physical elements that aid healing,

but also the psychological factors. This time, however, these elements were emphasized from a more scientific perspective. Since psychological factors contribute to the healing process as well as investigated also by the given case studies, why not to go further and create a design that integrates both psychological and scientific elements in such a way that the design itself heals the patient and accelerates recovery through architecture?

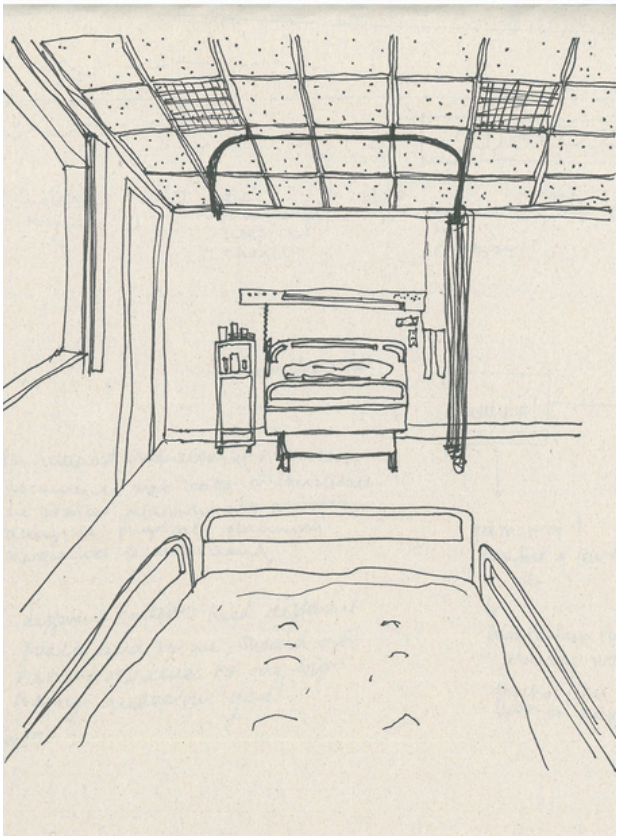
As you lie in bed, you suddenly notice the dappled sunlight on the blinds and no longer turn your head and shield your eyes. You become aware of birdsong outside the window and the soothing whir of the ventilation system down the hall. You no longer dread the effort needed to get up, but take your first cautious steps, like a child, to explore the newfound space around you. The smell of food does not bring on waves of nausea or revulsion, but triggers hunger and a desire to eat. The bed sheets feel cool and soothing—their touch no longer sends shivers through you, like chalk-squeak on a blackboard. Instead of shrinking from others, you welcome the chit-chat of the nurse who enters the room.[…]
Physicians and nurses know that a patient's sudden interest in external things is the first sign that healing has begun. But do our surroundings, in turn, have an effect on us? Can the spaces around us help us to heal? Can we design places so as to enhance their healing properties? And if we ignore the qualities of physical context, could we inadvertently slow the healing process and make illness worse?

Esther M. Sternberg, *Healing Spaces: The Science of Place and Well-Being* (Cambridge, MA: Harvard University Press, 2009), 5.

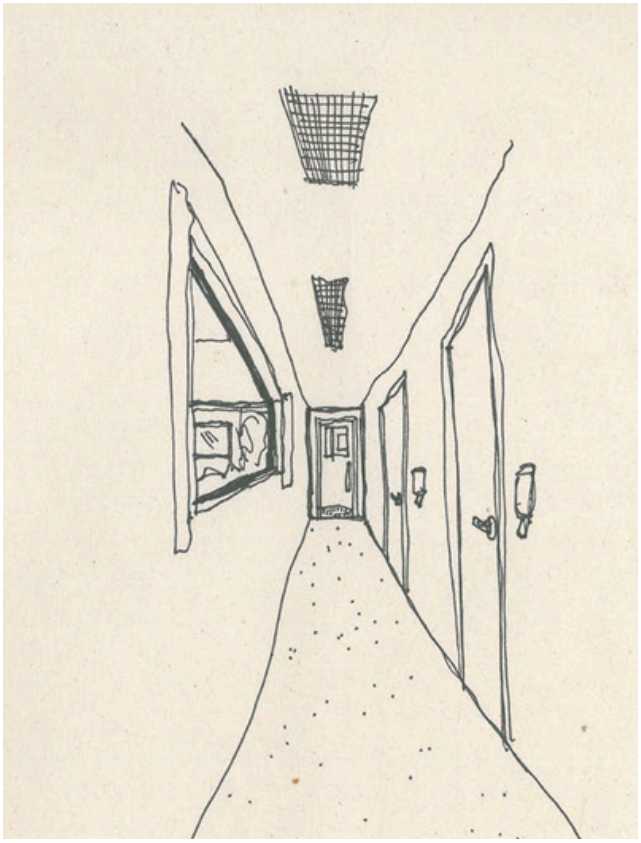
Designing a room specifically for patients with spinal cord injury requires a strong sense of empathy and a deep understanding of the challenges they face in their experience of this process. These patients often encounter numerous physical and psychological difficulties: partial or complete inability to walk, inability to go to the bathroom, loss of hand function, incontinence, lack of sences but also the overwhelming feeling of being a burden on their families or closests. These challenges are compounded by the psychological toll, especially for younger and/or teenager patients that are may be even more sensitive in these ages.

Sharing the same floor with older patients can cause young patients to feel even more isolated. In addition to these psychological internal conflicts, the patient trying to express themselves during hospital visits and being faced with questions such as how the healing process is, etc. can cause another emotional complexity. Considering that all of these are experienced within the boundaries of a hospital room, the design of this space becomes particularly important.

A hospital room should be designed to meet all the physical and emotional needs of all individuals there, especially patients. It should facilitate any activity of the person, provide privacy; while doing this, it should also create an environment where patients and all users can feel safe and comfortable mentally. The role of the hospital room is not only to provide the necessary convenience for patients to move independently physically or to host the patient during the treatment, but also to contribute to the psychological healing process with a calming and peaceful environment. For such a hospital design, the architect must have a strong ability of having empathy for the patient. A room designed with empathy can contribute significantly to the healing process, provide the necessary support and care that these patients need during such a difficult time.



"Excerpt from diary exploring the memories of the hospice: I tried to imagine what it must be like, in her fleeting moments of lucidity and consciousness to see this world around her. Her bed faced the bed directly opposite, her view being either another dying person and their loved ones or the standard blue pleated disposable curtains that divide up the rooms. They weren't pulled across at that moment, but I could trace them and follow them around the room, their metal tracks hanging low from the gridded ceiling panels pockmarked with holes. The ceiling was her last tableau."

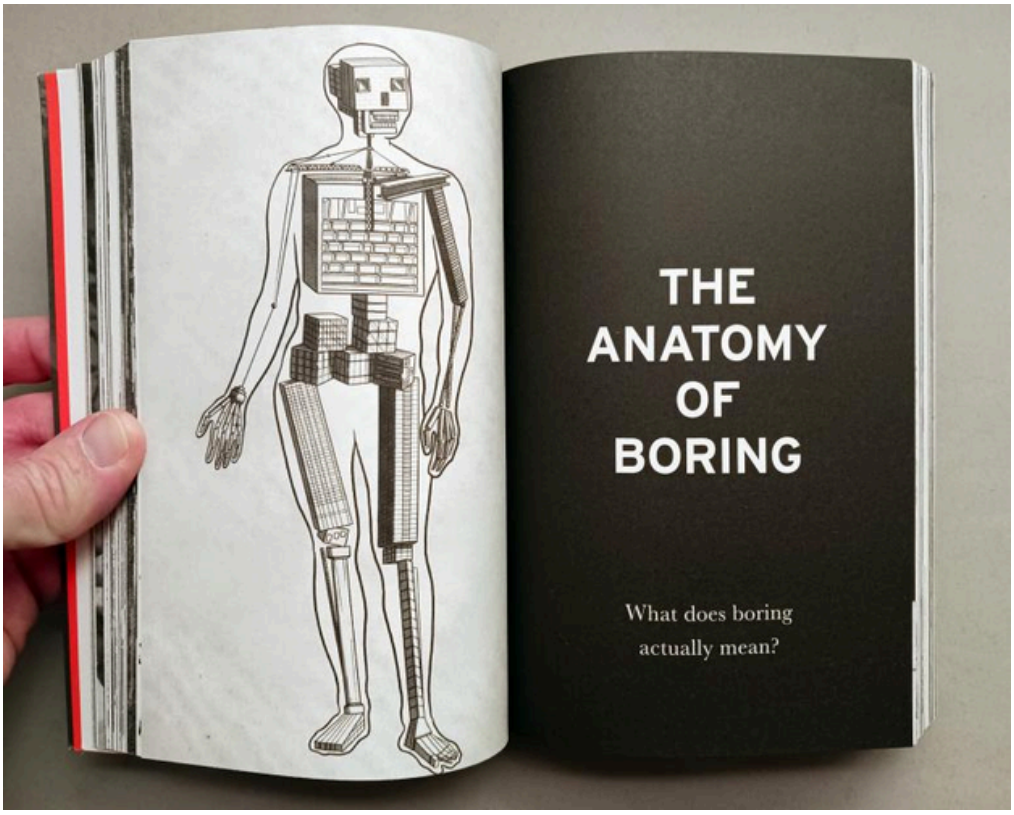


"Excerpt from diary exploring the memories of the hospice: From the map I made in my head to give myself a sense of familiarity, the building was rectangular in plan with a small courtyard space in the middle. Offset from the central courtyard was the main corridor, with the bedrooms on the other side. At each end of the corridor spaces were wellbeing and therapy rooms. They were locked. They were the only rooms that looked directly out into the garden. It seemed to me sad that the garden was cordoned off; the windowsills were so high in the corridor that if you passed in a wheelchair or bed you wouldn't be able to see outside."

Esther M. Sternberg, Healing Spaces: The Science of Place and Well-Being (Cambridge, MA: Harvard University Press, 2009), 40-43

“Such a hospital environment would not make me feel safer; rather, it would likely worsen my situation. Instead of thinking "things could be worse" and feeling grateful, I might find myself preferring to be in the worse option, given the mental state I would be in. During my recovery, seeing grid-patterned ceilings did not make me feel any better. Counting those ceiling tiles one by one certainly did not accelerate my healing process either. The barren and dull surroundings of the hospital didn't lift my spirits, and seeing my family, who didn’t want to leave my side, sleep on that uncomfortable hospital couch with no idea of how long we would be there, also did not contribute to my recovery.

I was fortunate, though, that my doctors, the primary factor in my healing process, were always positive. They never once doubted that I would not walk again, and the hope they and my loved ones gave me was what healed me. As an architect, I believe that designing rooms that give patients hope is very major, perhaps even vital. Even further; to create spaces that not only make patients feel good, but also actively contribute to their recovery and accelerate this process. These rooms should not just be white walls where patients wait for their doctor’s visit. Hospital rooms should be spaces where patients, their families, and visitors can spend quality time and even participate in activities. Imagine a hospital room that feels more like an activity room, designed to actively encourage the patient’s recovery. The room will provide hope not only through the care of the doctors, but also through its own design. A room that breaks away from the monotony of traditional hospital spaces and instead fosters a sense of optimism and participation will be a crucial part of the recovery process. Perhaps a "heavenly hospital" room that does not even look like a hospital room without the disgusting smell and is far from boredom!” Nilay Yasar



https://www.world-architects.com/en/architecture-news/insight/the-anatomy-of-humanise

In the design of hospital rooms, the description of a space as "boring" is inherently subjective. Each individual's aesthetic perception and emotional response can differ significantly. For instance, the wall color in a hospital room may be chosen for specific psychological or practical reasons. While yellow is known to symbolize energy and happiness, it may not have the same effect on everyone. A hospital room with yellow walls might provide comfort and joy to one person, while another may find it unsettling or monotonous.

However, the key question here is what truly makes a hospital room feel boring. Factors such as the room's functionality, the opportunities it offers to its occupants, and the elements that contribute to recovery play a crucial role. Especially for patients who are physically and mentally constrained, a room designed with interactive activities -even though it may seem unconventional, I am referring to engaging patients with physical and mental limitations in activities- could significantly enhance the experience, making it far from boring. Providing spaces that allow for physical and mental engagement during the recovery process could break the monotony of the environment. For example, offering activities which does not let the sufferings about their ''deficiency'', tailored to the needs of patients during their rehabilitation can keep their minds occupied, adds sociability and hope potentially improving their overall recovery. Rehabilitation specialists can provide activities that improve patients' self-confidence by creating opportunities such as group rehabilitation. Patients in the hospital who have experienced the same trauma may better understand each other emotionally, and this type of support can be more encouraging than comfort from a healthy individual. A study conducted in France found that participation in social activities and frequent meetings with friends had a positive relationship with well-being for individuals with tetraplegia (paralysis of both arms and legs due to SCI), but the direction of causality has not been proven.

"*From my own experience, I can explain how this has positive causality; during my stay in the hospital, I had lost the ability to walk. In the room next to me was another inpatient who had SCI as a result of falling from a height, and he was going through this process more depressed than I was. He refused to talk and to go to therapy. I did not go into a depression in that momente because my subconscious was rejecting what I was going through. Of course I realized later but in that moment I had created a ''shield'' and my mental state was better than someone in those conditions, my friend in the room next to me was still bedridden. But the positivity of the doctors and the therapists, -especially greetings to Levent Polis and Gülgün Gökoğlu- reached us. After some time had passed and we had both recovered, he said to me, "Nilay, your walking in a month inspired me. So I said I can do it too." I still see him and he will always be one of my closest friend.'' Nilay Yasar*

Regular physical activity can provide significant physical and social benefits; it provides a way to make new friends, share experiences, develop social support networks, and improve

overall functioning, and it provides a way to reconnect with the world and improve family relationships. The psychological and physiological benefits of social physical activity participation have been demonstrated in the literature. In addition, research from the USA has shown that people with SCI who participate in sports score higher in terms of physical independence, mobility, occupation, and social integration compared to those who do not participate in sports, and that psychological benefits are more pronounced in those who participate in team sports.Various studies have found that individuals who are active in sports have a higher quality of life.

In conclusion, whether a hospital room is perceived as "boring" depends not only on aesthetic elements of facade, but also on user experiences and functions of the the space provided. A room designed to promote recovery through social participations and activities can shift the perception from monotony to a dynamic and positive experience.
Determining the appropriate design elements for patients with spinal injuries and choosing the appropriate activities accordingly is based on a deep understanding of the condition. It is essential to thoroughly analyze the patients' deficiencies and needs in order to create a design that can support their recovery process.

3.3) THE 'HEALING ARCHITECTURE' FOR THE SPINAL CORD INJURY (SCI)

The aim of healing architecture is to create a healthy environment in terms of physical and spiritual aspects and aims to shorten the hospitalization period of patients as much as possible and to reduce the patient's stress with appropriate environmental conditions. Most academic literature accepts that the environment we live in has an effect on our health.

The World Health Organization (WHO) defines health as "a state of complete physical, mental and social well-being, beyond the absence of disease or infirmity"; this means that the environment is free from major health risks, meets the basic needs of healthy living and facilitates fair social interaction. Especially in the case of hospital buildings, the physical aspects of architecture should create a healing environment for patients, visitors and staff psychologically, mentally and physically.

Despite this, the concept of "healing architecture" is not adequately addressed in health centers in terms of physical and spiritual aspects due to various concerns such as economic, sociocultural. Negative experiences regarding the current hospital environment were recorded in the memoirs of visitors and patients by the Commission for Architecture and the Built Environment (CABE) in the United Kingdom. As a result, many health centers have demoralizing and stressful interiors; they are designed with confusing plans, have problems with ventilation and natural light due to insufficient windows, long corridors that do not lead anywhere, insulation problems that may cause problems such as noise, and are designed in a

way that does not meet the physical and psychological needs of the patient. Chapman, the president and CEO of United Health Corporation in Columbus, made the analogy, "*A hospital is like a prison."* by stating that both inmates and patients are typically housed in cold, hard floors and buildings that lack color, warmth, and variety.

Environmental psychology researchers strongly suggests that the physical environment can affect behavior in various ways. The hospital's goals are always to please patients and increase their well-being during their hospital stay. The user's behavior is related to recovery; therefore, the healthcare designer must propose designs that will promote recovery and ultimately support with its design by considering different type of architectural approaches. Although this varies depending on the patient's age and the circumstances of their experiences, it is possible to analyze common desires in similar age groups. Most children, as seen in the Figure 17 shows below, want to receive treatment in a colorful environment where their families can stay together.

(Fig.17): Ideal physical features of environmental design in children's hospital Using children's perspectives

Sara Nourmusavi Nasab, Amir Reza Karimi Azeri, and Seyedjalal Mirbazel, "Ideal Physical Features of Environmental Design in Children's Hospital Using Children's Perspectives," *Architecture and Art Faculty, University of Guilan,* 455, 459.

Although it is argued that a separate hospital is necessary for each disease, it is obvious that a separate hospital cannot be built for each patient. Therefore, a good healing hospital should be designed by taking into account certain elements that will appeal to all ages. These elements are explained below.

3.3.1) Art in the Hospital Design

The use of art in hospitals began in the 1960s in England, when hospitals hung art on their walls, creating an art gallery. The founder of the Art in the Healthcare Environment Association believed that paintings hanging in a long, sterile corridor or a sculpture displayed in a bare lobby transformed the hospital into a healing environment for patients. This idea was important because it created awareness that the hospital was a suitable place for art, where beauty and healing were linked. Lane quotes Fletcher on the effects of art in hospitals, saying, *"A heart transplant patient, for example, said that when he visited a hospital gallery near the waiting area, he was able to escape for a moment because he enjoyed the beauty of nature."* A study on the effects of art at Liverpool Hospital in the United Kingdom showed that the use of art in patients' rooms made them feel better. Art enhances the quality of a hospital room; therefore, designers should choose art that enhances the well-being of patients. Another study that heldby Carpman and Grant in 1993 in healthcare settings shows that not all type of art is healing the patients and suitable for hospital environment. By their examination of the thoughts of 300 patients in a hospital setting, it was determined that patients preferred nature-themed images and that abstract art prevented them from feeling good in this environment. While nature paintings and other emotionally appropriate art may elicit positive responses, there is evidence that inappropriate art styles or visual content can increase stress and lead to other negative outcomes.

In addition to visual art, music and natural sound elements also have positive effects on the patient. A study on patients suffering from intense pain due to burns found that when the sounds of nature, such as ocean, waves, and waterfalls, were used as an environmental distraction with the therapeutic effects of sounds or music, both anxiety and pain intensity were reduced in patients.

Based on my own experiences, not visual one but the listening, I strongly believe that art has a really important role in the field of health, especially for spinal cord injury patients. In the hospital where I had my surgery, I was lucky enough to have had my surgery in a really good private hospital where they had also given a pianist a place at the entrance. Of course, I was not in a position to notice the piano when I first arrived at the hospital, but after a few days, my father said that there was a pianist downstairs and that he was sure I would enjoy listening to it. I still didn't want to, even though I love the sound of the piano. Upon insistence, I was put in my wheelchair. After the surgery, I was paralyzed from the waist down. I could barely move my toes. We went down to the lobby in the elevator, I still remember it like it was yesterday. The pianist just kept playing. As he played, I started to keep the rhythm with my legs. The miracle happened. I couldn't believe my eyes, he couldn't believe his eyes. I am still in contact with the pianist, Oğuzhan. It's a moment I will never forget.
Nilay Yasar

3.3.2) Color in the Hospital Room Design

From an evolutionary perspective, humans had to evaluate the features of their environment to distinguish between those that threatened or supported their comfort zone. Color can have a positive effect on mood and behavior, and psychological and emotional effects can be achieved through the use of color. Even the effects of colors may vary depending on factors such as gender, cultural differences, and age, in any case, choosing the right color according to the disease in hospital design can support the healing process in the hospital environment. Light colors make a hospital room appear larger, while dark colors make the room appear smaller; warm colors can make a room feel warm, while other colors can make it feel cold.

Researchers investigated patients' response to color and thus presented questions that need to be asked about how color selection should be done in a hospital environment:

- Who will be exposed to the current colors? (patients, visitors, staff, etc.)
- How long will individuals be exposed to the colors?
- What is the nature and severity of the disease?
- Will a diagnosis of cyanosis or erythema be evident by the surrounding colors?
- What is the age range of the patients?
- Will the colors be satisfactory for men, women, and children?
- Will the colors contribute to visual acuity in surgery?
- Will the colors inspire a positive attitude towards healing?

Pellegrini, Schauss, and Eirk (1980) examinated the effect of the **bright pink** color on muscle strength. The findings revealed that male college students had lower muscle strength when looking at pink cards than when looking at blue cards. In the study, cold colors such as **blue** and **green** have attracted attention with their calming and peaceful properties. These colors give patients a sense of comfort and create a more peaceful environment mentally. **Blue** is generally known for its associations with trust and peace and is preferred for this purpose in areas such as intensive care areas and patient rooms. Green also offers a relaxing atmosphere by evoking nature. On the other hand, warm colors such as **red** and **orange** create a sense of energy and liveliness. However, the intensive use of these colors may not be appropriate in hospital environments, as their high stimulating properties can increase anxiety. These colors can be used more in areas where patients will be present for short periods of time, such as rehabilitation areas or waiting rooms.

From the other perspective, Mahnke (1987) additionally recommend that the following five colors, specifically, should be avoided in healthcare designs;

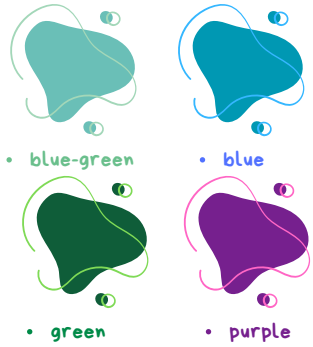
White should be avoided due to the brightness it causes and the emotionally sterile nature of the color. Also, although white is traditionally associated with health, excessive use can give a sterile and cold feeling, which can be uncomfortable for patients. Red should not be applied in its pure as it may increase anxiety, instead; softer shades and/or muted tones of red are preferable.

Purple is considered unsuitable because of the yellow-green afterimage it leaves, which clashes with human skin tones. Yellow-green are discouraged, as this color gives human skin a sick look.

The effect of colors on psychology has been a subject of interest from past to present. Today, the impact of colors on patients is also being studied. Figure 18 below presents a current study in terms of health and treatment.

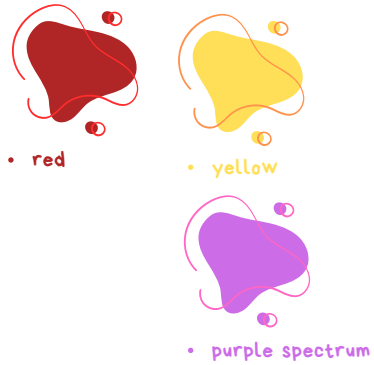
cool colors:

- features:
- Relaxing, low visual stimulation
- Reduces stress, time feels like it passes quickly under these colors
- Makes objects appear lighter, rooms seem larger
- usage:
- Suitable for areas needing relaxation and focus
- Intensive Care Units, hospital sections, emergency rooms, operating rooms
- Green is recommended for official rooms to enhance readability
- caution:
- Potential for boredom in environments dominated by these colors



warm colors:

- features:
- High visual stimulation, time feels slower under these colors
- Objects appear heavier, rooms seem larger
- Used to enhance motility and excitement
- usage:
- Suitable for environments needing happiness and joy, helpful for reducing depression, boredom, and stillness
- caution:
- Risk of excessive mobility, mental disorders, visual disturbances, and distress
- Should be avoided in intensive care units, cardiac sections, emergency rooms, official rooms, and children's sections



	effectiveness	use in hospital	prohibition of use
yellow	• anti depression • improves the low blood pressure • create happiness and focus • treatment for weakness	• nursing station • elderly people section • depressed people section • orthopedic and physiotherapy section	• maternity ward • neonatal ward • mental disease ward • children ward (overuse of yellow may cause visual chaos, eye fatigue or reduction the sight power)
red	• Increase blood pressure and heartbeat • Increase body temperature • Motivating and exciting	• Rheumatism disease section • Pulmonary disease section • Digestive disease section	• Mental disease ward • Heart disease ward • Intensive Care Unit • Surgery section (due to increased blood and injury perception, not suggested for hospital use)
blue-green	• Lowest chaos among colors • Relaxing • Reduces blood pressure and body temperature • Strong disinfectant	• Emergency section • Surgery section • Intensive Care Unit • Coronary Care Unit • Women section • Pulmonary diseases section • Section for mental patients (environments needing relaxation, focus, and stress reduction)	• Diagnostic section of the heart (Cool colors reduce blood pressure, warm colors increase blood pressure, causing difficulty in accurate diagnosis)

(Fig.18): Effects of colors

"Study the Mental Effect of Color in the Interior Architecture of the Hospital Spaces and Effect on the Patient Tranquility," 10, 14, 15.

Edited by Nilay Yasar

3.3.3) Light in Healthcare Environment

Lighting in hospitals has psychological and effects on people. For the artificial lights, it is important for patients, relatives and staff that the light is not dazzling. In an orthopedic hospital in Poznan, floor spotlights or light strips were considered the most sensible solution to avoid disturbing anyone getting up at night to go to the bathroom or to take medication, whether it be a caregiver or the patient themselves. However the situation is different for caregivers because they need to stay awake throughout the night. So that the environment in which the light will be used in hospitals is important for light selection just as argued with color. Gerard examined the effects of colored lights on psychophysiological functions and his studies found that colors significantly affected blood pressure, respiratory rate, skin conductance, brain waves. Participants felt ore tense and aroused under red light and feeling bored and disinterested under white light.

Apart from the artificial light, various studies have proven that patients with optimal natural light sources have shorter lengths of stay. For instance, a research conducted at the Mackenzie Health Sciences Centre in Edmonton, Canada, discovered that patients with depression who had exposure to natural light makes an average hospitalization less compared to rooms with poor lighting. This not only represents a significant advantage for patients, but also enhances the overall efficiency of the healthcare facility by allowing it to treat more patients over time. Also another study by Benedetti and his collagues, have proven that patients with seasonal affective disorder (SAD) or bipolar feel better in bright light. They discovered that bipolar depressed patients staying on the east side of the hospital, which is the side that receives the most light in the morning, had a hospital stay shorter than those on the west side, which is the side that receives the least light in the morning. It has also been noted that morning light has a greater positive effect on SAD and bipolar patients compared to winter and evening light.

Another investigation was about the effect of natural light of hospitals on patient pain. Patients who underwent elective cervical and spine surgery were admitted to two different sides of the hospital after surgery; the brighter side and the darker side. The observation found that patients exposed to more sunlight experienced less perceived stress, had marginally less pain, took less pain medication per hour, and had a decrease in pain medication costs. 141 nurses in Turkiye found that nurses exposed to at least 3 hours of daylight per day experienced less stress and were more satisfied at work. However, most hospital rooms, nurses' and rest rooms are lack of windows or access to natural light.Considering the possible psychological conditions of staff, patients and particularly that spinal cord injury patients; it is possible to accelerate the healing process by providing sufficient natural light.

3.3.4) Nature in Hospital Design

The concept that nature supports healing has existed for thousands of years, back to classical times when temples dedicated to Asclepius, the Greek god of healing, were located on hilltops away from towns and often with the views of the sea. However, in the late 20th century, hospitals gave more importance to healthcare equipment than to patient comfort. In the early 1970s, most hospitals used air conditioning in Radiology Departments to protect healthcare equipment such as X-Rays. As technology developed in the healthcare field, architects thought that patients would adapt to areas suitable for these technological devices; instead of technology serving patients, patients tried to adapt to these environments prepared for technological equipment.

Roger Ulrich's 1984 study built on this tradition, aiming to determine whether views of nature could ease the stress of hospitalization and, in turn, promote health improvements. This approach aligned with architectural principles seen in the Alvar Aalto, who integrated natural surroundings into his designs and constructed the tuberculosis sanatorium among the hills with the nature that demonstrates the architect's belief in the powerful link between design, health, and the natural environment.

Light and nature in hospital design are interconnected with each other regarding to the speed of recovery with the fact that the seeing nature and getting the light could be by the same openings of the hospital room. The earliest exploration, published in Science in 1984, revealed that patients in hospital rooms with windows overlooking natural landscapes got better more rapidly. Also a survey by Verderber in 1986 showed that bedridden patients highly valued rooms with views of nature, increasing mental and physical health.

A study conducted in Sweden on heart patients and people in intensive care found that patients who were shown landscapes featuring natural elements such as trees and water had lower levels of stress than patients without visual interaction, and therefore required less painkillers. However, the fact that patients shown abstract visuals had worse outcomes confirmed that natural scenes could be a necessary tool to support recovery. Similarly, Ulrich's 1984 study found that patients who had undergone abdominal surgery were placed in different rooms, and that patients who were in rooms with a view of nature; they were emotionally stronger and required less painkillers, had shorter hospital stays which means that the recovery times were faster than those in rooms with a view of brick walls. In another study conducted by Ulrich, Simons and Miles; not only for patients but also thehealthy individuals who saw natural images in a clinic where they went to donate blood, confirmed that they had lower blood pressure and heart rate, thus emphasizing that natural landscapes improve mental health not only in patients but also in healthy individuals.

In conclusion for the nature in the hospital design, studies have shown that natural landscapes, whether real or simulated, provide significant therapeutic benefits. Natural landscapes have been shown to reduce pain stress, anxiety, and feeling of disappointment; support healing and positively affect mood with a strong connection between nature and human comfort.

The general overall, the design of healthcare environments plays a critical role in improving the healing process, especially for patients with spinal cord injury (SCI), and incorporating the principles of curative architecture can meet the physical, psychological and social needs of patients, transforming hospitals from places of treatment into curative environments.

This approach involves the integration of natural elements, appropriate lighting and carefully selected design features. Access to natural light, nature landscapes and spaces designed to encourage social participation and interaction can significantly improve patient outcomes. For example, exposure to sunlight has been shown to reduce stress, improve mood and shorten hospital stays. Similarly, views of natural landscapes can relieve pain, reduce anxiety and promote faster recovery.

Incorporating art and music into hospital settings can further improve the healing experience. Nature-themed art and relaxing sounds have been shown to reduce stress and create a feeling of comfort, while inappropriate styles or overstimulation can hinder recovery. Correspondingly, the strategic use of color in hospital rooms, comforting colors such as blue and green promote relaxation, while warmer colors can affect the patient's mood and behavior when used in small amounts to revitalize areas without creating stress.

It should also be emphasized that successful recovery environments require an in-depth understanding of the special needs and current situation of patients.This wisdom allows designers to create spaces that not only meet clinical requirements, but also promote well-being, autonomy and social integration. The farthest goal is to update the perception of hospitals from just sterile and intimidating to dynamic, inclusive and spaces that promote holistic healing.

CHAPTER 4:

Healing Gardens as Therapeutic Architecture

Nature's Role in SCI Recovery

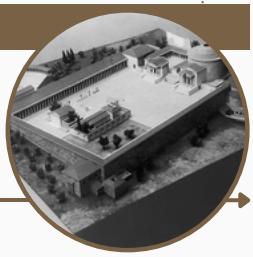
3000 BC

invention of writing

476 AC

Fall of Roman Empire

ANCIENT AGE[1]



- The earliest healing sites, such as Pergamon, Asclepius at Epidaurus, were sacred spaces located on hillsides with scenic views, water, and greenery.
- Hospitals of this era resembled classical temples, emphasizing healing through religious rites, rituals, and miracles.
- Landscapes played a key role in the healing process, incorporating natural water for cleansing and amenities like libraries, theaters, and marketplaces to create aesthetically pleasing and therapeutic environments.

1492 AC

Columbus discovered America

12TH CENTURY

14TH CENTURY

16TH CENTURY

THE MEDIEVAL AGE [2]

Walled Medieval Restorative Garden

St. Bernard

- Healing gardens appeared in medieval monastic infirmaries, integrating sunlight, fresh air, and plants as essential components of recovery.
- Courtyard gardens provided sensory solace, benefiting patients' mental and physical health.

MODERN AGE

RENNASAINCE [3]

- During the Renaissance, the healing power of gardens in healthcare was largely overlooked as science began to take precedence.
- Exceptions included a mental hospital in Zaragoza, Spain, where garden therapy and agricultural activities proved beneficial for mental health, and the Ospedale Maggiore in Milan, Italy.These institutions showcased early integrations of therapeutic environments and structured layouts in healthcare design.

17TH CENTURY

1760 AC

Industrial Revolution

18TH CENTURY

MODERN AGE

HEALING GARDENS IN 17TH AND 18TH CENTURIES [4]

Les Invalides in Paris

Louis XIV

Philippe Pinel

William Tuke

- Hospitals like Louis XIV's Les Invalides in Paris incorporated healing gardens with courtyards for sunlight, fresh air, and exercise, reflecting an understanding of nature's therapeutic benefits.
- Philippe Pinel and William Tuke revolutionized mental healthcare by replacing physical punishment with psychological support and activities like gardening and farming, emphasizing positive behavior and socialization. This approach established landscapes as vital in mental health treatment.
- Antonio Petit's different approach with radial design for the Paris Hotel-Dieu (1774) further innovated hospital architecture, enhancing ventilation and incorporating landscapes to promote healing.
- Gardens during this era focused on air purification and creating restorative environments.

Hotel-Dieu in Paris

LATE MODERN AGE

HEALING GARDENS IN 19TH AND EARLY 20TH CENTURIES [5]

- Hospitals embraced pavilion designs inspired by Florence Nightingale's advocacy for fresh air, sunlight, and gardens in healing.
- German theorist Christian Cay Lorenz Hirschfield also emphasized integrating gardens directly into hospital designs for patient well-being.
- The conservatory at Leeds General Hospital in England served as a therapeutic indoor winter garden. Filled with plants, it improved air quality by removing toxins and providing clean oxygen. This combination of light, plants, and fresh air offered a restorative escape for patients, visitors, and staff from the clinical environment.

Florence Nightingale

Christian Cay Lorenz Hirschfield

Leeds General Hospital in England

1945 AC

End of World War II

LATE MODERN AGE

- Despite the rise of laboratory medicine and high-rise hospital construction in the early 20th century, gardens remained valued for their healing benefits, reemerging after World War I in veterans' hospitals with extensive green spaces.
- During the tuberculosis; sanatoriums prioritized natural elements. These innovations highlighted the enduring importance of nature in healthcare environments.

CONTEMPORARY AGE[11]

- From 1950 to 1990, economic priorities led to the decline of gardens in hospital design, replaced by high-rise buildings, air conditioning, and parking lots. However, the late 20th century saw a revival of interest in therapeutic gardens, emphasizing a distinction between "healing" (holistic well-being) and "treatment" (symptom-focused care). Healing gardens became integral to healthcare, acknowledging the mind-body connection.
- Key examples include Maggie's Center in Dundee (2003), designed by Frank Gehry, featuring a labyrinth grassland and walking paths for relaxation and activity, and REHAB Basel in Switzerland, a rehabilitation center for spinal cord and brain injuries that integrates gardens and courtyards into its therapeutic design.

The first healing garden that has seen was in the ancient times with the site of Asklepion at Epidaurus that shows enormous connection between nature and therapeutic cures. In these ages, natural elements such as water, greenery areas and landscapes were considered crucial for the healing process of sicks. People of these era believed that the nature has a vital role for the recovery.

During the medieval ages, monasteries included gardens that provided patients with fresh air, sunlight, and a calm environment favorable to healing. In the monasteries, the access to healing garden was like from the openings of the interior space that opens to to a semi-open space which covered by arches; and from there to the exterior gardens, these gardens were walled in to provide privacy. These healing spaces not only served the sick, but also offered spiritual solace, emphasizing the holistic approach to health that was characteristic of medieval healthcare.

By the Renaissance, although there are examples to the contrary, the idea of nature centered healing approach lost its importance with the reason of the medical phenomena gave priority to scientific approaches rather than gardens.

In the modern and late modern era, the concept of healing gardens effected by the shape of living conditions. To be more clear, while natural areas and landscapes considered to be integrated in the hospitals in 17th and 18th centuries; the construction of high rise hospitals and industrialization caused the reduction of gardens in 20th century. But also in these era there was the exceptions; therapeutic landscape, natural lightening, fresh air and gardening were revealed during the World War 1 especially in the hospitals of veterans and tuberculosis sanatoriums.

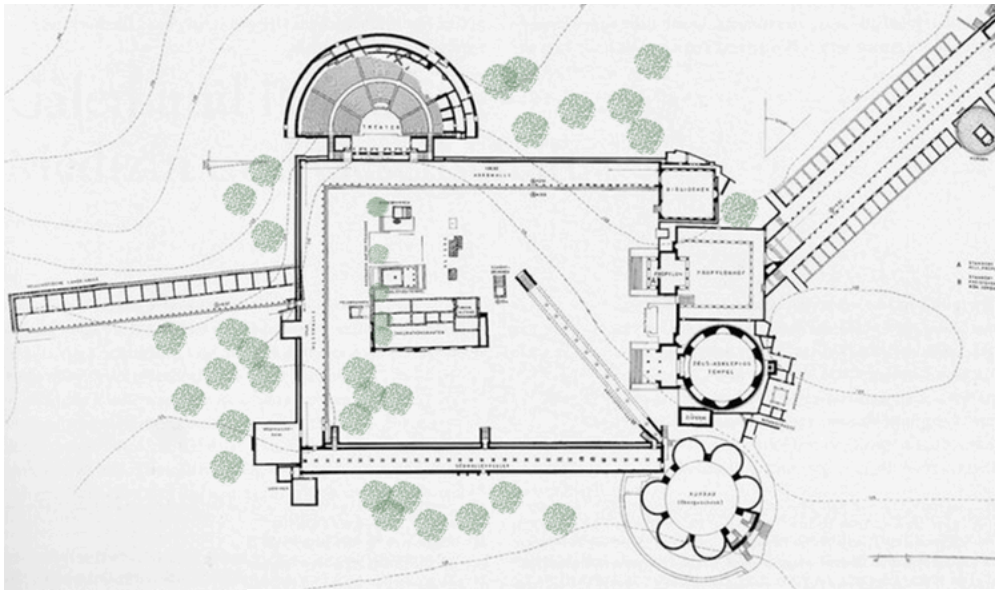
In the contemporary era, the importance of healing gardens in specialized rehabilitation centers and hospitals for the treatment of spinal cord injury (SCI), has been refocused. Studies and researches carried out in Europe, including Italy, with the sensitivity given to this subject have increased. Emphasizing the psychological and physiological benefits of being together with nature, examples such as Horatio's Garden and REHAB Basel in Switzerland, which are also examined in this chapter, have projected the idea of integrating green areas into healthcare environments. These examples have presented the importance of both physical rehabilitation and mental restoration to patients in modern hospital design and have developed a positive approach in a holistic sense not only for patients but also for their relatives and hospital staff.

The chapter has emphasized the necessity of integrating nature into hospital environments by moving it from the outdoors to the indoors to promote healing and well-being, especially for individuals with spinal cord injuries. The methodology also included comparison of case studies and interviews that held by spinal cord patients and professions included to be used in the project phase, aiming to design the most optimal environment for spinal cord patients.

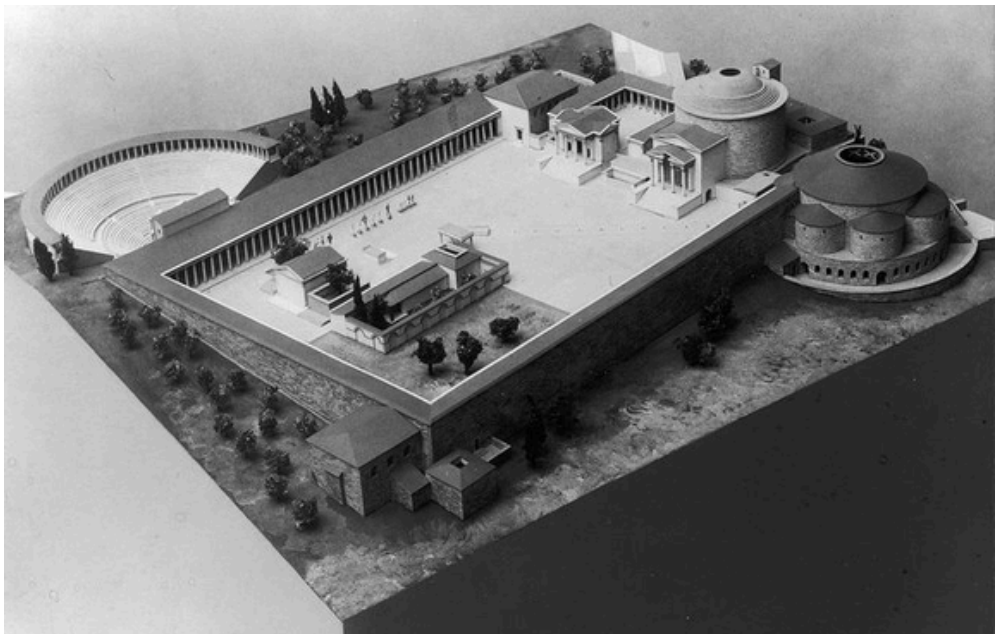
4.1) ANCIENT AGE

The earliest known healing sites include the Pergamon, Asclepius at Epidaurus, which wielded from the 4th BC to the 6th century AD (Figure .....). This site was considered as a sacred place with its location on a hillside with wide ranging views, water, and surrounded by greenery. Hospitals of the period were modeled after classical temples because of the belief of healing with religious rites, miracles and/or rituals. The landscape was also integral to the healing process, natural water was used for cleansing rituals; while a library, museum, theater, marketplace, and trees provided an aesthetically pleasing setting for their residences.

Case Study:Pergamon Asclepiusat Epidauros



Pergamon, plan of Asclepiad and sanctuary complex at Epidauros, 5th century BC
https://deepmappingsanctuaries.org/asklepieion-of-pergamon/
Edited by Nilay Yasar



Marco Galli, "Pilgrimage as Elite Habitus: Educated Pilgrims in Sacred Landscape During the Second Sophistic" *Pilgrimage in Graeco-Roman and Early Christian Antiquity,* 2007, Sapienza University of Rome.

4.2) THE MEDIEVAL AGE

In the Medieval age, healing gardens appeared in the 12th century with the medieval monastic hospices; garden, sunlight, and fresh air were seen as essential components of recovery for the medieval monastery infirmaries. Many monasteries in Western Europe provided physical and spiritual comfort to pilgrims, the homeless, the sick, and the dying that were typically, patients' cells overlooked a courtyard garden. It was believed that the healing process benefited from sunlight and a place to sit or stroll among seasonal plants. St. Bernard (1090-1153) described the sensory qualities of the healing courtyard garden at the hospice of his monastery in Clairvaux, France:

Within this enclosure, many and various trees, prolific with every sort of fruit, make a veritable grove, which lying next to the cells of those who are ill, lightens with no little solace the infirmities of the brethren, while it offers to those who are strolling about a spacious walk, and to those overcome with the heat, a sweet place for repose. The sick man sits upon the green lawn, and while inclement Sirius burns the earth and dries the rivers, he is secure, hidden and shaded from the heat of the day, the leaves of a tree tempering the heat of that fiery star; for the comfort of his pain, all kinds of grass are fragrant in his nostrils... The choir of painted birds caresses his ears with sweet modulation, and for the care of a single illness the divine tenderness provides many consolations, while the air smiles with bright serenity, the earth breathes with fruitfulness, and the invalid himself with eyes, ears, and nostrils, drinks in the delights of colours, songs, and perfumes."

This understanding of the garden's influence – intended to provide patients with a sense of spiritual peace and hope – is reflected in the design of the abbey courtyard gardens of this period. The centre of the abbey was traditionally the most important open space and a symbolic spiritual garden. A Romanesque peristyle arch usually provided a sheltered passage between rooms as shown Figure 19. The enclosed garden emphasized control and order, providing the viewer with an ideal perspective of nature. The gardens were a deliberate design, intended to calm and relax the patients.

(Fig.19): Medieval Cloister Garden: The Judy Black Garden in the Cuxa Cloister
https://www.metmuseum.org/about-the-met/collection-areas/medieval-art-and-the-cloisters/met-cloisters-gardens

Medieval community valuing of gardens was not limited to their ability to heal the sick; walled gardens were also a sign of a wealthy and bourgeois way of living. Here it is important to mention that from the Fig.20, it is clear that even the garden is in ‘’outside’’ it is actually ‘’inside’’ with the wall surroundings. Also in these ages, people needed privacy and preferred to make the ‘’walled’’ medieval garden that has some boundaries and created a somehow indoor space within outdoor.

Reading or simply meditating on a lit page, playing musical instruments or board games, and reciting poetry in the privacy of one's enclosed garden were common pastimes for the wealthy merchant's wife or noblewoman. Pleasure gardens often included fountains, manicured lawns, orchards, and flowerbeds. In the spring and summer, these paradise gardens provided fragrances, shade, and the sound of birdsong, a place to play the psaltery, harp, or small organ, read, play chess or backgammon, or simply relax.

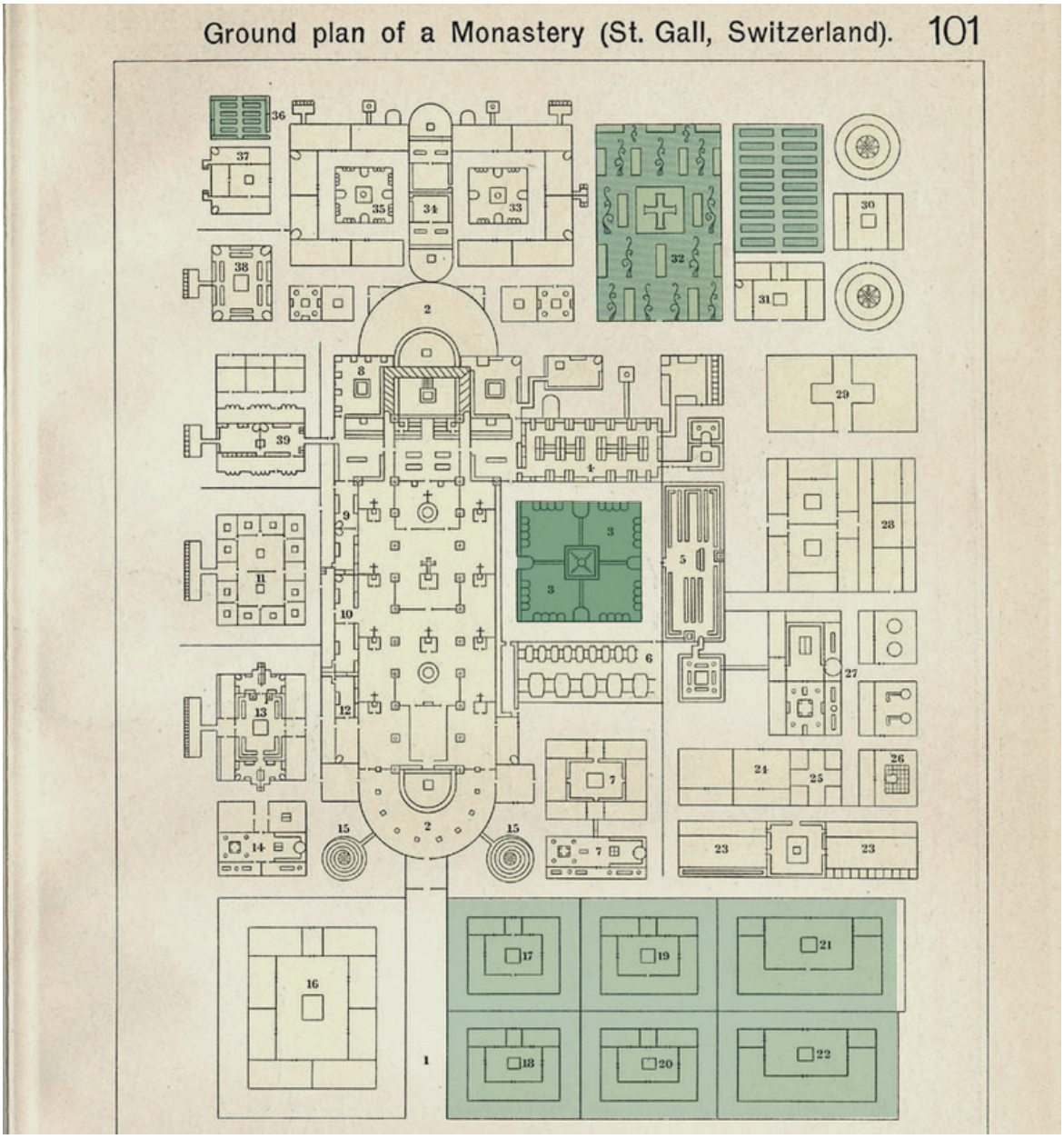
(Fig.20): A healing medieval garden with walls, water and green elements that users gather

Debra Barnes, *Healing Gardens in Healthcare Facilities: Linking Restorative Value and Design Features,* 4.

Walled Medieval Restorative Garden
https://starofnature.org/medieval-garden-plants-and-layout-how-to-design-a-medieval-garden/

During this period, military hospitals in Rome had separate, naturally lighted, cross-ventilated wards to prevent cross-infection and provide a healing environment, so the design of monastic infirmaries included many landscape designs to facilitate the spiritual healing process. The infirmaries were located adjacent to a central courtyard, allowing patients to connect with religion. The construction of monastic hospitals required that lawns and garden areas be designed for recreational activities for patients and staff. The complex included infirmary buildings designed for patient care, facing the outside and providing access to the inner courtyard. At the heart of the monastic garden was a prominently positioned healing fountain to enhance the overall therapeutic ambiance like the monastery St. Gall in Switzerland. In this particular example that seen in Figure 21 number 36, there was an area where they grew plants that they could use for treatment. In this way, people could both relax by doing garden work and use the garden for herbal medicine production.

Participants: St. Bernard
Case Study: The Judy Black Garden in Cuxa Cloister, St. Gall in Switzerland



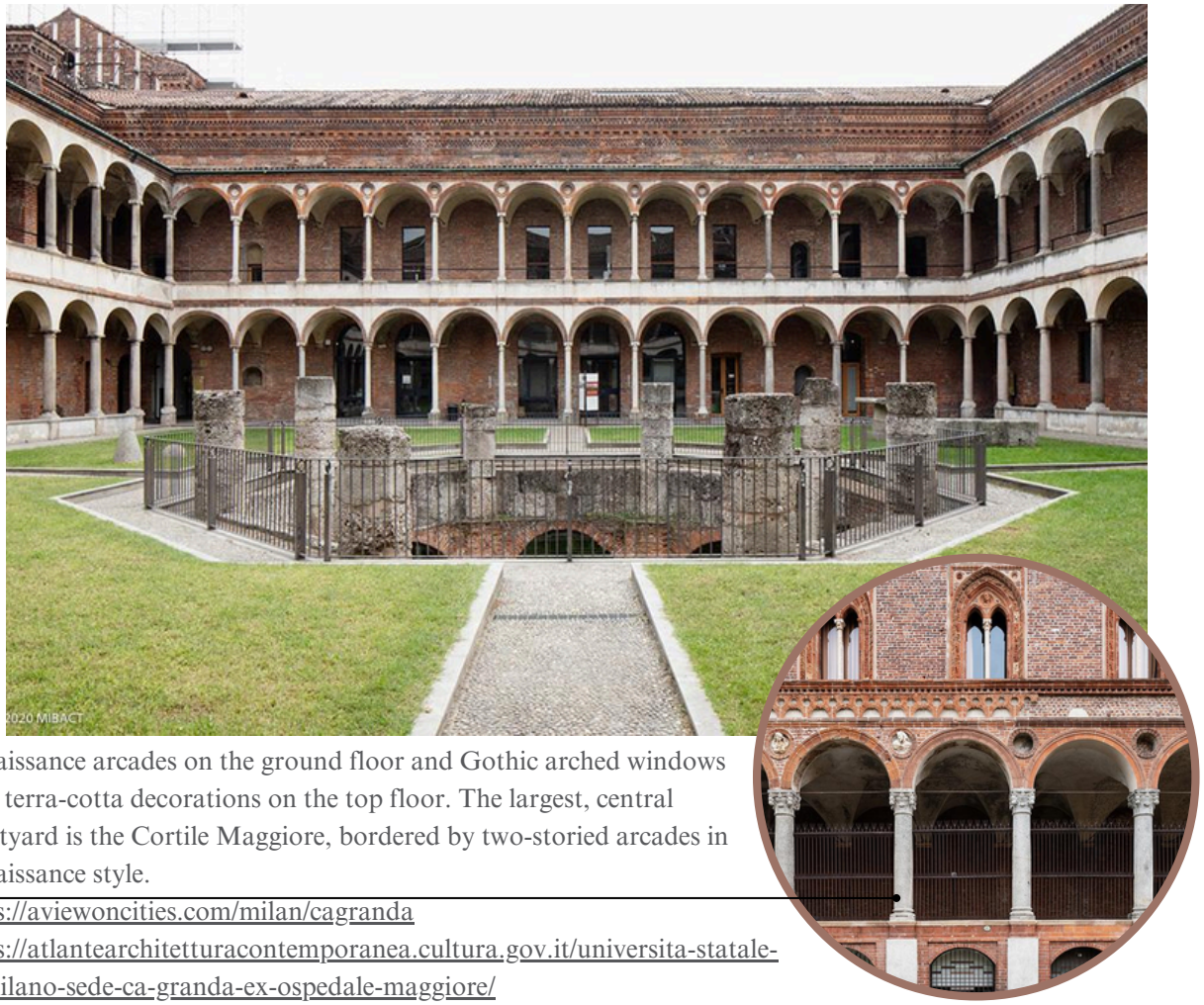
(Fig.21): Ground Plan of a Monastery (St.Gall, Switzerland)
https://thegardenhistory.blog/2019/08/31/the-perfect-monastic-garden/
https://www.shorthistory.org/middle-ages/medieval-gardens/,Edited by Nilay Yasar
Green Areas: 3:Cloister of the Monks, 17,18,19,20,21,22: Pens and barns 31:Vegetable Garden 32:Cementary and Orchard 36:Medical Herb Garden

4.3) RENASSAINCE

In the period of the Renaissance and Reformation, designs for health resorts ignored this culture and the healing power of the garden. Also in the history of the hospital, in this era people were preparing for a new awakening. Science was slowly coming to the fore instead of garden designs in hospitals and the healing power of the garden. An exception to this trend occurred in a mental hospital in Zaragoza, Spain. Regular work was started together with garden therapy as part of the patients' therapeutic regime. The patients' treatment included tending to the hospital's farm of vineyards, gardens and orchards, and these activities were more powerful for their mental health than the violent therapies that mental patients had previously received. This was recognized by the late eighteenth century, and the long-term

success of this innovative approach to patient care became highly regarded in Europe. Another exception was another hospital in Italy, which was spread over a very large area with a green area layout and a "cortile maggiore" section. In Italy, the forerunner of the Renaissance, the Ospedale Maggiore, designed by the architect Antonio Averulino, was built in Milan in 1456 and is considered an innovation because it was designed for a more specific function than a religious hospital. The Maggiore was the first hospital to be structured in accordance with the geometric design principles of the Renaissance.

Case Study: Hospital in Zaragoza Spain, The Ospedale Maggiore in Milan Italy



Renaissance arcades on the ground floor and Gothic arched windows with terra-cotta decorations on the top floor. The largest, central courtyard is the Cortile Maggiore, bordered by two-storied arcades in Renaissance style.

https://aviewoncities.com/milan/cagranda

https://atlantearchitetturacontemporanea.cultura.gov.it/universita-statale-di-milano-sede-ca-granda-ex-ospedale-maggiore/

4.4) MODERN AGE

4.4.1) Healing Gardens in 17th and 18th Centuries

Looking at the developments in the garden-hospital relationship in the 17th and 18th centuries, Louis XIV is known for building veterans' hospitals, such as Les Invalides in Paris, which included an open space where patients could enjoy sunlight, fresh air, and regular exercise. Les Invalides was a military hospital and hospice that could accommodate four thousand patients, and the building was designed that patients' rooms overlooked one of fifteen garden courtyards, which indicates that the architect of Les Invalides, Liberal Bruant, intuitively thought of natural landscapes as beneficial in the health environment and that

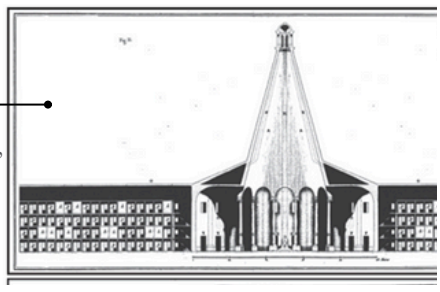
patients were positively affected by the visual aspect of the garden as a way of healing. This approach to patient care and the design of the physical form of the health environment was reminiscent of the courtyard monastery hospice of the medieval period. *Prior to the period of Enlightenment, hospitals were often overcrowded, dark and unsanitary with very little ventilation. These unfavorable conditions led to the acknowledgement of the importance of preludes to healing: views of nature, fresh air and sunlight. Society in general became less interested in contemplating the fate of the soul and more interested in the human condition.*

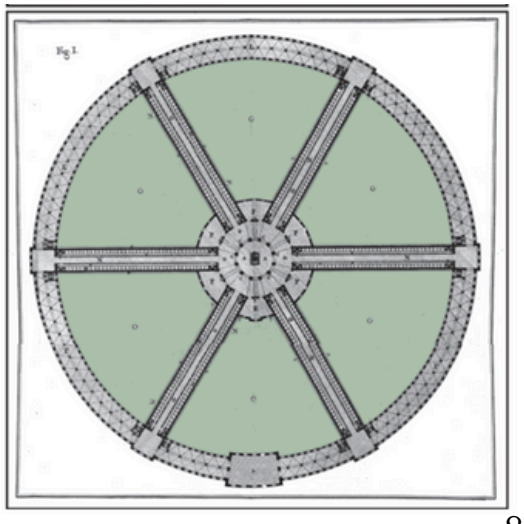
Debra Barnes, *Healing Gardens in Healthcare Facilities: Linking Restorative Value and Design Features,* 4.

The French physician Philippe Pinel and the philanthropist Quaker William Tuke of England thought that psychological support would be better for the mentally ill than the physical punishment that was being applied at the time, and this new approach was also appreciated in Europe and North America. Pinel and Tuke believed that patients should be encouraged to behave positively and socialized in a relaxing environment, and that physical punishment would not be necessary. Patients were given routine activities according to their symptoms, and this successful recovery regimen encouraged participation in gardening and farming. After this action, the landscape environment became an important element of patient care in the treatment of mentally ill patients.

A particularly interesting case study from this period is the Paris Hotel-Dieu building, which functioned as a hospital and is shown in the Figure 22. The architect Antonio Petit proposed a radial plan to promote ventilation and healing, and the landscape surrounding the hospitals served the patients. The main functions of the healing garden during this period were to facilitate air purification and indoor ventilation.
Radial Planning provides healthcare professionals with the ability to easily distribute from the center to patient rooms and control patients, and can be associated with better work efficiency. It also enables hygienic distribution between patient sections with the "wing" system distributed from the center. Since all rooms have a wall facing the outside, it offers the advantage of daylight and ventilation.

Participants: Louis XIV,Liberal Bruant,Philippe Pinel, Quaker William Tuke, Antonio Petit
Case Study: Les Invalides in France Paris, Hotel-Dieu in France Paris





(Fig.22): Paris Hotel-Dieu
José Laborda,
"Conocimiento e invención"
2018, 147
Edited by Nilay Yasar

4.5) LATE MODERN AGE

4.5.1)Healing Gardens in 19th and Early 20th Centuries

In the 19th and early 20th centuries, pavilion style hospitals, mental hospitals and sanatoriums were built, inspired by the work of health revolutionary Florence Nightingale. Her ideology in 1853 for the healing power of nature is as follows:

Second only to fresh air…I should be inclined to rank light in importance for the sick. Direct sunlight, not only daylight is necessary for speedy recovery. I mention from experience, as quite perceptible in promoting recovery, the being able to see out of a window, instead of looking against a dead wall, the bright colours of flowers…it is generally said the effect is upon the mind. Perhaps so, but it is not less so upon the body on that account…while we can generate warmth, we cannot generate daylight.

Debra Barnes, *Healing Gardens in Healthcare Facilities: Linking Restorative Value and Design Features*, 8

Following this idea, the pavilion hospitals of the nineteenth century began to be studied more thoroughly. Hospitals were designed with large windows to allow plenty of light and air to circulate between the narrow wards. The open space between the pavilions provided facilities for patients to view and care for the garden, which included horticultural therapy. Surgeon Jacques Tenon (1724–1816), who was commissioned in 1785 to make recommendations for the improvement of Paris hospitals during the reign of Louis XVI, and his colleagues' principle were to make a hospital a place of healing rather than a place of charity.

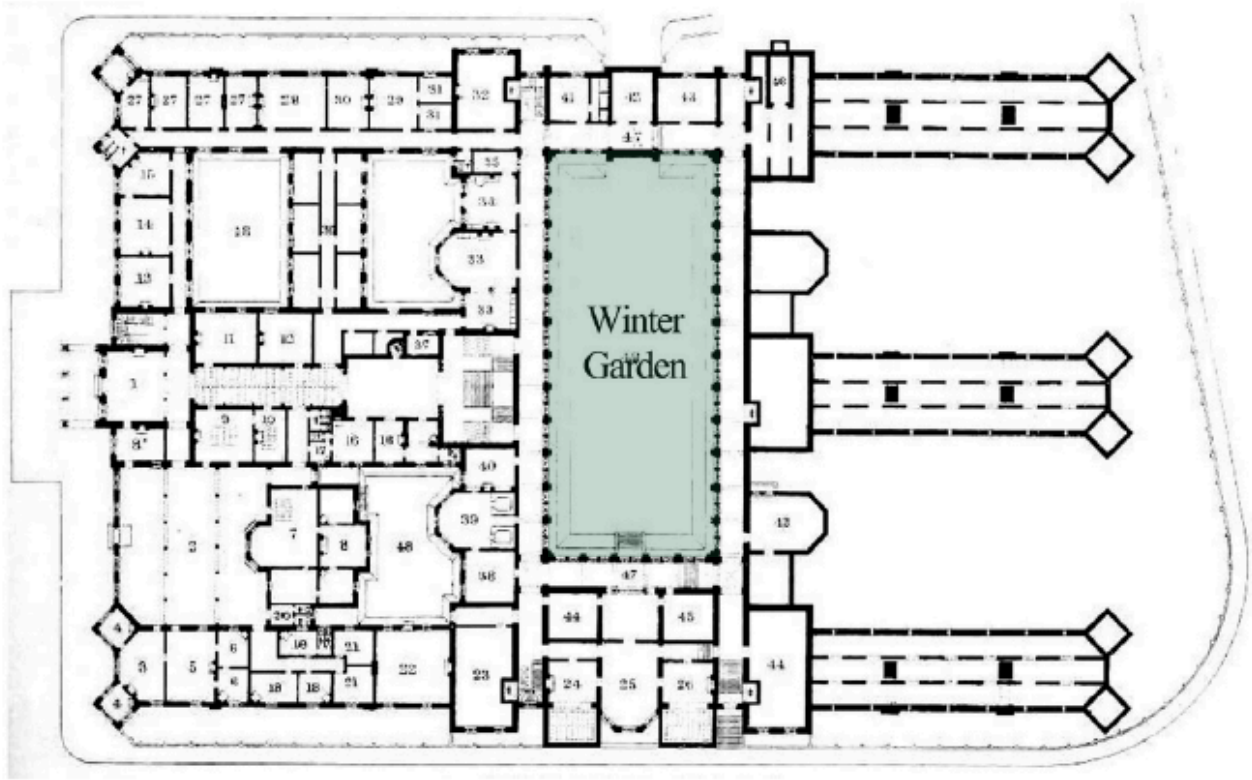
On the other hand in Germany, gardening theorist Christian Cay Lorenz Hirschfield said the following about hospital space and garden design, exemplified by the nineteenth-century hospital:

A hospital should lie open, not encased by high walls. The garden should be directly connected to the hospital, or even more so, surround it. Because a view from the window into blooming and happy scenes will invigorate the patient, also a nearby garden encourages patients to take a walk…The plantings, therefore, should wind along dry paths which offer benches and a chair… A hospital garden should have everything to enjoy nature and to promote a healthy life. It should help forget weakness and worries, and encourage a positive outlook…The spaces between could have beautiful lawns and colourful flower beds…Noisy brooks could run through flowery fields, and happy waterfalls could reach your ear through shadowy bushes. Many plants with strengthening aromas could be grouped together. Many singing birds will be attracted by the shade, peace, and freedom. And their songs will rejoice many weak hearts.

Debra Barnes, *Healing Gardens in Healthcare Facilities: Linking Restorative Value and Design Features,* 10

A typical example of this period pavilion hospital layout is the courtyard and surrounding countryside view from the patient rooms at Riverview Hospital in Coquitlam, British Columbia. For centuries, residents of this mental health facility volunteered their time and labor to establish and maintain the gardens of hillside site known as Colony Farms. While they often used occupational and agricultural therapy to treat their patients, they also entertained the gardens as a pleasant environment for fresh air, exposure to sunlight, and healing exercises. The increase of healing which therapy was provided depended mostly on the illness of the patients.

In the end of 19th century and beggining of 20th; one example of green spaces in hospitals that very important is the conservatory at Leeds General Hospital in England. An indoor winter garden filled with plants, this garden improves air quality by removing toxins and providing clean oxygen. The combination of light, plants and fresh air creates a therapeutic space for patients to escape from the clinical environment, and not only does it benefit patients, but also visitors and staff.



Winter Garden of Leeds General Hospital in England.
Liheng Zhu and Javed Shah Sarah, "History and Evolution of the Healing Gardens: Investigating the Building-Nature Relationship in the Healthcare Setting," 5
Edited by Nilay Yasar

Instead, the beginning of the 20th century was the starting of laboratory medicine, along with more intangible values with the emergence of medical and scientific breakthroughs alongside the rise of tall building construction; the healing garden pavilion-style general hospital was also threatened as we have seen in the hospital evolution. Efficiency experts, attracted by the economic advantages of high-rise hospitals, allowed gardens to be just sterile interiors and so endangering the psychological well-being of patients. It was believed that care and medical supervision could only be effectively provided by "scientific" methods within hospital walls. Eventhough the priority was kind of changed from the gardening to construction; still the greenary was important and after World War I, gardens reemerged as a healing element in the design of healthcare spaces. As such, healthcare facilities included gardens and gardening as a way to promote healing. Veterans' hospitals were built with extensive lawns and garden areas considering architectural interior-exterior relationship. During this period, garden volunteers provided horticultural training to patients to assist with therapy.

Another health issue that affects garden and hospital architecture is in the first half of the 20th century, the treatment of tuberculosis which a life-threatening disease, in sanatoriums involved moving hospital beds to balconies, terraces or attics, as in Aalto's sanatorium, so that patients could regularly receive fresh air and sunlight. Tuberculosis sanatoriums were often located in pine forests because this landscape setting was thought to be important for patient well-being and improved chances of recovery.

Participants: Florence Nightingale,Surgeon Jacques Tenon, Christian Cay Lorenz Hirschfield
Case Study: Royal Chelsea Hospital in London, The Stonehouse Royal Naval Hospital near Plymouth, Riverview Hospital in Coquitlam British Columbia, Leeds General Hospital in England, Aalto's sanatorium

4.6) CONTEMPORARY AGE

After 1945s of the contemporary age, although economic concerns tried to replace gardening with soulless hospital designs, diseases constantly emphasized the need for gardens and open spaces. Experiences were quickly forgotten and economic concerns resurfaced when the diseases were over. And so from about 1950 to 1990, the therapeutic value of access to nature virtually disappeared from hospitals in most Western countries. Air conditioning replaced natural ventilation in high-rise hospitals, outdoor terraces and balconies, and the elements of nature were replaced by cars and parking lots. However, the emphasis on gardens and economic concerns regarding to the context of hospital design have continued to be two interrelated concepts.

In the late 20th century, with the international revival of interest in therapeutic gardens in the health field, the words "healing" and "treatment" were distinguished; healing was defined as improving a patient's physical and emotional state, and treatment was defined as focusing on treating the symptoms of an illness or disease. This created an important distinction for discussions on the therapeutic benefits of gardens and nature for healing. Meanwhile scientific hospitalization focuses on healing disease, healing is a holistic approach to illness and disease that acknowledges and responds to the connection between the mind and body.

Maggie's Center in Dundee, designed by architect Frank Gehry and opened in 2003, features a "Labyrinth grassland," a secluded area with varying points for walking and resting, and a "Walking Path Forest" that offers a peaceful setting for physical activity and rest. Large shade trees provide shade, while benches along the path provide rest areas. Another healthcare example from this era that includes healing gardens is REHAB Basel in Switzerland, a renowned rehabilitation center specializing in spinal cord and brain injuries, which integrates its design with the surroundings and interior courtyards to enhance the therapeutic environment.

Case Study: gardens in the San Francisco Bay Area, St. Vincent's Hospital Cancer Center, Santa Fe, New Mexico; Good Samaritan Hospital, Portland, Oregon); The American Society of Landscape Architects (ASLA), Maggie's Center in Dundee, REHAB Basel in Switzerland

Maggie's Center in Dundee, designed by architect Frank Gehry
https://www.arabellalennoxboyd.com/projects-private-gardens/maggies-centre-dundee

4.6.1) Why "HEALING GARDEN" In Contemporary Age For the "SPINAL CORD INJURY (SCI)?"

Following that in the early 1990s, a movement called Patient-Centered Care was spurred in the United States, where hospital administrators became aware of the negative reactions to the prevailing institutional environment and emphasized the need to give greater attention to patient needs. Studies, primarily conducted by Ulrich in the 1980s and 1990s, found that nature had positive effects on health outcomes. Consumer surveys of former hospital patients, varying by age, location, and medical condition, found that access to nature; gardens -indoor plants, nature pictures, balconies- was the most common preference for the physical environment of healthcare. Two studies that asked people where they chose to go when they were feeling stressed or upset found that the majority chose to go outside to a nature and/or gardens. People appreciated garden elements such as grass, trees, flowers, and water features and reported a positive change in their mood after spending time outdoors.

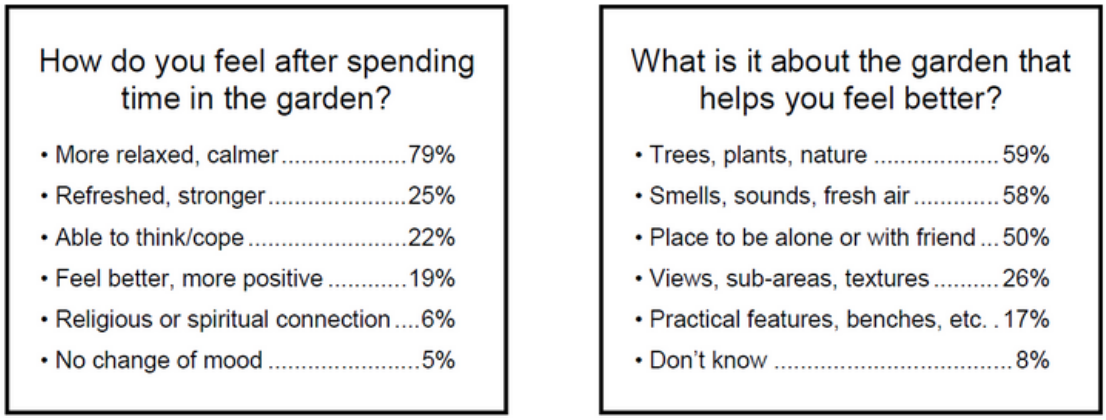
The first organized Post-Occupancy Evaluation study of hospital gardens in the United States was conducted in 1994, using visual analysis, behavioral mapping, and user interviews of gardens in the San Francisco Bay Area. Individuals cherished traditional garden elements such as grass, trees, flowers, lawns and water features; 90 percent of garden users reported a positive change in mood after spending time outside. Feedback from users indicated that the gardens were a direct contrast to the experience of being inside the hospital, and that they provided a sense of well-being by connecting with nature and distracting them from the anxiety, illness, and death that come with the hospital environment. Typical responses from garden-users included:

"My level of stress goes way down… I return to work refreshed."

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

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

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



Responses from 143 garden users at four San Francisco Bay Area hospitals

Clare Cooper Marcus, *Healing Gardens in Hospitals* (Berkeley: University of California, 3.

By the late 1990s, awareness of outdoor spaces in nursing homes and hospitals had grown, and books were being published on how to transform a home garden into a healing space. Hospital patients and staff began to lobby for the creation of usable outdoor spaces (e.g., St. Vincent's Hospital Cancer Center, Santa Fe, New Mexico; Good Samaritan Hospital, Portland, Oregon); and the American Society of Landscape Architects (ASLA) began to support sessions on healing gardens in several formal meetings.

In 2003, the Chicago Botanical Garden School was the first school launching the U.S. post-graduate Health Garden Design by emphasizing the impact of healing design on health and giving courses to educate landscape architects who wanted to pursue in the field.

Healing garden in a hospital revolves around making patients and staff feel better which can be designed for both indoor and outdoor spaces. For an area to be defined as a "garden," it must include authentic natural elements such as plants, green vegetation, water, and similar features. Through the idea of a garden, helping to restore damage caused by stress, anxiety, or depression, and thereby creating a positive impact. Regarding that damages and the examples of these stressful aspects of hospitalization include; upcoming surgery, pain, and unknown diagnostic procedures, loss of privacy, lack of informations, bureaucratic activities -such as dress code and visiting hours- the constant state of being hospitalized and the work activities of employees; but also unmanageable environmental situations such as noise, temperature and light. These situations also affects all patients, their relatives, and hospital staff which are also facing with patient deaths, heavy workloads, and unplanned shifts that create stress. The hormones have multiple effects to adrenaline and noradrenaline, including stimulating the heart and tightening blood vessels. Determined high blood pressure caused by chronic stress causes persistent high blood pressure, or hypertension. When a stressed patient stops taking their medications, breaks their diet, or misses doctor's appointments, serious adverse health consequences often occur. Stress symptoms, such as central nervous system arousal and high levels of stress hormones, have significant effects on immune system task.

A term to know about healing gardens is "health outcome", which refers to a patient's condition or state of progress. Like the discussed effects of nature on health, in both real and imagined, the effects of the healing garden are similar; which means also healing gardens has the impact on relieving depression and pain, balancing blood pressure, reducing the amount of medication taken and the length of hospital stay. Moreover, there is one aspect of healing gardens that is of particular interest to spinal cord injury patients; it has the power to have an effect on motor functioning, as well. Cooper Marcus and Barnes' research conducted by interviewing four health gardens in California shows that, according to patients and staff; the relevance of a stress centered theory of the healing process and stress relief provided by healing gardens was by far the most important benefit; due to the sense of control by accesing to privacy, physical activity and exercise areas which may supply physical rehabilitation, and

positive distractions by plants flowers, waters, natural sounds; provided by being in access with nature which are also factors that are foremost related with spinal cord injury patients. In order to truly accelerate the recovery period of SCI individuals, it means not only improving mentally but also physically in terms of muscle strength; healing gardens should provide an environment that will not only for relaxation and mental restoration but also encourage the patient to do physical activity and so the activity will also bring mental improvement naturally. Inevitably, designers can use the garden as a tool to encourage exercise. Since gardens are perceived as much more pleasant environments than most healthcare wards and treatment areas, if they can be designed and sited to serve as positive navigation destinations that encourage increased patient walking and wheelchair mobility, this can encourage exercise by encouraging corridor navigation that will promote physical rehabilitation as well as emotional healing for the patient. By intertwining with nature; SCI patients who grow plants; the enjoyableness of walking areas in nature and physical therapy; will provide the dynamic interaction of the patient and nature and contribute to the recovery period by providing mental clarity. Psychological benefits of both aerobic and non-aerobic exercises, such as weightlifting, that SCI patients do to strengthen their muscles are so strong that they are widely used to help depressed patients. In fact, it has been suggested that regular exercise is as effective as any form of psychotherapy in reducing depression. Although ergonomic measurements will be explained in further; necessary to mention that every element of the healing garden must be designed by considering an individual with SCI. The patient's accessibility to the garden components must be reachable and user oriented, including the stretcher of the patient while receiving the electric threatment or physical exercise treatments. Meanwhile, the crucial principle of healing design is to provide enjoyable and safe movement especially with a wheelchair in order to be accessible and to provide the comfort of independent action in the area.

Consequently, healing garden to be close to the SCI patient's room and to be in an easily accessible area are essential. Considering the research conducted as yet, the healing garden can be used as an exercise and rehabilitation center which has a positive effect on mental health, and the layout of the healing garden should be close to the patient's accommodation for the reason of transportation accessibility; since the positive effect of the healing garden on the healing process cannot be ignored, respect to giving reasons; making the healing garden the room itself can also have a positive effect on the SCI patients' healing process. In addition, as explained under the heading of SCI, these patients face various problems such as circularotary system, genitourinary system, neuromusculoskeletal system, respiratory systems and experience pain and skin problems; they are even more vulnerable. To give an instance, while an outdoor healing garden can treat cancer patients, it may not be the same suitable for SCI because these patients cannot fully use their motor skills and do not have the ability to fully defend themselves. Natural conditions outdoors can be a problem for them; for instance if an insect landing on the arm, SCI patients may not get rid of it.

From the other perspective, designers should be warned to avoid garden design approaches that encourage social interaction so strongly that they prevent access to privacy. Garden arrangements that force social contact but deny privacy will often undermine control, be viewed as crowded and unattractive, create stress, and therefore be underused. In this context, come into sight that a enormous percentage of people use gardens in healthcare facilities to seek privacy or solitude. This supports the idea that the healing garden should actually be part of a room which is not just the design of any healing garden for SCI patients; but a real healing space that takes their every condition into account, a garden hospital room where they can socialize and also provide privacy. Since it is essential for this healing garden to provide a physical movement and exercise area for SCI patients; another psychological reason for the importance of a private area for SCI patients and the fact that the area should be indoors is that SCI patients will not feel like ‘’they are being watched’’. Even if SCI patients do their rehabilitation activities indoors and socialize, the patients who will see them while doing that activity will not be someone passing by in the way; but instead will be another patient with SCI which may help them to feel safer. During the treatment period of SCI that has been mentioned, walking areas intertwined with nature and natural light that can provide walking rehabilitation activities should also be designed to proctect the patient in dangerous cases such as loose of control, falls and other possible unexpected situations which is easier to control the situation within indoor condition. A healing garden designed indoors will also keep the patient away from the noise and chaos of the urban city and the possible health-threatening smell of cigarette smoke that can be encountered outdoors.
In addition, the concept of a hospital is not a place seasonal; which means it does not offer patients the possibility of treatment only at certain times of the year but always. Regarding to my theory, the healing garden must be considered as a hospital rather than a garden, which requires us to use the space as full-time of the year. The garden, which will be outdoors, will create restrictions on use in case of adverse weather conditions or possible confinement. Patients will not be able to receive therapy in this garden in cold, snowy, windy weather, and moreover, it will present difficult conditions for patients with SCI, as muscles will shorten in cold weather. Designing the healing garden indoors, especially when considering patients with SCI is a wiser strategy for accelerating the healing process.

It is also important to mention before for the proposal project that is the last part of the thesis that, as investigated in previous case studies that has been examined; the Europe pays attention on healing garden ideology not only integrating the idea into hospitals as seen in Aalto's sanatorium in Finland and looking the recent era, the building constructed with the belief in the effect of nature on healing by Nord architects in Denmark; but also by the investigations as the works of evidence base researcher Ulrich from Sweden university. Needless to say that there are many more examples also in Italy as shown in the table Figure 23, notably amount of hospitals accept and take care of the necessity of "healing" within ‘’curing’’. In the Ospedale San Camillo, Lido di Venezia shown in Figure 24; the disabled patients are also improving their motor skills.

	CITY AND COUNTY	NAME OF THE STRUCTURE	TREATED DISEASE	OPENING YEAR	AREA	CHARACTERISTICS	DESIGNER	MEDITERRANEAN CLIMATE CSA: CLIMATIC REGION
1	Montaione (FI)	Retirement Home "Villa Serena - Alzheimer Garden	Alzheimer	1998	700 mq 58mq/ inpatient	First Alzheimer Tuscan Garden, vegetable garden, gazebo, pergola, lawn.	Giovanni Roselli	mediterranean
2	Quattro Castella (RE)	NSD County Asl of Reggio Emilia - Retirement Home San Giuseppe - Progetto Arcobaleno	Alzheimer	1998	565 mq	Well delimited open space, with chromotherapic / olfactory path. Spatial perception functional to the patient.	Patrizia Valla	padan
3	Imola (BO)	Garden of Residece "Don Leo Commissari"	Severe mental and motion handicaps	2001	3170 mq	Interaction between guests and garden by the use of plants with strong aromatic characteristics	Roberto Bacchilega Giulia Mazzali	padan
4	Ostia (Roma)	Hospital "Grassi" (ASL Roma D) Department of Mental Health, "Horticultural Garden"	Psichiatric	2003	---	Green space created the assisted treatment with plants, now abandoned	Patrizia D' Abramo	mediterranean
5	Milano	Ex Psichiatric Hospital "Paolo Pini" Project "Garden of Aromas-Free vegetable garden"	Psichiatric	2003	+ 7000 mq	Community garden for horticultural therapy and social reintegration. Processing of medicinal herbs, recycling, environmental education	Il giardino degli aromi ONLUS	padan
6	Narnali (Prato)	Alzheimer Day Hospital Giardino Alzheimer	Alzheimer	2005	2230 mq	Wandering path, vegetable garden, greenhouse, pergola	Centro TESIS	mediterranean
7	Osimo (An)	Retirement Home Fondazione Grimani Butteri – Sensitive Garden	Senile dementia and Alzheimer	2005	2400 mq	Wandering path, vegetable garden, plants and herbs	Patrizia Valla	Middle Adriatic
8	Trieste	The Regional Institute for the Blind Rittmeyer	blindness hypovision	2005	+ 6.000 mq	The garden of touch, sounds, colors, scents, a stream and a labyrinth of movable panels.	Kac" ic" Lidén Landscape Architects	High Adriatic
9	Castel Bolognese (RA)	Charitable Grouped	Alzheimer	2006	2800 mq	Model "Gentlecare", Italian garden, closed path, spaces for wandering.	Patrizia Valla	High Adriatic
10	Carrara (MS)	Oncology Department Hospital – Therapeutical terraces	cancer	2007	2 terraes x 20 mq	Places for cultivation and contemplation, horticultural therapy, therapeutic gardens.	Enrica Bizzarri Franco Pirone	mediterranean
11	Treviso	Pediatric Ward at Hospital Cà Foncello	all	2008	230 mq	Oasis: roof garden, with trees, plants, grass, flowers, to make more serene hospital stay	Umberto Perini e Alessandra Dalle Mule	padan
12	Venezia	Alzheimer Day Hospital – Residenze alle Zitelle – IRE	Alzheimer	2008	1800 mq	Garden multisensory, reminiscence and reorientation of space-time, global reactivation, psychomotor.	Patrizia Valla	High Adriatic
13	Imola (BO)	Medical Center Alzheimer "Casa Cassiano Tozzoli"	Alzheimer	2009	800 mq	Model "Gentlecare", Italian garden, sensory stimulation. The loop trail follows the movement of patients undergoing wandering.	Patrizia Valla	padan
14	Firenze	Meyer Pediatric Hospital	all	2009	2000 mq	Vegetable garden equipped with tanks and nurseries seeds suitable for children	Fondazione Ospedale Pediatrico	mediterranean
15	Novara	Safe Home at Bellinzago – The garden of the Labyrinth	all	2011	oltre 7.000 mq	Historical- sensory path, Green Terrace, physiotherapy path, Garden of Simples, Euclid's Orchard	Meyer O.N.L.U.S.	padan
16	Milano	Company Niguarda Ca' Granda Hospital. Garden of Wind and Light	cancer	2012	1.450 m	Path also covered, children's area, benches. Therapeutic experiential landscaping.	Monica Botta	padan
17	Roma	Regina Elena Institute – Equipped Garden	cancer	2012	2000 mq	Garden for patients who access the day-hospital oncology, with method "Chromoenvironment"	Francesca Neonato, PN Studio	mediterranean
18	Fivizzano (MS)	Oncological Day Hospital	cancer	Aug/Oct. 2012	1000 mq	Pilot study of chemotherapy given in the garden with tensile structures coverage.	Paolo Brescia	mediterranean
19	Lido di Venezia	Scientific Institute for Hospitalization and Care (IRCCS) San Camillo Hospital	neurorehabilitation	2013	800 mq 80 mq greenhouse	Path of occupational therapy, raised pallets.	Associazione ONLUS Amici di Serena	High Adriatic
20	Meldola (FC)	Romagnolo Scientific Institute for Study and Cure of Cancer (I.R.S.T.) - Garden of the Labyrinth	cancer	2013	1930 mq	Passive use: immersion in the green; sensory use: interaction with vegetation through senses; active fruition: activities in the countryside. "Unicursal labyrinth", with single entry and single path to center and exit.	Paolo Sgaravatti, Benedetta Piccolomini	High Adriatic
21	Imola (BO)	Rehab Garden Montecatone	intensive rehabilitation for severe medullary or brain lesions	2014	2500 mq	Spaces for socializing and recreation and specialized dedicated areas	Roberto Bacchilega Giulia Mazzali	padano
22	Roma	Lazzaro Spallanzani Hospital – Hospice, Garden of Meetings	Hiv, terminal diseases	2014	---	Ortho-therapeutic garden	Roberto Bacchilega Giulia Mazzali	mediterranean
23	Troia (FG)	RSA San Raffaele – Garden of Echoes	Alzheimer	2014	400 mq	Horticultural and physiotherapy path made with recycled materials.	-----	mediterranean
24	Milano		all	2014-5	+ 7000 mq	Garden Synergetic with raised pallets. Therapeutic gardens, spaces for horticulture, and space for the garden-therapy. Path of sensory perception through raised beds with blooms of different colors.	Federica Poggio, Chiara Moroni, Alessandro Uras	padan

(Fig.23): Healing gardens in hospitals in Italy

(Fig.24): Ospedale San Camillo, Lido di Venezia,IT

Renata Valente e Clare Cooper Marcus, *Giardini che guariscono: processi progettuali e realizzazioni di ambienti benefici* (Milano: FrancoAngeli, 2021), 182–183.

4.7) CASE STUDIES

4.7.1) Horatio's Garden for Spinal Cord Injury Patients

The concept of a healing garden is increasingly being explored in Europe more and more. Another example that supports this fact is Horation's Garden which aims to support the physical and psychological wellbeing of patients and their loved ones who have had long-term hospital stays by designing gardens that feed into spinal cord injury centres and contribute to the recovery process of patients before and after their injury by adapting the healing garden design to hospitals. Once the powerful effect of the healing garden on patients was seen and proven in hospitals, this idea began to spread around the world and get awards. The staff are specially selected from volunteers who aim to create a more peaceful environment for patients, staff and loved ones. The construction phase was funded by donors and volunteers. The purpose of this garden was explained in the impact report as follows:

"Our aim is to improve the outcomes for people facing life-changing injuries by using an evidence-based approach to transform the environment and enhance the holistic care given in spinal injury centres... As thought leaders, we champion the wider benefits of gardens to health."

In the interviews of spinal cord injury patients who used Horatios Garden as a healing garden. When questions were asked about how they felt about receiving treatment there, the answers of the patients were incredibly positive and the positive effect of the healing garden idea on spinal cord injury was reflected as evident not only by the percentage as shown in Figure 25 but also in the following sentences of patients:

"*Spinal cord injury can happen to anyone, at any time. The results are life-changing and devastating. There is currently no cure for spinal injury. Approximately 2,500 people become spinal cord injured every year, joining a population of around 50,000 people already living with the condition across the UK. On average, patients with spinal cord injuries will spend upwards of two months rehabilitating at a specialist centre. During that time, many will be isolated from their families and friends, often far from home and confined to a ward with little or no access to the benefits of the outside world. Horatio's Garden is changing that."*

This garden, designed for spinal cord injury patients, has been reported by users to be beneficial not only for the patients but also for their friends and family.

*"Peter(*name changed for anonymity) and I are so grateful to have had somewhere to meet that took us away from feeling like we were in a hospital. Horatio's Garden has felt like a lifeline in such a stressful period. We are so thankful for the fantastic garden, cakes, tea and amazing volunteers. It really has made the last seven months easier and helped Peter's recovery enormously."*

Horatio's Garden: Nurturing Lives after Spinal Injury, Impact Report(Salisbury, UK: Horatio's Garden Charity, April 30, 2023), 7–10

Employees also stated that the garden reduces workload and stress, and that they cannot even imagine a working environment without a garden:

"We can't imagine not having the garden now. It has made such a difference for our patients and families. It is an escape outside of the hospital and allows people to just be. The space you have provided has become so important in people's recovery. The staff and volunteers also provide a wonderful resource for patients who gain from all the positive conversations and interactions. Thank you so much for this incredible resource."

Examining the question of what kind of activities are carried out in this garden in addition to keeping the morale of patients, relatives and employees high; seen that in the healing garden, in addition to improving the patients' own freedom and mental health during the day, physical activities are also included. For example, with the " gardening therapy" carried out by the patients together with the volunteers, areas were designed where the patients can grow their own plants; herbs, salad leaves, vegetables and flowers. For some, it offers a sense of purpose and progresses their physical rehabilitation, particularly people's hand function and fine motor skills. Already mentioned in the previous section of the thesis that art has a healing power, and this is a kind of argument that proves the thesis, which shows the art is also included in this healing garden. So that spinal cord injury patients have used art both as a rehabilitation technique for the physical activities and have had the opportunity to realize their own talents.

"The fact this garden has been designed so carefully that there is always something in blossom is inspirational. I enjoy gardening too, as the team plan activities which I can do with my level of hand ability. I always make the most of the greenery and the fact that nature carries on in difficult times."

"I really enjoyed the painting, it was a welcome distraction from a painful day during what has been a dark time. It was also inspiring as it reminded me how much I enjoyed art."

Horatio's Garden: Nurturing Lives after Spinal Injury, Impact Report(Salisbury, UK: Horatio's Garden Charity, April 30, 2023), 17-19

"Horatio's Garden has given me a safe place to go to, either by myself or with my family when they visit. I enjoy going to the garden to do activities with other patients, or to just sit and think when I've got a lot on my mind. It has made me so much happier, especially because I can go out there and be independent."

95%
of patients use Horatio's Garden at least once or twice a week

82%
of patients are aware of the health benefits of using Horatio's Garden

94%
report improved wellbeing from using Horatio's Garden

91%
report improved mental health from using Horatio's Garden

90%
report improved mood from using Horatio's Garden

76%
of patients spend time in Horatio's Garden several times a day, every day or almost every day

(Fig.25) The Percentages of healing and the satisfaction of patients by garden during the cure

Horatio's Garden: Nurturing Lives after Spinal Injury, Impact Report(Salisbury, UK: Horatio's Garden Charity, April 30, 2023), 10-14

4.6.2) 165 REHAB, Centre for Spinal Cord and Brain Injuries

Legend:

Site

Circulation Area &Terraces

Pool

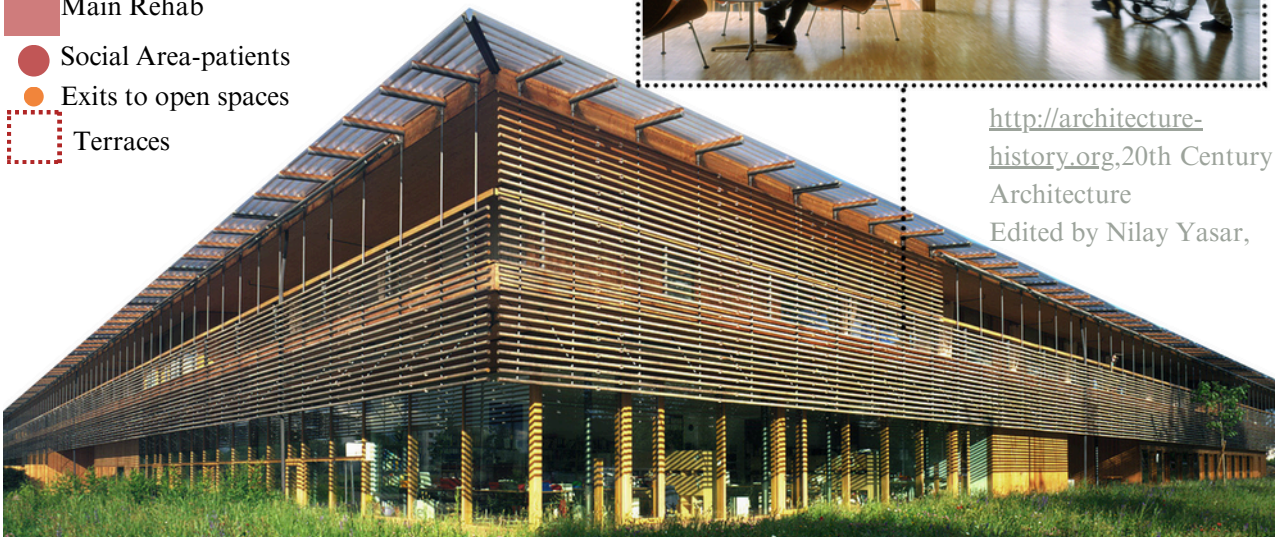
Main Rehab

Social Area-patients

Exits to open spaces

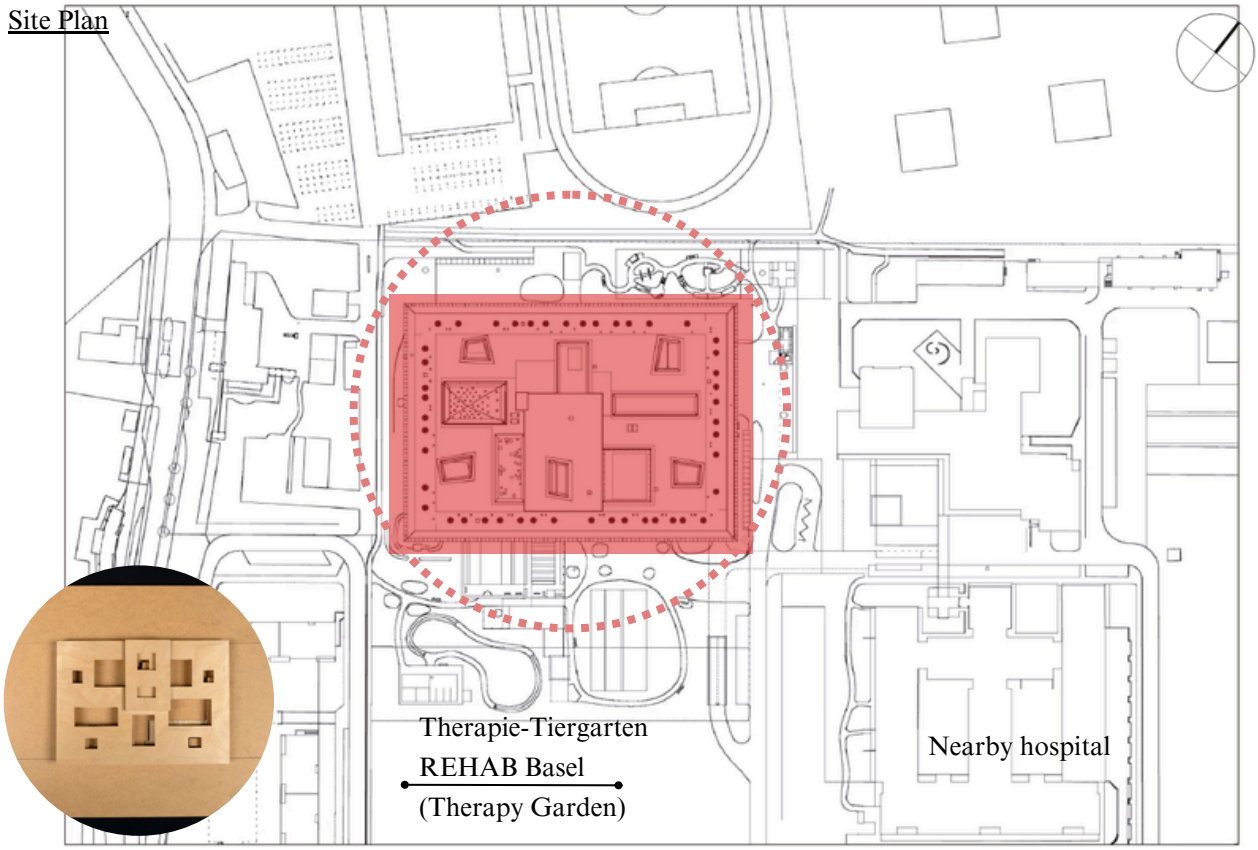
Terraces

http://architecture-history.org,20th Century Architecture
Edited by Nilay Yasar,

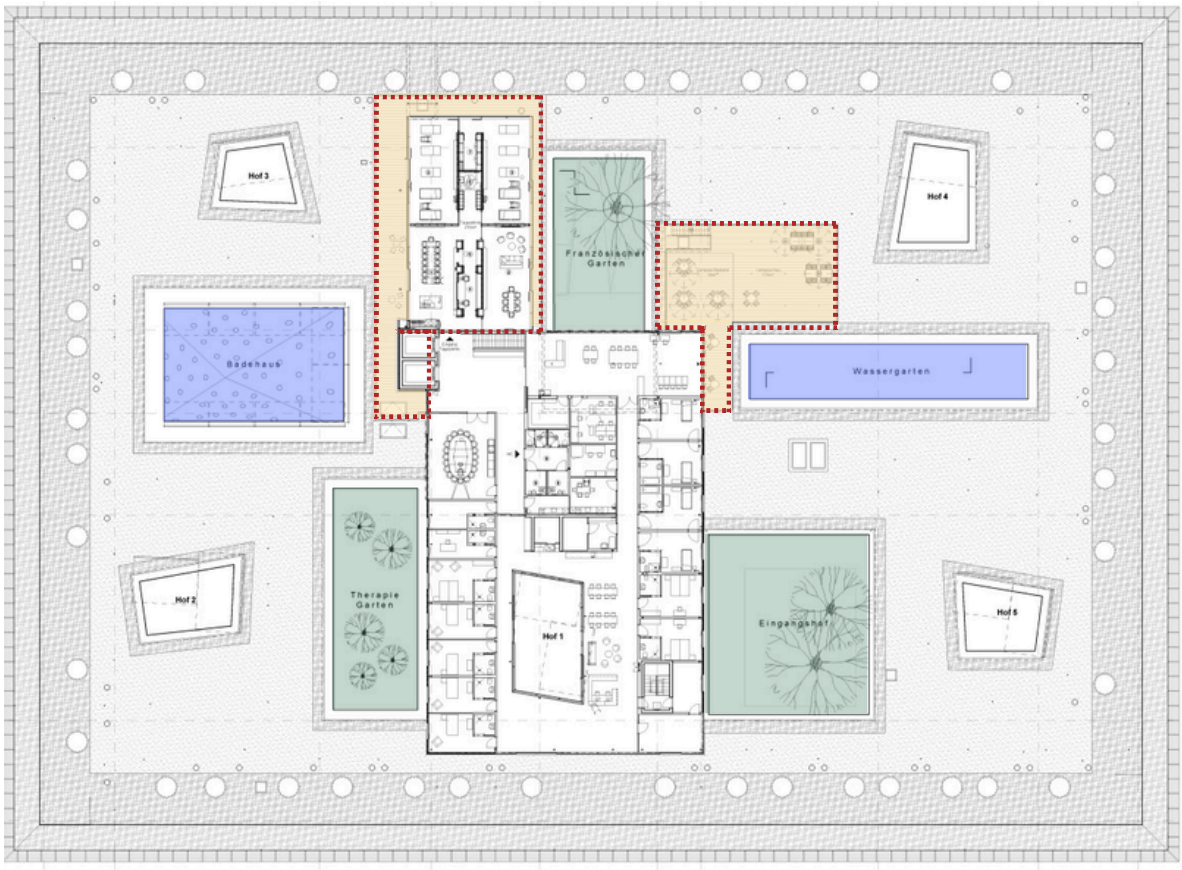


165 REHAB is a Clinic for Neurorehabilitation and Paraplegiology hospital for spinal cord injury patients located in Basel, Switzerland. The hospital was designed by HERZOG & DE MEURON architects after a competition held in 1998 and opened in 2002 then had transformation and extension 2018-2020. It has a floor plan of 9500 m2. From the beginning, the client's wish was "a hospital that does not feel like a hospital". Patients had to stay in hospitals for long periods due to various accidents; the aim was to create an environment where patients could become as independent as possible again and spend their free time with friends and family during the treatment process with therapists and doctors during the day. Having all the routines of a healthy individual; but with one difference that everything happens in one place.For this purpose, the hospital was designed as a small town rather than a hospital which has also a therapy garden closeby. The building has two floors. Therapy and medical areas are located on the ground floor, and patient rooms are located on the upper floor. In the planning, importance was given to the connection between interior and exterior spaces, and the building was shaped around courtyards, allowing natural light to enter every area. Wood is the main material. It was used in different ways on the facades and interior spaces. Designs that protect the privacy of patients, rest and socialize between therapies are available. Large plastic spheres in the patient rooms allow patients to see the sky while lying down. Patients can be moved outdoors thanks to the wide verandas. REHAB center offers a flexible and humane design that responds to patient needs. It stands out as an open and versatile building integrated with nature. A new unit for behavioural disorders (SAP ward) was created in 2018. This was the centre's first turnaround since the building opened. Both the SAP unit on the ground floor and the annex on the roof are naturally integrated into the existing structure.

Site Plan



Roof Floor Plan



https://www.herzogdemeuron.com/projects/165-rehab-clinic-for-neurorehabilitation

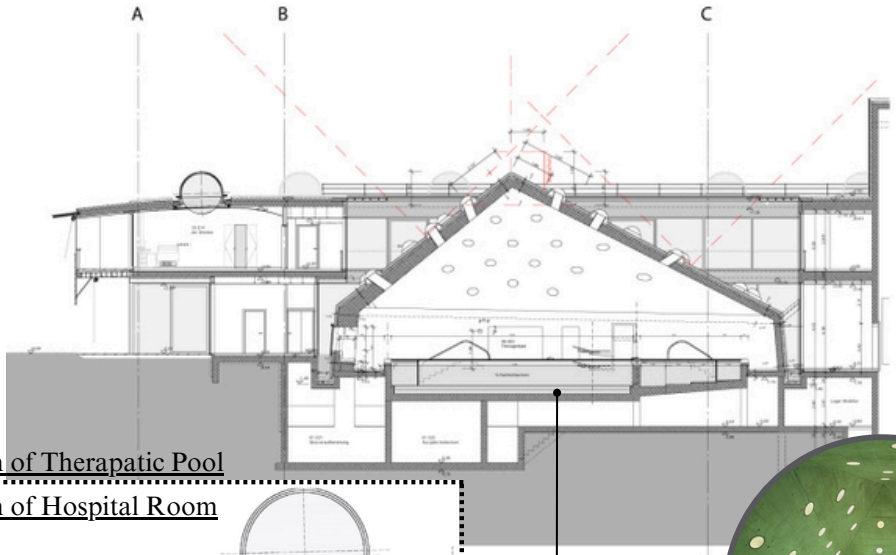
https://arquitecturaviva.com/works/centro-de-rehabilitacion-rehab-basilea .

https://www.google.com/maps/place/Therapie-Tiergarten+REHAB+Basel/

Edited by Nilay Yasar

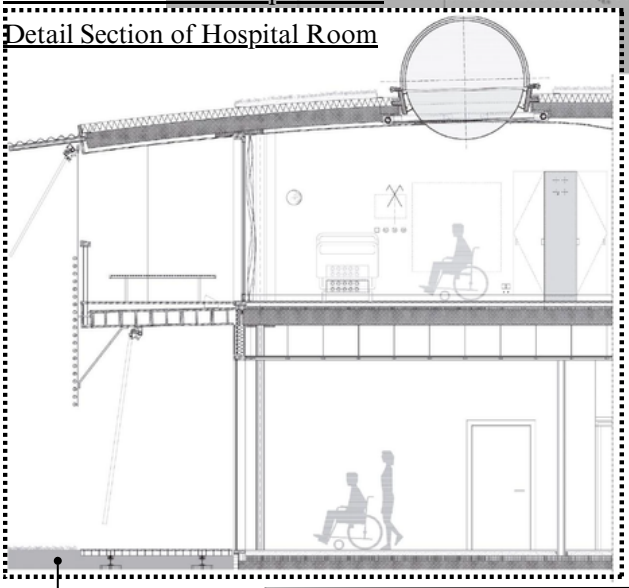
Ground Floor Plan

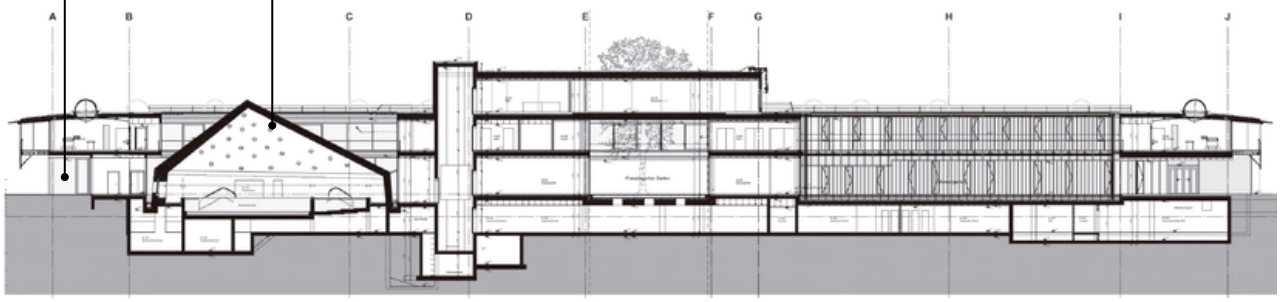
First Floor Plan



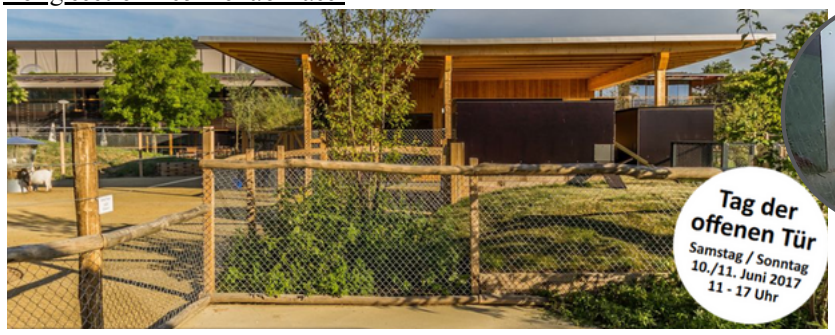
Detail Section of Therapatic Pool

Detail Section of Hospital Room





Long section 165 Rehab Basel



Therapie-Tiergarten REHAB Basel (Therapy Garden)

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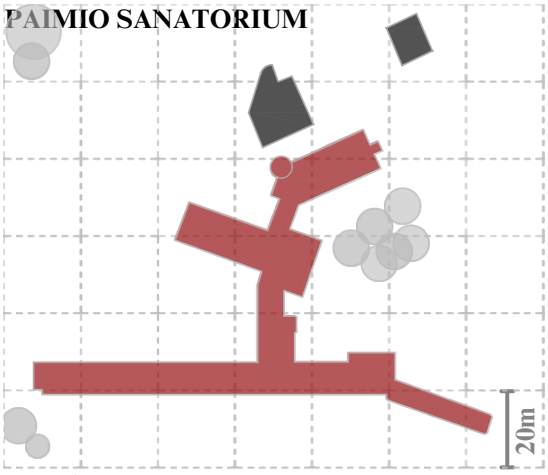
http://architecture-history.org; 20th Century Architecture
https://arquitecturaviva.com/works/centro-de-rehabilitacion-rehab-basilea-10
https://www.herzogdemeuron.com/projects/165
https://archello.com/it/project/rehab-basel
https://www.google.com/maps/place/Therapie-Tiergarten+REHAB+Basel

4.6.3) Comparison of Case Studies

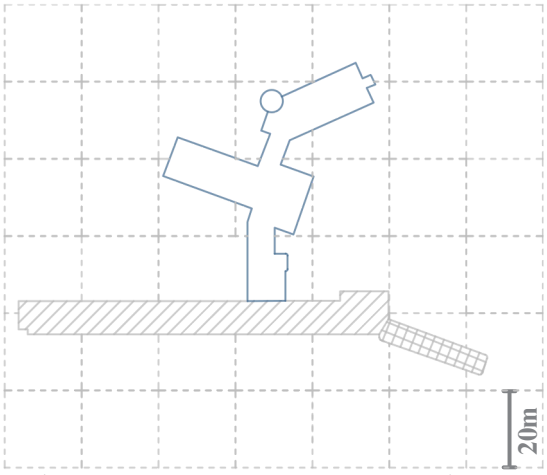
Footprint:

Distributions of Spaces First floor:

PAIMIO SANATORIUM



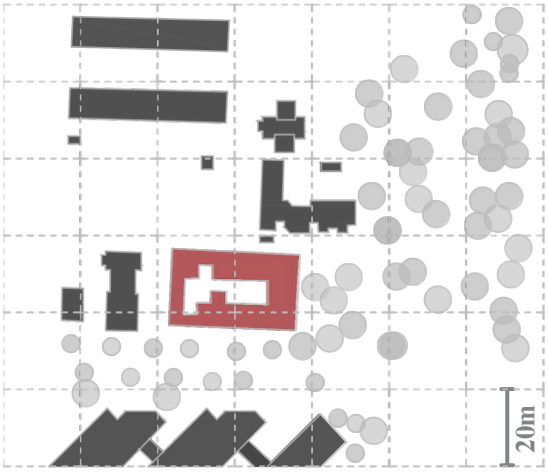
occupies %83,3 on 16,800 m2



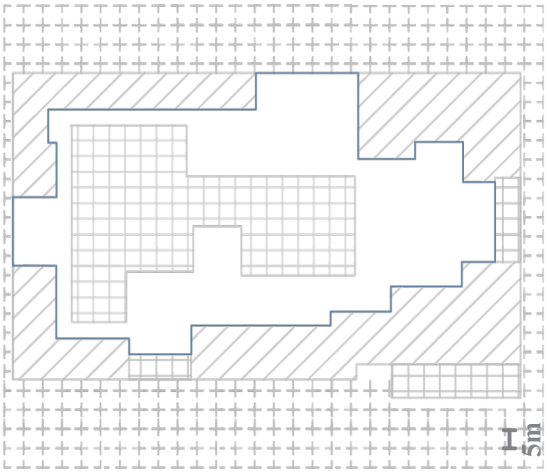
patient care: %42,86 ; terrace: %9,52;others: %47,62

Note: Since from first to fifth floors are repetition, only first and last floors evaluated

CENTRE FOR CANCER AND HEALTH

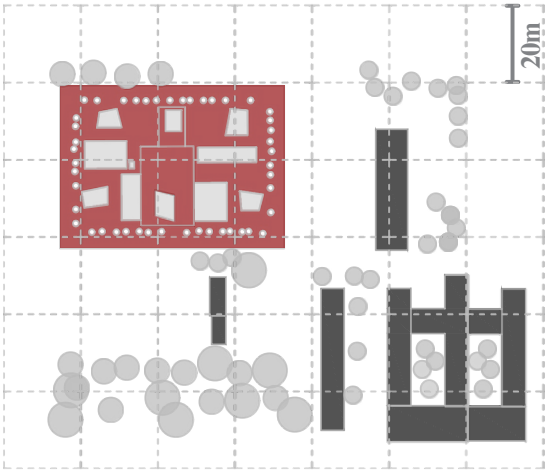


occupies %10,71 on 16,800 m2

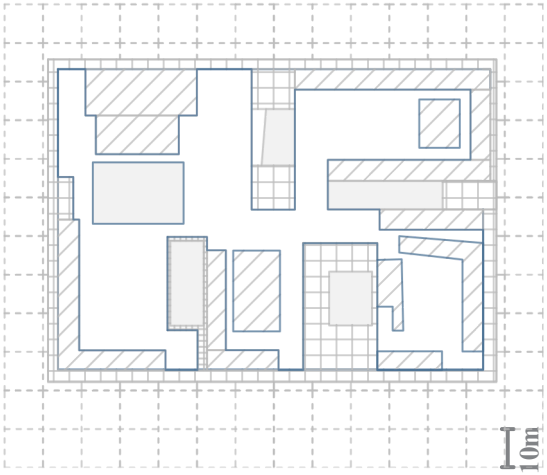


patient care: %36,36 ; terrace: %27,27; others: %36,37

165 REHAB



occupies %56,55 on 16,800 m2



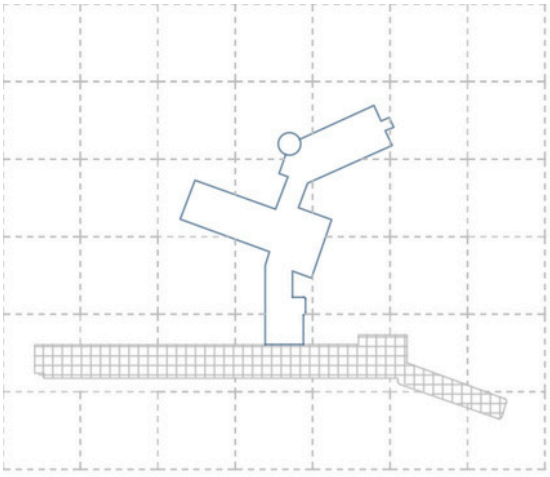
patient care: %26 ; terrace: %24; natural elements: %10; others: %40

related building

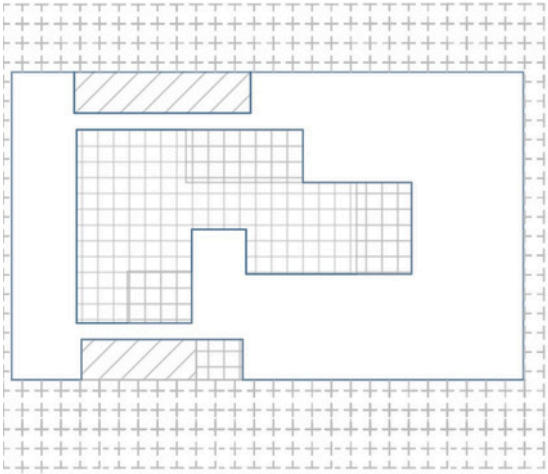
surrounding buildings

Clinical areas

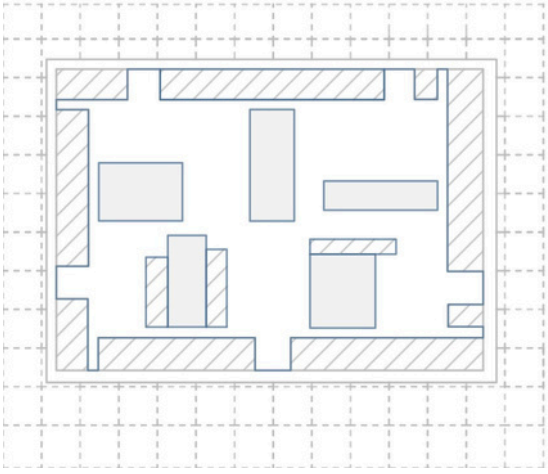
Distributions of Spaces Second floor:



terrace: 52,38 ;others: %47,62

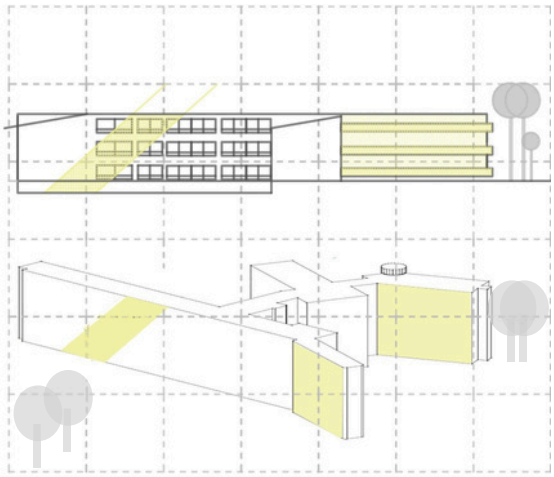


patient care: %9,09 ; terrace: %30.36 ;
others: %60,85



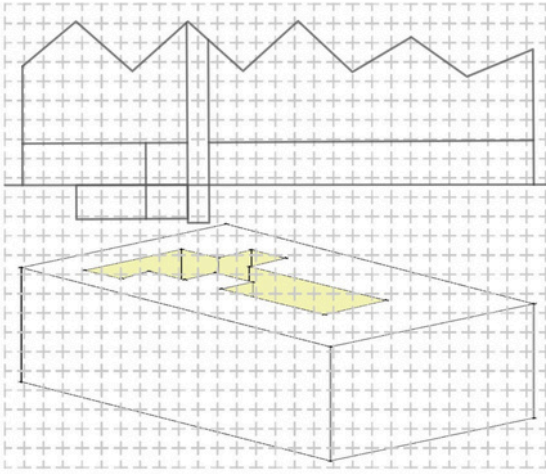
patient care: %32 ; natural elements:%15 ;
others: %53

Relationships with Natural Elements:

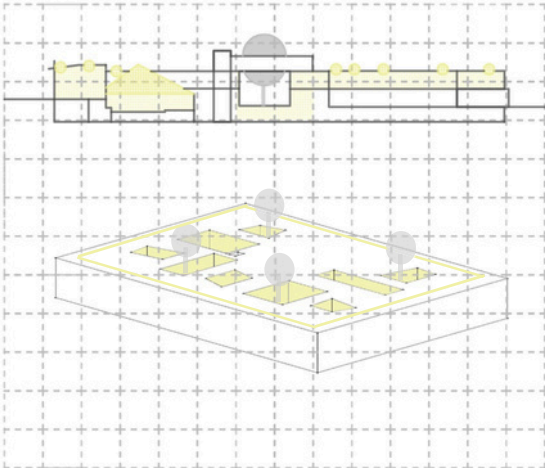


TOTAL: patient care: %35.72 ; terrace:16.6 ;
others: %47.62

Note: All the six floors are considered for the total percentage.



TOTAL: patient care: %%22.73;
terrace:%28.82 others: %47.62



TOTAL: patient care: %29; terrace:%12
natural elements: %12,5 others: %46.50

terrace natural light natural elements

While making the comparison, four main headings were evaluated. The first of these is the patient care area, that is, the places where the patient is intervened; the hospital room and the areas where the doctor is one-on-one with the patient; terrace; indoor and outdoor areas together; natural areas; spaces designed especially for blue and green areas inside the hospital; and finally others; personal doctor rooms, places that the patient and doctor do not spend much time one-on-one but areas that they encounter less, service areas and other medical rooms, and atriums, corridors where there are no terraces but the patient can spend time are all gathered under this heading.

Looking at the comparisons in general, the area with the highest footprint in the same square meter area was Aalto with a rate of 83.3%. In the comparison of Paimio, since the floor plan layout is repeated from the first to the fifth floor as shown more detailed in historical sources of Chapter 2, in the table only first and last floors are given although all floors are evaluated in percentage values. Thus, at the general view, the Paimio project has the largest square meter distribution to the patient care area, but although more than half of the last floor of Aalto's Paimio is designed as a terrace, when we look at the general view, the project that includes the most terraces in these three case studies is the "courtyard" design of Nord Architects, which has the most open space in the closed area.
On the other hand, although green areas are included in both the terrace and the courtyard in all three projects, the only building that allocates space as a design for natural elements in the building itself is 165 Rehab Spinal Cord Injury Hospital.
In percentages, the section allocated to the others section, Paimio and center for cancer and health, share the same percentages with 47.62%, while 165 rehab also has a very close percentage, and the area with the highest percentage in the three health buildings is others.
Finally, at the relationship with natural elements section in the last column, the natural light of Paimio is shown on the facade thanks to the traditional big window and the "sun patios" shown in Chapter 2, Figure 14, the facade where the terraces are evaluated as areas that receive natural light completely. Although elements such as flower pots etc. are placed on the terrace section of this building to green it, the actual natural elements are the natural trees of the mountainous area where the building is located.
Center for Cancer and Health, the natural light is seen with a different approach and a privacy concept meanwhile 165 Rehab is a mixture of these two projects, where natural light can be seen not only facade but also in areas specially designed for natural elements inside the building. In this project, it was also tried to increase lighting with natural light skylights placed on the roof.

CHAPTER 5:
Interview Insights

The last part before proposal project is dedicated to meet with SCI patients and/or healthcare professionals who are related to this specific health problem and to conduct an interview with them in order to understand the hospital environment in an architectural context. First, I had actually prepared this interview only for SCI patients. In order to approach them correctly, we decided to meet with a psychiatrist from Turkiye, Alp Akça (Psychiatrist at Çanakkale State Hospital, Department of Mental and Nervous Disorders) and ask questions as few as possible, simple and open-ended. In this way, aimed to learn their opinions on the subject without mentioning on their traumas. My professor Elena Vigliocco and I added architectural approach to the questions and prepared the questions in three different languages: Turkish, Italian and English. However, many patients were closed to communication and refused to participate in the interview, either verbally or in writing. Therefore, the target audience of the interview was changed with the idea that "not getting an answer is also an answer" and similar questions were arranged to be asked to SCI healthcare professionals.

Interview consists of 3 questions. Professional participants' jobs and their names, SCI patients' names and ages (real information is used) are added to the interview.

I would like to express my heartfelt gratitude to Ethem Levent Polis Physical Therapy and Rehabilitation Specialist, Feray Polis Physical Therapy and Rehabilitation Specialist, Gulgun Gokoglu Physiotherapist, Gianmarco Salvato Physiotherapist, Dilara Gege Physiotherapist, Lorenzo Filippo Psychiatry Resident, Alp Akça Psychiatrist, Tatjana Slijepae Social Health Worker, Murat Altın a SCI patient, Kadir Çakır a SCI patient, Okan Ikizturac a SCI patient; for their participation.

I would like to thank once again to Ethem Levent Polis and Gulgun Gokoglu for their greatest contributions to my personal recovery journey.

The interview that has been prepared as below in English;

The Design Components Of A Hospital Room Aimed At Accelerating The Healing Process of Spinal Cord Injury Sufferings

First of all, I sincerely thank you for agreeing to participate in this interview. As an architect, my goal is to create a more comfortable hospital environment for patients who have suffered spinal cord injuries by designing hospital rooms that can support the recovery process through architecture. It means a lot to me that you can freely express your ideas to contribute to this goal because I understand you—I am one of you. I am making all these efforts for all of us.
Nilay Yaşar, Politecnico di Torino, "MSc Architecture for Heritage", Italy

Name/Surname: Profession:

1)What difficulties do you and your patients encounter in hospital environments during the care process? (Examples: accessibility, limited space, maneuvering difficulties, light switches and object heights; lack of green areas, natural light, circulation in the work environment). What emotions do these difficulties evoke in you?

2)Imagine that hospital rooms are not like the current ones but are designed with a completely different approach to support the healing process of patients. What kind of environment would you prefer to have for your patients?

3)Imagine that the hospital room provides a space where you and your patients can do things you enjoy (for example, growing small flowers). What would you like to do, and how would this experience make you feel?

The questions were prepared with the help of Uzm. Dr. Alp Akça (Psychiatrist at Çanakkale/Turkiye State Hospital, Department of Mental and Nervous Disorders) and Elena Vigliocco (Associate Professor, Department of Architecture and Design, Politecnico di Torino).

According to Ethem Levent Polis, a physical therapy and rehabilitation specialist at the Atlas Medical Center in Canakkale, the difficulties experienced during the treatment process and possible solutions were stated as follows:

"The centers where patients with spinal cord injuries are followed up should be in a separate building and have different features. Being in the same building with patients followed up in different branches prepares the ground for a crowded and noisy environment. The psychological destruction caused by the existing disease in the person can be further increased by an uneasy environment. The rooms should be single-person as much as possible and a suitable environment should be provided for the companion. In a room where more than one patient stays, the psychological trauma that each patient may experience also affects the other patient. The rooms should be large enough for a wheelchair or stretcher to maneuver easily. There should be no threshold, especially on the bathroom and toilet doors." In response to the second question, the room he dreamed of was described as follows:

"I believe that especially in rooms where tetraplegic patients are monitored, the ceilings should be glass (we should ensure that they can easily see birds, clouds, rain and the sky so that they do not lose their connection with the outside world), and that there should be a screen on the ceiling where patients can read books, use videos and many applications with voice commands, which would be important for the patients' morale.

It would be very good for the patients' comfort if there were handles on the walls that patients in better condition could hold onto while mobilizing. In addition, it is very important for the patients' morale that the beds in the rooms of paraplegic patients should face the room's window and that the windows should be along the walls so that the patient can see outside from where they are sitting.

It is also very important for the patients' comfort to have a sufficient number of portable patient lifts in the buildings to facilitate the transfer of patients from the bed to the transfer vehicle.

It is necessary to have a button sensitive to audible stimuli to ensure that tetraplegic patients reach the healthcare personnel on duty, and a button that paraplegic patients can easily reach."

Finally, specialist doctor Ethem Levent Polis offered some ideas for the room of spinal cord injury hospital;

"*A small area suitable for the hobbies of the patients can be created and live flowers can be placed in pots. Objects such as an aquarium or a bird cage where we can feed small pets that convey the liveliness of life to us can be placed. In addition, a warm home environment can be created with 2 armchairs and a nesting table in between, where visitors and companions can be comfortable."*

Feray Polis, a physical therapy and rehabilitation specialist, she said that the difficulty of carrying treatment devices due to the narrow spaces and the distance between them and electrical outlets, the lack of natural light and the lack of ventilation caused problems for patients and staff, and that her dream hospital room was the idea of making the walls of the hospital rooms feel like they were in another environment with the help of a remote control with artificial intelligence programs, and that it would be fun to be on the top floor of a skyscraper, on a safari in Africa or in a room full of fish under the sea. She suggested that he organize book and movie review days with patients who are interested and maybe watch the movies on devices such as computers and TVs placed in the rooms and then chat about the movies, which could be motivating in a hospital environment.

Gülgün Gökoğlu, Physiotherapist, according to her observations; obstacles on the room floor create a tripping hazard and there is no space left to move freely with a wheelchair due to the objects in the room. She adds,
"In addition to problems such as lighting and ventilation, patients have difficulty reaching the call button. It is not preferred to have another patient in the room. There are no appropriate supports for the transition from bed to transfer wheelchairs. In order to transition from a movement and health pattern to a state of dependency; having self-sufficiency, easy access to a health professional, minimizing the risk of falling or injury will make the difficulty of the process feel bearable."

Regarding the completely different approach for hospital rooms, the physiotherapist stated that the room floors should not cause tripping; items such as dining tables, chairs and desks should be integrated into the walls and designed in a way that they can be lifted and so being able to create more space; the possibility of solving the ventilation, lighting and nurse calling processes with a remote control with a smart room system; a room that receives sunlight which is planned to accommodate only one person and one companion if possible; and that if necessary, a room with a movable floor (to areas such as bathrooms and toilets) could be more useful for patients.

"It should have a layout and width where windows with a view of nature are at sitting level, where they can work on the computer or read books, programs to acquire new skills, exercise, watch movies and even chat. Knowing that daily life could somehow continue would make the process easier to bear. Being able to acquire new skills could be calming."

Gianmarco Salvato, who works as a physiotherapist at Il Sorriso, expressed his field of vision on the interview questions along these lines:

"I think that the most important difficulty my patients encountered during their hospitalization was the lack of opened spaces to enjoy sunny day in summer or in general to take a breath in a different space from the hospital. Talking about other things I would say that is pretty good and functional for patients with disabilities. I've always though that even if there would be difficulties for my patients I would have been there to help them to surpass those obstacles.
I'd prefer an environment at patient's measure, I mean that everything would be available for any kind of patients, obviously always thinking about their particular disabilities. I would think about automatic bed that you can control in height, rotation and so on to help them outstanding some mobility problems. I would put in all rooms some grips on the walls to help them standing easily if they can do that and maybe walking using those grip. And in the end I would choose a wider type of access doors to better pass through them by wheelchair.

I would like to experience a normal life, that is something patients usually miss a lot. So a space where they can feel they're just like the other people, going for a walk, so some physical activities like sports or stuff like that (always thinking about their disabilities, so I would personalize them). I think that this kind of experience would makes me feel in a sort of way proud of what they're doing in that moment, because I would think that they've improved so much and I would feel the strong will they have to live a normal life everyday."

Dilara Gege, a physiotherapist, is not satisfied with the time loss caused by the crowd and the elevator and staircase circulations and the general hygiene understanding of hospitals. She thinks that physical therapy rooms should be single-person and more spacious so that the patient can perform the exercises at a more optimal level and thus the patient can focus more on the recovery process. In addition, physiotherapist Dilara Gege added that she believes in the healing power of music in hospitals and that she would be happy and excited to see the piano instrument she plays in the hospital environment, so that the morale of the patients will increase with music and contribute to the recovery process.

Lorenzo Filippo, psychiatry resident says;
"I should begin by saying that I work in both hospital and outpatient settings. In both cases, the presence of old rooms, often poorly lit, evokes negative feelings for both the clinician and the doctor, creating an atmosphere that is not ideal for work. I would like the rooms to be spacious, welcoming, and bright. The patient must first and foremost feel at ease, even before the actual consultation begins. The idea of incorporating relaxing or soothing activities would make the setting less rigid and more functional, both for the patient and the doctor."

Psychiatrist Alp Akça, with whom we prepared the questions, shared his thoughts on the subject as follows;
"First of all, most hospitals do not have a suitable environment for physical therapy. It is a problem for patients to come to the hospital and to reach this area. I think physical therapy areas should be single and so on the ground floor for the accessibility. The number of elevators and their capacity is insufficient. The service should come to the patients, not the patients to the service. Physical therapy times are limited, the number of patients and doctors is inadequate. It is sad that the patients who come are already mentally down and they have to face these problems. Instead, should be given the comfort of home and should not be dragged from place to place for their human needs.

In my dream, there is an area with a huge garden in the middle with single-storey rows of detached houses. These houses open to this huge garden in the middle and there are any activities, sports areas, maybe hot and cold water pools in this garden. Patients can do small physical therapy exercises, sports activities and socialize in this area. They can drink tea and coffee and eat in this area. This area is a beautiful area where the doors of single-storey houses open. Inside the house, ergonomic beds and sinks for the patients should be designed. (or wheelchair-type bathrooms... etc.)

Growing fruits and vegetables is an action that positively affects mental health. However, there should be no restriction of movement while doing this. A lot of work should be done with less furniture. Furniture designed to transform from a bed to a chair or from a chair to a table can also provide the opportunity to create more space in the hospital environment for these activities. In addition, to grow these plants, the room needs to be lighted; just like patients. People are like flowers; they come to life when they get light."

Tatjana Slijepae Social Health Worker, at Istituto Di Montecatone Rehabilitation Hospital states:
"The facility presents several difficulties, especially in relation to the limited space:
The corridor does not allow emergency maneuvers in an easy and comfortable way. The doors are not wide enough to allow the passage of mobility aids for patients. Waste and wheelchairs often do not have an adequate location, hindering the passage of healthcare personnel. The bathrooms should also be designed to accommodate a tub suitable for tetraplegic patients.
Furthermore, a fundamental aspect is overlooked: the patient finds himself having to face the acceptance of a new life condition and a long stay in an aesthetically sterile environment. The lack of spaces dedicated to socialization and personal intimacy further aggravates this condition.

As previously indicated, it is necessary to expand the spaces and provide single rooms for each patient, in order to guarantee greater privacy and a more personal environment. Integrate elements that promote emotional well-being, such as a magnetic board to display personal photos, a musical device to listen to your favorite music. A more careful attention to the design of the environments could have a positive impact on the mental state of patients. You could consider, colored walls to make the spaces more welcoming, modern and functional furnishings, capable of creating a warmer and more reassuring atmosphere.

There is no single solution valid for all patients, since each one has different clinical needs. However, on a general level, it is essential to actively involve the patient in choosing the activities best suited to his abilities and preferences. Offer a variety of stimulating activities, such as caring for plants and flowers, managing small pets, artistic activities such as painting, reading and moments of cultural study, use of musical instruments to encourage personal expression. These activities not only contribute to psychological well-being, but also promote a sense of autonomy and active participation in daily life."

Murat Altın, an SCI patient who has been treated in the hospital for a long time, shared his experiences and ideas during the treatment process:
"*My room was very nice and spacious during my treatment. It would have been better if the light switches were integrated into my bed. If there were railing mechanisms that I could hold onto with my hands right after getting out of bed, it would have been easier for me to mobilize. It would have been more enjoyable if there were smart TVs instead of TV channels. (Youtube, Netflix)*

I would have liked longer windows or a balcony in the room. It is very pleasing for a patient who has to lie down all the time to go outside, it is very difficult for those who have not experienced this to understand. I think that providing patients with the opportunity to go to the pool once or twice a week can be a very important solution to the limited motor skills. Group therapy can also be done with other patients. The toilet and bathroom should be larger. If there was a sound system in the rooms, classical music at certain hours would have been nice.

For the last question of the interview which is asking about the hospital room provides a space where you and your patients can do things you enjoy, he expressed his ideas with these sentences: *Yes, people can adopt pets at this stage. If possible, the daily responsibility of these animals should be given to people. People who are close in age to other patients should definitely be hospitalized and socialized in hospitals. If I had a bird, my boring treatment days would be more cheerful."*

Kadir Çakır also contributed to the interview as another SCI patient, explaining the difficulties in this process and his thoughts on the subject.
"*It was difficult to access the treatment room from the patient room with a wheelchair. The corridors could have been wider and the distance between the areas could have been shorter. Also, there were no healthcare professionals to transfer the patient from room to room. My mother was carrying me in a wheelchair and it made me feel negative psychologically that she was carrying me at this age.*

There could have been medical devices used for the disabled in the hospital rooms. For example, the daily rehabilitation period was 30 minutes and then I would just sit in the room. If there were electrical devices or physical therapy tools in the room instead, I could have trained more myself.

Growing small flowers and talking to them would make me happy. We have to live in a hospital environment for a long time with such health problems. I lived in the hospital for a long time. What did I see when I looked out the window? Just a pile of concrete.. The only activity I could do in the room was to look at the TV screen.. In large rooms, different If I had the chance to do activities, my current psychology would be much more positive.

Okan Ikizturac, as a spinal cord patient, said, "*The bed I was lying in during my recovery period in the hospital after the surgery was positioned right in the middle of the room. Although this situation provided a more comfortable working area for healthcare professionals, it made me feel lonely for the rest of the day. For this reason, it would have made me happier if the bed was positioned close to window so that I could see outside more easily. In this way, I could see what was going on outside and be happier. A similar situation was also valid for the corridors. The corridor was only illuminated by lighting and I could not see daylight or the outside environment. It would have been better if the corridor had some openings.*

I used to dream of an environment where I could see outside very comfortably and where daylight entered more of the room.

After lying in bed for a few days, the doctors told me to move, but there was nothing I could do but walk. There might be devices in the hospital room that would allow me to move, that the doctors would approve of.

Based on the participants' responses, the necessity of a patient-centered approach that integrates physical, psychological and social well-being for both SCI patients and staff in hospitals has been proven. In line with the views obtained from the Interview, critical themes come to the fore in hospitals to be designed for SCI patients.

- Planned narrow corridors and hospital rooms, transportation problems prevent the patient's mobility and create an additional negative psychological effect on the patient. Hospital rooms should be designed in a way that allows wheelchairs, stretchers and other health equipment to be easily positioned. Hospital corridors should allow the patient to move and maneuver easily with a wheelchair, especially in emergency situations.

- The fact that all of the items in hospital rooms; beds, tables, companion beds, etc. are foldable or specially designed with various flexible ways, such as integrating them to the interior walls, to take up less space can stretch the usability of the existing space. The use of technological systems for lighting, ventilation and nurse call systems can strengthen patient psychology by allowing patients to control their own environment. Height-adjustable beds and the design of medical equipment or items that the patient can manage themselves facilitate patient care and encourage independence.

- As discussed under other titles of the thesis, it was emphasized once again by the witnesses in the interview that the psychological environment is equally important for patient well-being. SCI patients demand areas where they can absorb nature and establish contact with the outside through large windows and balconies. The effect of bringing the outside inside can also be offered to users with innovative systems with digital screens or voice commands.

- Increasing the social environment and entertainment opportunities in the hospital environment is essential to accelerate the collective and holistic recovery process of patients. SCI patients and healthcare professionals; gardening, handicrafts or physical exercises suitable for their talents will both increase their motor skills and provide them with leisure activities. In addition, group therapies and cultural activities that can address intellectual topics such as book clubs or movie discussions reduce the emotional burden of a long-term hospital stay and create a supportive sense of community. Interview participants call for special common areas to be included in hospital designs for these activities.

- Privacy and personal autonomy in the hospital environment are among the most important elements for patient comfort. The psychological stress caused by shared areas should be minimized and therefore single-person hospital rooms are more suitable for patients.

- Having physical therapy areas not far from hospital rooms and located on the ground floor can reduce logistical problems related to patient transportation for both the patient and the caregivers. Physical therapy areas should allow the patient to improve themselves not only during the therapy process but also outside the treatment process. In addition, in addition to the family and relatives who will transfer the patient to these spaces; The option of having the hospital performed by volunteers or employees who will make the patient feel comfortable should also be offered to the patient.

As a result, it is vital to include patient and healthcare professional feedback in the architectural design of a hospital designed for SCI patients in order to prioritize physical accessibility, social participation, spatial and psychological comfort elements and to make the hospital a healing space rather than a prison. Human-centered hospitals that balance medical functionality with emotional and social needs can help spinal cord injury patients significantly improve their recovery experience and overall quality of life and accelerate this recovery process.

5.1) THE ORIGINAL SOURCES OF INTERVIEWS

Omurilik Yaralanması Hastalarının İyileşme Sürecini Hızlandırmayı Amaçlayan Hastane Odasının Tasarım Bileşenleri

Öncelikle bu röportaja katılmayı kabul ettiğiniz için çok teşekkür ederim. Bir mimar olarak yapmak istediğim, omurilik yaralanması geçiren hastaların daha konforlu hastane ortamında tedavi görmelerini sağlamak; mimariyle iyileşme sürecini hızlandırmaya yardım edecek hastane odaları tasarlamaktır. Buna katkı sağlamayabilmek adına düşüncelerinizi özgürce ifade etmenizin benim için anlamı çok büyük ve sizi anlıyorum, çünkü sizden biriyim. Yapmaya çalıştığım tüm bu çalışmalar, hepimiz için.
Nilay Yaşar,Politecnico di Torino,''Msc Architecture For Heritage'', Italya

Ad/Soyad:Ethem Levent Polis Meslek: Fizik Tedavi ve Rehabilitasyon Uzmanı (Atlas Tıp Merkezi)

1)Tedavi sürecinde hastane ortamlarında sizin ve hastalarınızın karşılaştığı zorluklar nelerdir? (örnekler: erişilebilirlik, dar alanlar, manevra zorlukları, ışık açma/kapama düğmeleri ve nesnelerin yükseklikleri; çalışma ortamının yeşil alan, doğal ışık ,sirkülasyon eksikliği) Bu zorluklar size hangi duyguları hissettirdi?

Omurilik yaralanması geçiren hastaların takip edildiği merkezler ayrı bir binada ve daha farklı özelliklere sahip olması gerekiyor. Farklı branşlarda takip edilen hastalarla aynı binada olması kalabalık ve gürültülü bir ortama zemin hazırlar. Zaten var olan hastalığın kişide yarattığı psikolojik yıkım huzursuz bir ortam ile iyice artabilir. Odalar mümkün olduğunca tek kişilik olmalı ve refakatçi için uygun bir ortam sağlanmalıdır. Birden fazla hastanın kaldığı odada her hastanın yaşayabileceği psikolojik travma diğer hastayı da etkiler. Odalar tekerlekli sandalye veya sedyenin rahatlıkla manevra yapabileceği büyüklükte olmalı. Özellikle banyo ve tuvalet kapısında eşik bulunmamalı

2) Hastane odalarının günümüz hastane odası gibi olmadığını, bunun yerine bambaşka bir yaklaşımla ve hastaların iyileşim sürecine yardım edebilecek şekilde tasarlandığını hayal edin.. Hayalinizdeki oda nasıl olurdu?

Özellikle tetraplejik hastaların takip edildiği odalarda tavanların cam olması (dış dünya ile bağlantısının kopmaması açısı için kuşları, bulutları, yağmuru, gökyüzünü rahatlıkla görebilmesini sağlamalıyız), ayrıca hastaların kitap okuyabileceği, video ve birçok uygulamayı sesli komutlar ile kullanabileceği tavanda ekran bulunması hastaların morali açısından önemli olacağı kanaatindeyim.
Duvarlarda daha iyi durumdaki hastaların mobilize olurken tutunabileceği tutamaklar olması hasta konforu için çok iyi olur. Ayrıca paraplejik hastaların odalarında yatakların odanın penceresine dönük olması ve hastanın oturduğu yerden dışarıyı görebilmesi için pencerelerin duvarlarda boydan boya olması moral açısından oldukça önemlidir.
Hastaların yataktan transfer aracına geçişini kolaylaştırmak için binalarda yeterli sayıda portabl hasta liftlerinin olması da hastanın konforu için çok önemlidir.
Tetraplejik hastaların görevli sağlık personeline ulaşımını sağlamak için sesli uyaranlara duyarlı bir buton , paraplejik hastaların ise rahatlıkla ulaşabileceği bir buton olması gereklidir.

3)Hastane odasının hastalarınız ve sizin için sevdiğiniz şeyleri yapma imkanı sunan bir alan olduğunu hayal edin (örneğin, küçük çiçekler yetiştirmek). Ne yapmayı isterdiniz ve bu size nasıl hissettirirdi?

Hastaların hobilerine uygun küçük bir alan yaratılarak saksıda canlı çiçekler konulabilir. Akvaryum veya hayatın canlılığını bize aktaran küçük evcil hayvan besleyebileceğimiz kuş kafes gibi objeler konulabilir. Ayrıca 2 berjer koltuk ve arasında zigon bir sehpa ile ziyaretçilerin ve refakatçinin rahat edebileceği sıcak bir ev ortamı yaratılabilir.

Sorular Uzm. Dr. Alp Akça (Psikiyatrist, Çanakkale/Türkiye Devlet Hastanesi, Ruh ve Sinir Hastalıkları Bölümü) ve Elena Vigliocco (Doçent, Torino Politeknik Üniversitesi, Mimarlık ve Tasarım Bölümü) yardımıyla hazırlanmıştır.

Omurilik Yaralanması Hastalarının İyileşme Sürecini Hızlandırmayı Amaçlayan Hastane Odasının Tasarım Bileşenleri

Öncelikle bu röportaja katılmayı kabul ettiğiniz için çok teşekkür ederim. Bir mimar olarak yapmak istediğim, omurilik yaralanması geçiren hastaların daha konforlu hastane ortamında tedavi görmelerini sağlamak; mimariyle iyileşme sürecini hızlandırmaya yardım edecek hastane odaları tasarlamaktır. Buna katkı sağlamayabilmek adına düşüncelerinizi özgürce ifade etmenizin benim için anlamı çok büyük ve sizi anlıyorum, çünkü sizden biriyim. Yapmaya çalıştığım tüm bu çalışmalar, hepimiz için.
Nilay Yaşar, Politecnico di Torino, "Msc Architecture For Heritage", Italya

Ad/Soyad: Feray Polis Meslek: Fizik Tedavi ve Rehabilitasyon uzmanı

1)Tedavi sürecinde hastane ortamlarında sizin ve hastalarınızın karşılaştığı zorluklar nelerdir? (örnekler: erişilebilirlik, dar alanlar, manevra zorlukları, ışık açma/kapama düğmeleri ve nesnelerin yükseklikleri; çalışma ortamının yeşil alan, doğal ışık ,sirkülasyon eksikliği) Bu zorluklar size hangi duyguları hissettirdi?

Dar alanlar ve tedavi aletlerinin elektrik prizlerine olan uzaklığından dolayı taşıma zorluğu, doğal ışık almaması ve havalandırma yetersizliği.

2) Hastane odalarının günümüz hastane odası gibi olmadığını, bunun yerine bambaşka bir yaklaşımla ve hastaların iyileşim sürecine yardım edebilecek şekilde tasarlandığını hayal edin.. Hayalinizdeki oda nasıl olurdu?

Hastane odalarının duvarlarının yapay zeka programlarıyla bir kumanda yardımıyla başka bir ortamda gibi hissettirme fikrini hayal ettim. İster gökdelenin üst katında ister afrikada safaride ister denizaltında balıklarla
bir odada olmak eğlenceli olurdu.

3)Hastane odasının hastalarınız ve sizin için sevdiğiniz şeyleri yapma imkanı sunan bir alan olduğunu hayal edin (örneğin, küçük çiçekler yetiştirmek). Ne yapmayı isterdiniz ve bu size nasıl hissettirirdi?

İlgisi olan hastalar, hasta yakını ve sağlık personelleriyle kitap ve film eleştirisi günleri yapmayı isterdim. Önce odalara konulan bilgisayar ya da televizyonda filmi izleyip daha sonra film üzerine sohbet etmek düşüncesi hastane ortamında motive amacıyla faydalı olabilir.

Sorular Uzm. Dr. Alp Akça (Psikiyatrist, Çanakkale/Türkiye Devlet Hastanesi, Ruh ve Sinir Hastalıkları Bölümü) ve Elena Vigliocco (Doçent, Torino Politeknik Üniversitesi, Mimarlık ve Tasarım Bölümü) yardımıyla hazırlanmıştır.

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Nilay Yaşar, Politecnico di Torino, ''Msc Architecture For Heritage'', Italya

Ad/Soyad: Gülgün Gökoğlu

Meslek: Fizyoterapist

1)Tedavi sürecinde hastane ortamlarında sizin ve hastalarınızın karşılaştığı zorluklar nelerdir? (örnekler: erişilebilirlik, dar alanlar, manevra zorlukları, ışık açma/kapama düğmeleri ve nesnelerin yükseklikleri; çalışma ortamının yeşil alan, doğal ışık ,sirkülasyon eksikliği) Bu zorluklar size hangi duyguları hissettirdi?

① - Oda zeminindeki engeller takılma endişesi yaratıyor.
- Odadaki her eşya, yemek masası, sandalye, dolap ihtiyaç olmasına karşın sedye ya da tekerlekli sandalye hareket alanına yer bırakmıyor.
- Işıklandırma, havalandırma, çağrı butonu ulaşılabilirliği güç
- Tuvalet ve banyo kullanım zorluğu ve darlığı stres oluşturuyor.
- Odada başka hasta olması tercih edilmiyor.
- Pencerenin var olması gün takibi ve doğal ışık açısından ihtiyaç sebebi
- Yataktan transfer aracına geçiş için uygun destekler bulunması

Hareket ve sağlık örüntüsünden, bağımlılık durumuna geçmek ve buna alışmak veya bunun geçiş sürecine devam edebilmek için kendi kendine yetebilirliğin olması, sağlık profesyoneline ulaşmanın kolay olması, düşme veya yaralanma riskinin minimalize edilmesi sürecin zorluğuna katlanılabilir hissetmeye sebep olacaktır.

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Nilay Yaşar, Politecnico di Torino, "Msc Architecture For Heritage", Italya

Ad/Soyad: Gülşen Göksoğlu

Meslek: Fizyoterapist

1)Tedavi sürecinde hastane ortamlarında sizin ve hastalarınızın karşılaştığı zorluklar nelerdir? (örnekler: erişilebilirlik, dar alanlar, manevra zorlukları, ışık açma/kapama düğmeleri ve nesnelerin yükseklikleri; çalışma ortamının yeşil alan, doğal ışık ,sirkülasyon eksikliği) Bu zorluklar size hangi duyguları hissettirdi?

2) Hastane odalarının günümüz hastane odası gibi olmadığını, bunun yerine bambaşka bir yaklaşımla ve hastaların iyileşim sürecine yardım edebilecek şekilde tasarlandığını hayal edin.. Hayalinizdeki oda nasıl olurdu?

- oda zeminlerinin takılmaya sebep olmayacak şekilde olması
- yemek masası, sandalye, çalışma masasının duvarlara entegre edilerek kaldırılıp, alan ardalanacak şekilde planlanması
- Akıllı oda sisteni ile havalandırma, ışıklandırma, hemşire çağrı gibi işlerin kumandayla çözülebilirliği,
- Güneş ışığı alan mümkünse tek kişilik ve bir refakatçi kalabilecek şekilde planlanmış, gerekirse transferin hareketli zeminle sağlandığı (banyo-tuvalet) bir oda, güzel olurdu.

3)Hastane odasının hastalarınız ve sizin için sevdiğiniz şeyleri yapma imkanı sunan bir alan olduğunu hayal edin (örneğin, küçük çiçekler yetiştirmek). Ne yapmayı isterdiniz ve bu size nasıl hissettirirdi?

Doğa manzaralı, pencelerin oturma seviyesinde olduğu geniş, ferah, bilgisayar, kitap okuma, yeni beceriler edinecek programlar egzersiz, sinema hatta sohbet edebilecek bir düzen ve genişlikte olmalı. Günlük yaşamın bir şekilde devam edebileceğini bilmek, sürecin tolere edilebilirliğini kolaylaştırırdı. Yeni beceriler elde edebilmek solunleştirici olabilirdi.

Sorular Uzm. Dr. Alp Akça (Psikiyatrist, Çanakkale/Türkiye Devlet Hastanesi, Ruh ve Sinir Hastalıkları Bölümü) ve Elena Vigliocco (Doçent, Torino Politeknik Üniversitesi, Mimarlık ve Tasarım Bölümü) yardımıyla hazırlanmıştır.

The Design Components Of A Hospital Room Aimed At Accelerating The Healing Process of Spinal Cord Injury Sufferings

First of all, I sincerely thank you for agreeing to participate in this interview. As an architect, my goal is to create a more comfortable hospital environment for patients who have suffered spinal cord injuries by designing hospital rooms that can support the recovery process through architecture. It means a lot to me that you can freely express your ideas to contribute to this goal because I understand you—I am one of you. I am making all these efforts for all of us.
Nilay Yaşar, Politecnico di Torino, "MSc Architecture for Heritage", Italy

Name/Surname: Gianmarco Salvato Profession: Physiotherapist (Il Sorriso)

1)What difficulties do you and your patients encounter in hospital environments during the care process? (Examples: accessibility, limited space, maneuvering difficulties, light switches and object heights; lack of green areas, natural light, circulation in the work environment). What emotions do these difficulties evoke in you?

I think that the most important difficulty my patients encountered during their hospitalization was the lack of opened spaces to enjoy sunny day in summer or in general to take a breath in a different space from the hospital. Talking about other things I would say that is pretty good and functional for patients with disabilities. I've always though that even if there would be difficulties for my patients I would have been there to help them to surpass those obstacles.

2)Imagine that hospital rooms are not like the current ones but are designed with a completely different approach to support the healing process of patients. What kind of environment would you prefer to have for your patients?

I'd prefer an envoironment at patient's measure, I mean that everything would be available for any kind of patients, obviously always thinking about their particular disabilities. I would think about automatic bed that you can control in height, rotation and so on to help them outstanding some mobility problems. I would put in all rooms some grips on the walls to help them standing easily if they can do that and maybe walking using those grip. And in the end I would choose a wider type of access doors to better pass through them by wheelchair.

3)Imagine that the hospital room provides a space where you and your patients can do things you enjoy (for example, growing small flowers). What would you like to do, and how would this experience make you feel?

I would like to experience a normal life, that is something patients usually miss a lot. So a space where they can feel they're just like the other people, going for a walk, so some physical activities like sports or stuff like that (always thinking about their disabilities, so I would personalize them). I think that this kind of experience would makes me feel in a sort of way proud of what they're doing in that moment, because I would think that they've improved so much and I would feel the strong will they have to live a normal life everyday.

The questions were prepared with the help of Uzm. Dr. Alp Akça (Psychiatrist at Çanakkale/Turkiye State Hospital, Department of Mental and Nervous Disorders) and Elena Vigliocco (Associate Professor, Department of Architecture and Design, Politecnico di Torino).

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Nilay Yaşar, Politecnico di Torino, "Msc Architecture For Heritage", Italya

Ad/Soyad: DİLARA GEGE Meslek: FİZYOTERAPİST

1)Tedavi sürecinde hastane ortamlarında sizin ve hastalarınızın karşılaştığı zorluklar nelerdir? (örnekler: erişilebilirlik, dar alanlar, manevra zorlukları, ışık açma/kapama düğmeleri ve nesnelerin yükseklikleri; çalışma ortamının yeşil alan, doğal ışık ,sirkülasyon eksikliği) Bu zorluklar size hangi duyguları hissettirdi?

Kalabalık insan sayısı ve buna bağlı olarak merdivenlerde, asansörlerde ve koridorlarda ilerlemede güçlük ve zaman kaybı yaşamak. Bir diğeri ise hijyen eksikliği.

2) Hastane odalarının günümüz hastane odası gibi olmadığını, bunun yerine bambaşka bir yaklaşımla ve hastaların iyileşim sürecine yardım edebilecek şekilde tasarlandığını hayal edin.. Hayalinizdeki oda nasıl olurdu?

Hayalimdeki oda; fizik tedavi odaları için, kişinin tedavi esnasında çalıştırdığı kaslara ve bu egzersizlerin
vücuduna faydalanma rahatça odaklanabilmesi için tek kişilik, rahat ve ferah olmasını isterdim. Dikkatini dağıtacak herhangi bir nesnenin ve kişilerin olmadığı bir alanın iyileşme açısından daha faydalı olabileceğine inanıyorum.

3)Hastane odasının hastalarınız ve sizin için sevdiğiniz şeyleri yapma imkanı sunan bir alan olduğunu hayal edin (örneğin, küçük çiçekler yetiştirmek). Ne yapmayı isterdiniz ve bu size nasıl hissettirirdi?

Çalabilenlerin müzik aleti çalmasına imkan verilmesini ya da ilgi duyanlar için küçük dinletiler olmasını isterdim.
Müziğin iyileştirici gücüne inanıyorum ve hastaların moralinin artacağını dolayısıyla iyileşmelerine katkıda bulunacağını düşünüyorum. Piyano çaldığım için bir hastane odasına girdiğimde içeride piyano görmek beni çok mutlu ve heyecanlı hissettirirdi.

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Nilay Yaşar, Politecnico di Torino, "MSc Architecture for Heritage", Italy

Name/Surname: Lorenzo Filippo Profession:psychiatry resident

1)What difficulties do you and your patients encounter in hospital environments during the care process? (Examples: accessibility, limited space, maneuvering difficulties, light switches and object heights; lack of green areas, natural light, circulation in the work environment). What emotions do these difficulties evoke in you?

I should begin by saying that I work in both hospital and outpatient settings. In both cases, the presence of old rooms, often poorly lit, evokes negative feelings for both the clinician and the doctor, creating an atmosphere that is not ideal for work

2)Imagine that hospital rooms are not like the current ones but are designed with a completely different approach to support the healing process of patients. What kind of environment would you prefer to have for your patients?

I would like the rooms to be spacious, welcoming, and bright. The patient must first and foremost feel at ease, even before the actual consultation begins

3)Imagine that the hospital room provides a space where you and your patients can do things you enjoy (for example, growing small flowers). What would you like to do, and how would this experience make you feel?

The idea of incorporating relaxing or soothing activities would make the setting less rigid and more functional, both for the patient and the doctor

The questions were prepared with the help of Uzm. Dr. Alp Akça (Psychiatrist at Çanakkale/Turkiye State Hospital, Department of Mental and Nervous Disorders) and Elena Vigliocco (Associate Professor, Department of Architecture and Design, Politecnico di Torino).

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Nilay Yaşar, Politecnico di Torino, "Msc Architecture For Heritage", Italya

Ad/Soyad: ALP AKÇA Meslek: Psikiyatrist / Çanakkale Devlet Hastanesi

1)Tedavi sürecinde hastane ortamlarında sizin ve hastalarınızın karşılaştığı zorluklar nelerdir? (örnekler: erişilebilirlik, dar alanlar, manevra zorlukları, ışık açma/kapama düğmeleri ve nesnelerin yükseklikleri; çalışma ortamının yeşil alan, doğal ışık ,sirkülasyon eksikliği) Bu zorluklar size hangi duyguları hissettirdi?

Her şeyden önce çoğu hastanenin fizik tedavi için uygun ortamı yok. Hastaların hastaneye gelmesi, geldikten sonra da bu alana ulaşması sorun. Fizik tedavi alanları bence tek kat ve haliyle zemin katta olmalı. Asansörlerin sayısı az ve kapasitesi yetersiz. Hastaların hizmete değil, hizmetin hastalara gelmesi lazım. Fiziki tedavi süreleri kısıtlı, hastalarla ilgilenenler ve doktor sayısı yetersiz. Gelen hastanın zaten moreli düşükken bir de bunlara maruz kalması üzücü. Hastaya ev konforu yaşatılmalı, hasta; ihtiyaçları için farklı yerlere sürüklenmemeli.

2) Hastane odalarının günümüz hastane odası gibi olmadığını, bunun yerine bambaşka bir yaklaşımla ve hastaların iyileşim sürecine yardım edebilecek şekilde tasarlandığını hayal edin.. Hayalinizdeki oda nasıl olurdu?

Benim hayalimde tek katlı sıra sıra müstakil evlerin olduğu; ortada kocaman bir bahçenin olduğu bir alan var. Bu evler bu kocaman ortadaki bahçeye açılıyor ve bu bahçede herhangi bir ızgara, spor alanları, belki sıcak-soğuk su havuzları mevcut. Hastalar bu alanda ufak fiziki tedavi hareketleri, spor hareketleri yapıp sosyalleşebilirler. Bu ortadaki kocaman alanda cay kahve içip yemek yiyebilirler. Bu alan, tek katlı evlerin kapısının açıldığı güzel bir alan. Evin içinde ise ergodinamik yataklar, uygun dizayn edilmiş lavabolar tasarlanmalı. (Tekerlekli sandalye tipi konuşlar gibi...)

3)Hastane odasının hastalarınız ve sizin için sevdiğiniz şeyleri yapma imkanı sunan bir alan olduğunu hayal edin (örneğin, küçük çiçekler yetiştirmek). Ne yapmayı isterdiniz ve bu size nasıl hissettirirdi?

Meyve-sebze yetiştirmek ruh sağlığını olumlu etkileyen bir eylem. Ama bunu yaparken hareket kısıtlılığı olmamalı. Az eşya ile çok iş yapılabilmeli hastane odalarında. Yataktan koltuğa dönüşen ya da koltuktan masaya dönüşen tasarlanmış mobilyalar da bu etkinlikler için hastane odalarında daha çok yer açma imkanı sağlayabilir. Sonra bu bitki yetiştirmek için de odanın güneş alması lazım; tıpkı hastalar gibi. İnsanlar da çiçek gibidir; ışık alınca canlanırlar.

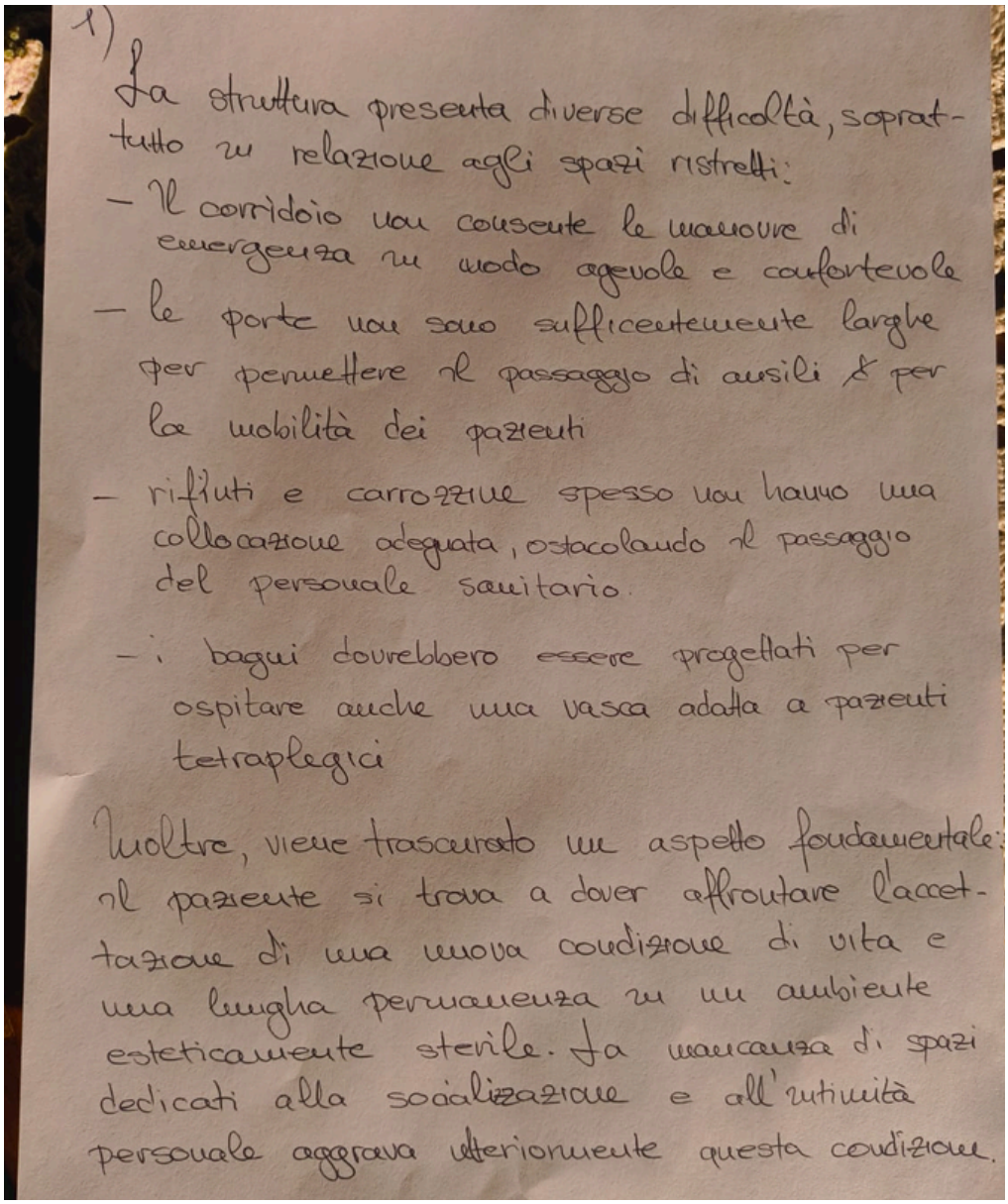
Sorular Uzm. Dr. Alp Akça (Psikiyatrist, Çanakkale/Türkiye Devlet Hastanesi, Ruh ve Sinir Hastalıkları Bölümü) ve Elena Vigliocco (Doçent, Torino Politeknik Üniversitesi, Mimarlık ve Tasarım Bölümü) yardımıyla hazırlanmıştır.

Componenti di Design della Stanza d'Ospedale per Accelerare il Processo di Recupero dei Pazienti con Lesioni al Midollo Spinale

Prima di tutto, ti ringrazio moltissimo per aver accettato di partecipare a questa intervista. Come architetta, il mio obiettivo è creare un ambiente ospedaliero più confortevole per i pazienti che hanno subito lesioni al midollo spinale, progettando stanze ospedaliere che possano favorire il processo di recupero attraverso l'architettura. Per me ha un valore enorme che tu possa esprimere liberamente le tue idee per contribuire a questo obiettivo, perché ti capisco, essendo anch'io una di voi. Tutti questi sforzi li sto compiendo per noi tutti.
Nilay Yaşar, Politecnico di Torino, "Msc Architecture for Heritage", Italia

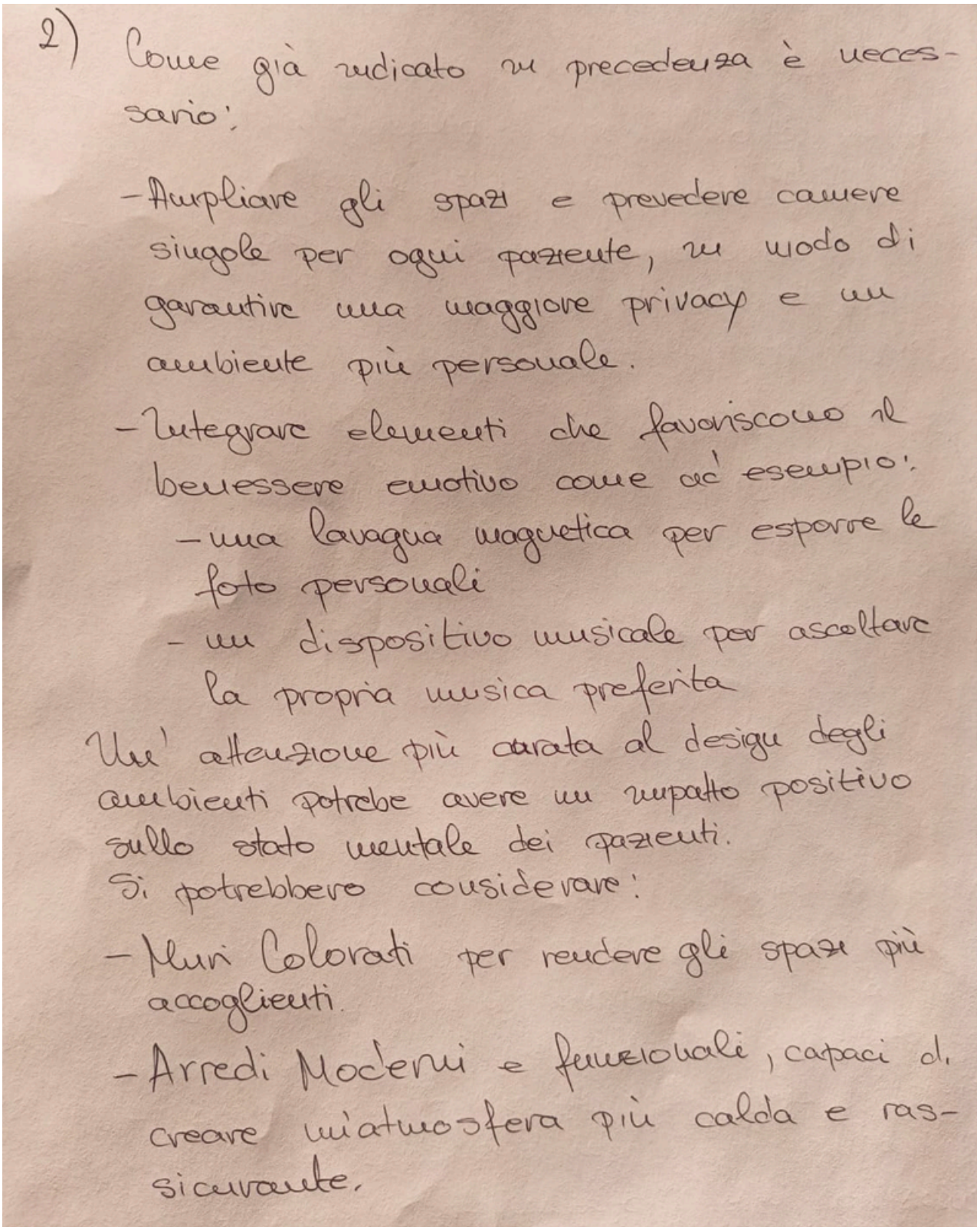
Nome/Cognome:Tatjana Slijepae Professione: Operatore Socio Sanitario
(Presso Istituto Di Montecatone Ospedale di Riabilitazione

1)Quali sono le difficoltà che voi e i vostri pazienti incontrate negli ambienti ospedalieri durante il processo di cura? (esempi: accessibilità, spazi stretti, difficoltà di manovra, altezza dei pulsanti e degli oggetti; mancanza di aree verdi, luce naturale, circolazione nell'ambiente di lavoro) Quali emozioni vi suscinato queste difficoltà?


1)
La struttura presenta diverse difficoltà, soprattutto in relazione agli spazi ristretti:
- Il corridoio non consente le manovre di emergenza in modo agevole e confortevole
- le porte non sono sufficientemente larghe per permettere il passaggio di ausili & per la mobilità dei pazienti
- rifiuti e carrozzine spesso non hanno una collocazione adeguata, ostacolando il passaggio del personale sanitario.
- i bagni dovrebbero essere progettati per ospitare anche una vasca adatta a pazienti tetraplegici

Inoltre, viene trascurato un aspetto fondamentale: il paziente si trova a dover affrontare l'accettazione di una nuova condizione di vita e una lunga permanenza in un ambiente esteticamente sterile. La mancanza di spazi dedicati alla socializzazione e all'intimità personale aggrava ulteriormente questa condizione.

2)Immagina che le stanze ospedaliere non siano come quelle odierne, ma siano progettate con un approccio completamente diverso. Come sarebbe la stanza dei tuoi sogni?



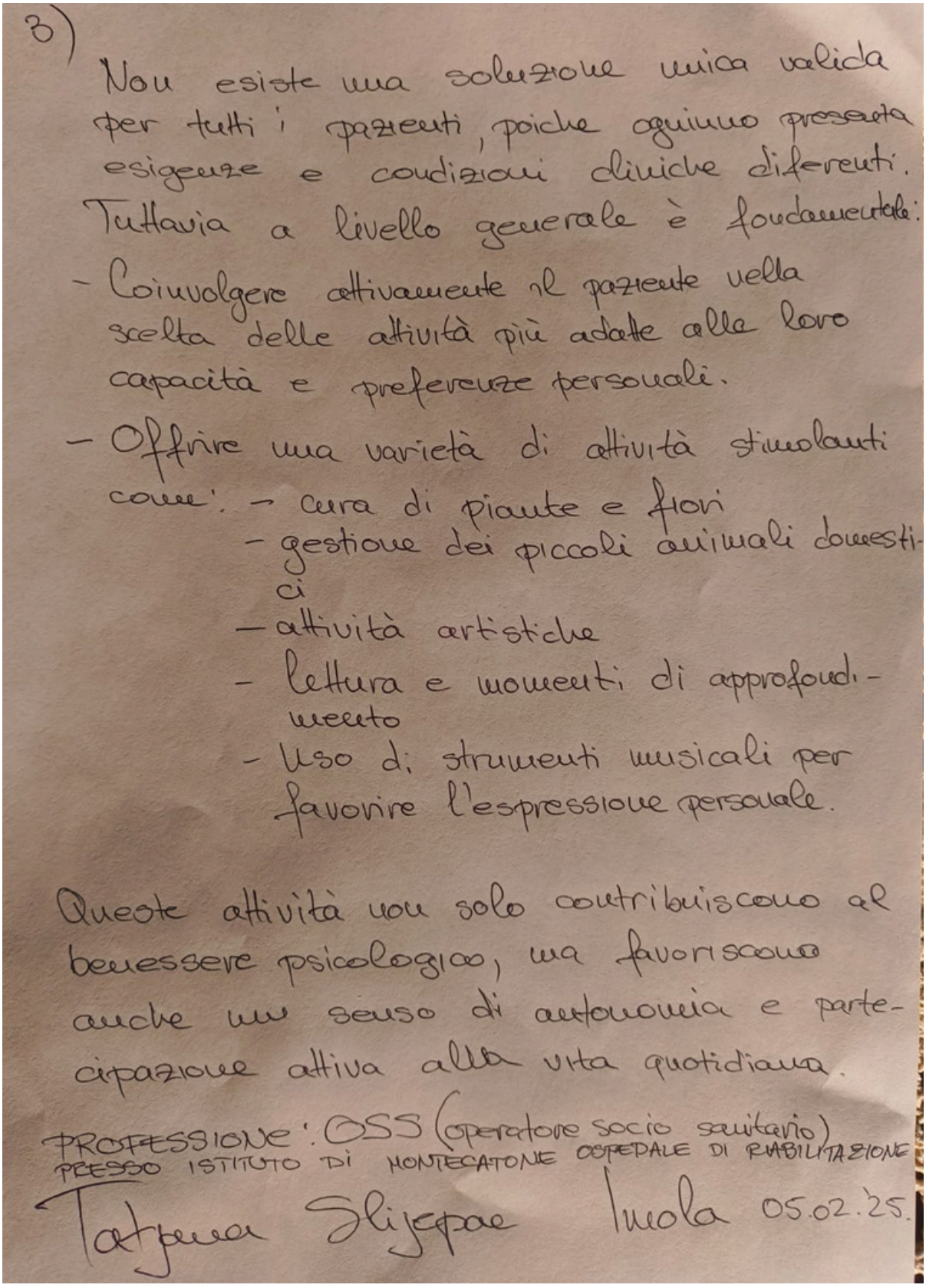
2) Come già indicato in precedenza è necessario:

- Ampliare gli spazi e prevedere camere singole per ogni paziente, in modo di garantire una maggiore privacy e un ambiente più personale.
- Integrare elementi che favoriscono il benessere emotivo come ad esempio:
  - una lavagna magnetica per esporre le foto personali
  - un dispositivo musicale per ascoltare la propria musica preferita

Un' attenzione più curata al design degli ambienti potrebbe avere un impatto positivo sullo stato mentale dei pazienti.
Si potrebbero considerare:

- Muri Colorati per rendere gli spazi più accoglienti.
- Arredi Moderni e funzionali, capaci di creare un'atmosfera più calda e rassicurante.

3)1)Immagina che la stanza dell'ospedale sia uno spazio che ti dia la possibilità di fare cose che ti piacciono (ad esempio coltivare piccoli fiori).Che cosa ti piacerebbe poter fare e come questoti farebbe sentire?



3)

Non esiste una soluzione unica valida per tutti i pazienti, poiche ognuno presenta esigenze e condizioni cliniche differenti. Tuttavia a livello generale è fondamentale:

- Coinvolgere attivamente il paziente nella scelta delle attività più adatte alle loro capacità e preferenze personali.
- Offrire una varietà di attività stimolanti come: - cura di piante e fiori
  - gestione dei piccoli animali domestici
  - attività artistiche
  - lettura e momenti di approfondimento
  - Uso di strumenti musicali per favorire l'espressione personale.

Queste attività non solo contribuiscono al benessere psicologico, ma favoriscono anche un senso di autonomia e partecipazione attiva alla vita quotidiana.

PROFESSIONE: OSS (operatore socio sanitario)
PRESSO ISTITUTO DI MONTECATONE OSPEDALE DI RIABILITAZIONE

Tatjana Slijepac Imola 05.02.25.

Le domande sono state preparate con l'aiuto di Uzm. Dr. Alp Akça (Psychiatrist at Çanakkale/Turkiye State Hospital, Department of Mental and Nervous Disorders), Elena Vigliocco (Professoressa Associata, Dipartimento di Architettura e Design (DAD) Politecnico di Torino).

Omurilik Yaralanması Hastalarının İyileşme Sürecini Hızlandırmayı Amaçlayan Hastane Odasının Tasarım Bileşenleri

Öncelikle bu röportaja katılmayı kabul ettiğiniz için çok teşekkür ederim. Bir mimar olarak yapmak istediğim, omurilik yaralanması geçiren hastaların daha konforlu hastane ortamında tedavi görmelerini sağlamak; mimariyle iyileşme sürecini hızlandırmaya yardım edecek hastane odaları tasarlamaktır. Buna katkı sağlamayabilmek adına düşüncelerinizi özgürce ifade etmenizin benim için anlamı çok büyük ve sizi anlıyorum, çünkü sizden biriyim. Yapmaya çalıştığım tüm bu çalışmalar, hepimiz için.
Nilay Yaşar, Politecnico di Torino, "Msc Architecture For Heritage", Italya

Ad: Murat Soyad: ALTIN Yaş: 30

1)Tedavi sürecinde hastane ortamlarında karşılaştığınız zorluklar nelerdir? (örnekler: erişilebilirlik, dar alanlar, manevra zorlukları, ışık açma/kapama düğmeleri ve nesnelerin yükseklikleri) Bu zorluklar size hangi duyguları hissettirdi?

Tedavi sürecimde odam gayet güzel ve genişti. Işık açma tuşları yatağıma entegre olabilseydi daha güzel olurdu. Yatağımdan kalktıktan hemen sonra ellerimle tutunabileceğim korkuluk mekanizmalarıda olsaydı mobilize olmam daha kolay olabilirdi. Televizyon kanallarından ziyade akıllı televizyon olsaydı daha keyifli olabilirdi. (Youtube, Netflix)

2) Hastane odalarının günümüz hastane odası gibi olmadığını, bunun yerine bambaşka bir yaklaşımla tasarlandığını hayal edin.. Hayalinizdeki oda nasıl olurdu?

Daha uzun pencereler olmasını veya odamın bir balkonu olmasını çok isterdim. Sürekli yatmak zorunda kalan bir hastanın dışarıya çıkması çok mutluluk verici bunu yaşamayanın bilmesi çok zor. Hastaların haftada 1 veya 2 defa havuz imkanı verilmeside çok önemli hareket kısıtlılığına bir çare olabileceğini düşünüyorum. Diğer hastalarla grup terapisiide yapılabilir. Tuvalet ve banyonun daha geniş olması gerekli. Odalarda ses sistemi olsa belli saatlerde klasik müzik de hoş olabilirdi.

3)Hastane odasının sevdiğiniz şeyleri yapma imkanı sunan bir alan olduğunu hayal edin (örneğin, küçük çiçekler yetiştirmek). Ne yapmayı isterdin ve bu sana nasıl hissettirirdi?

Evet bu aşamada kişilere evcil hayvan sahiplendirilebilir. Bu hayvanların günlük sorumluluğu mümkünse kişilere yaptırılmalı. Kesinlikle diğer hastalarla eğer yaşları yakınsa tanıştırılmalı hastanelerde sosyalleşmesi sağlanmalı. Eğer bir kuşum olsaydı sıkıcı tedavi günlerim daha neşeli olabilirdi.

Sorular Uzm. Dr. Alp Akça (Psikiyatrist, Çanakkale/Türkiye Devlet Hastanesi, Ruh ve Sinir Hastalıkları Bölümü) ve Elena Vigliocco (Doçent, Torino Politeknik Üniversitesi, Mimarlık ve Tasarım Bölümü) yardımıyla hazırlanmıştır.

Omurilik Yaralanması Hastalarının İyileşme Sürecini Hızlandırmayı Amaçlayan Hastane Odasının Tasarım Bileşenleri

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Nilay Yaşar, Politecnico di Torino, "Msc Architecture For Heritage", Italya

Ad: KADİR Soyad: GAKIR Yaş: 53

1)Tedavi sürecinde hastane ortamlarında karşılaştığınız zorluklar nelerdir? (örnekler: erişilebilirlik, dar alanlar, manevra zorlukları, ışık açma/kapama düğmeleri ve nesnelerin yükseklikleri) Bu zorluklar size hangi duyguları hissettirdi?

Tekerlekli sandalye ile hasta odasından tedavi odasına erişim zordu. Koridorlar daha geniş ve iki alan arasındaki mesafe daha kısa olabilirdi. Ayrıca odadan odaya hastayı transfer edecek sağlık çalışanları yoktu. Tekerlekli sandalyeyle beni annem taşıyordu ve beni bu yaşta onun taşıması psikolojik olarak olumsuz hissettirdi.

2) Hastane odalarının günümüz hastane odası gibi olmadığını, bunun yerine bambaşka bir yaklaşımla tasarlandığını hayal edin.. Hayalinizdeki oda nasıl olurdu?

Hastane odalarının içinde engelliler için kullanılan tıbbi aletler mevcut olabilirdi. Örneğin, günlük rehabilitasyon süresi ortalama 30 dk idi ve sonrasında odada öylece oturuyordum. Bunun yerine eğer elektriksel cihazlar ya da fiziki tedavi için kullanılan araç-gereçler odada da olsaydı, kendim daha çok antrenman yapabilirdim.

3)Hastane odasının sevdiğiniz şeyleri yapma imkanı sunan bir alan olduğunu hayal edin (örneğin, küçük çiçekler yetiştirmek). Ne yapmayı isterdin ve bu sana nasıl hissettirirdi?

Küçük çiçekler yetiştirmek, onlarla konuşmak beni mutlu ederdi. Böyle sağlık sorunu durumunda hastanede uzun süre yaşıyoruz, ben uzun süre yaşadım. Çevreden baktığımda ne gördüm? Sadece beton yığını. Odanın içinde yapabildiğim tek aktivite ise TV ekranına bakmak. Geniş odalarda farklı aktiviteler yapma şansım olsaydı o anki psikolojim çok daha pozitif olurdu.

Omurilik Yaralanması Hastalarının İyileşme Sürecini Hızlandırmayı Amaçlayan Hastane Odasının Tasarım Bileşenleri

Öncelikle bu röportaja katılmayı kabul ettiğiniz için çok teşekkür ederim. Bir mimar olarak yapmak istediğim, omurilik yaralanması geçiren hastaların daha konforlu hastane ortamında tedavi görmelerini sağlamak; mimariyle iyileşme sürecini hızlandırmaya yardım edecek hastane odaları tasarlamaktır. Buna katkı sağlamayabilmek adına düşüncelerinizi özgürce ifade etmenizin benim için anlamı çok büyük ve sizi anlıyorum, çünkü sizden biriyim. Yapmaya çalıştığım tüm bu çalışmalar, hepimiz için.
Nilay Yaşar, Politecnico di Torino, "Msc Architecture For Heritage", Italya

Ad: OKAN Soyad: IKIZTURAC Yaş: 27

1)Tedavi sürecinde hastane ortamlarında karşılaştığınız zorluklar nelerdir? (örnekler: erişilebilirlik, dar alanlar, manevra zorlukları, ışık açma/kapama düğmeleri ve nesnelerin yükseklikleri) Bu zorluklar size hangi duyguları hissettirdi?

Ameliyat sonrası hastanede iyileşme sürecinde yattığım yatak odanın tam ortasına konumlanmıştı. Bu durum sağlık çalışanlarına daha konforlu çalışma alanı sağlıyor olmasına karşın girişin geri kalan kısmında bana kendimi yalnız hissetmeme neden olmuştu. Bu nedenle yatağın konumunun dışarıyı daha rahat görebileceğim şekilde ayarlanması beni daha mutlu edebilirdi. Bu sayede dışarıda neler olup bittiğini görüp daha mutlu olabilirdim. Benzer durum koridorda da geçerliydi. Koridor sadece ışıklandırma ile aydınlatılıyordu ve gün ışığı ya da dış ortam görmüyordum. Koridor bazı açıklıklara sahip olsa idi daha iyi olabilirdi.

2) Hastane odalarının günümüz hastane odası gibi olmadığını, bunun yerine bambaşka bir yaklaşımla tasarlandığını hayal edin.. Hayalinizdeki oda nasıl olurdu?

Çok rahat şekilde dışarıyı görebildiğim ve gün ışığının daha fazla odaya girdiği bir ortam hayal ederdim.

3)Hastane odasının sevdiğiniz şeyleri yapma imkanı sunan bir alan olduğunu hayal edin (örneğin, küçük çiçekler yetiştirmek). Ne yapmayı isterdin ve bu sana nasıl hissettirirdi?

Yatakta birkaç gün yattıktan sonra doktorlar hareket etmeni söylemişti. Fakat yürümekten başka yapabileceğim hiçbir şey yoktu. Hastane odasında doktorların da onaylayacağı, hareket etmeni sağlayacak aletler olabilirdi.

Sorular Uzm. Dr. Alp Akça (Psikiyatrist, Çanakkale/Türkiye Devlet Hastanesi, Ruh ve Sinir Hastalıkları Bölümü) ve Elena Vigliocco (Doçent, Torino Politeknik Üniversitesi, Mimarlık ve Tasarım Bölümü) yardımıyla hazırlanmıştır.

5.2) CONCLUSION OF RESEARCHES

Throughout this thesis, the aim was to answer a widely important and for me deeply personal question: Can architecture heal? Through historical research, design analysis, and interviews with patients and professionals, it became clear that architecture can do more than serve a functional purpose, it can actively support the recovery of people especially with Spinal Cord Injury (SCI) and shows **architecture can heal.**

Looking at history, architecture has always adapted to society's understanding of health, safety, and emotional well-being. Over time, hospital design has moved from large, impersonal institutions to specialized, human-centered environments that use light, color, nature, and thoughtful spatial design to support healing.
For SCI patients, who face physical and emotional challenges, design plays a therapeutic role. Features like art, calming colors, natural views, and controlled lighting help reduce stress and promote dignity and hope. Healing gardens, too, are not just decorative but also they encourage movement, social interaction, and mental well-being.
Interviews confirmed that hospitals should offer both privacy and community, balancing comfort with medical needs. These insights guided design proposal for the Ex Ospedale Militare Alessandro Riberi, which combines historical respect in the last chapter.

Throughout the thesis, well-designed hospitals help not just physical treatment, but also emotional healing. So, design components that accelerate healing for Spinal Cord Injury in Hospital Environments must consider,

- Understand that SCI patients see the world from a horizontal position, not vertical.
- Use calming colors, soft lights, and quiet sounds to support mental health.
- Be connected with nature, because nature helps healing.
- Offer private, personalized spaces, because every patient is different; hospital rooms not shared with other patients.
- Be easy to move around, with accessible design for wheelchairs and equipment.
- Easy connection to outside.
- Windows placed for patients lying in bed to see outside.
- Details such as quiet water sinks, and soft lighting on both floors and ceilings in order to guide the patient.
- Healing gardens and outdoor therapy spaces.
- Comfortable social areas where patients, families, and nurses can meet.
- Flexible, modular building systems that can be changed when needed.
- Patients accompanied by volunteers or trained staff who help them feel safe and respected.

In conclusion, this thesis proves that healing is not just medical but it is also architectural. A hospital for SCI patients should be more than a place for treatment. Human-centered design; focused on physical access, emotional well-being, and social connection can turn hospitals into healing homes rather than cold medical spaces.

In the end, this thesis shows that architecture, when designed with empathy and knowledge, becomes an active part of healing. As someone who has lived this experience and studied architecture, I believe architecture can create spaces that accelerate recovery, a place of hope and care, increase quality of life; not just for the body, but also for the heart and mind. Today's architects must design not only spaces, but also healing experiences.
Because sometimes, a window, a tree, or a ray of sunlight can heal more than a medicine.

CHAPTER 6:

Design Proposal

"Spinal Injured Hospital"

A Healing Space for Spinal Cord Injury Patients

(EX OSPEDALE MILITARE
ALESSANDRO RIBERI)

1903

1914

1939

1945

CONSTRUCTION PROCESS AND OPENING [1]

- In 1903, it was decided to build a military hospital in Torino.
- The hospital was named after Alessandro Riberi (1794–1861). Riberi was a professor at the University of Turin, Royal Surgeon and a key figure in the modernization of medical education in Italy. He played a major role in the modernization of medical education in Italy and was the pioneer of medical reforms.
- The hospital was officially opened on July 5, 1914.

Alessandro Riberi

Internal pavilion of the Hospital Main entrance of the Military Hospital of Turin, 1914-1917

II. WORLD WAR [2]

- Served soldiers during World War II.
- Exposed to heavy bombing in 1942

2000

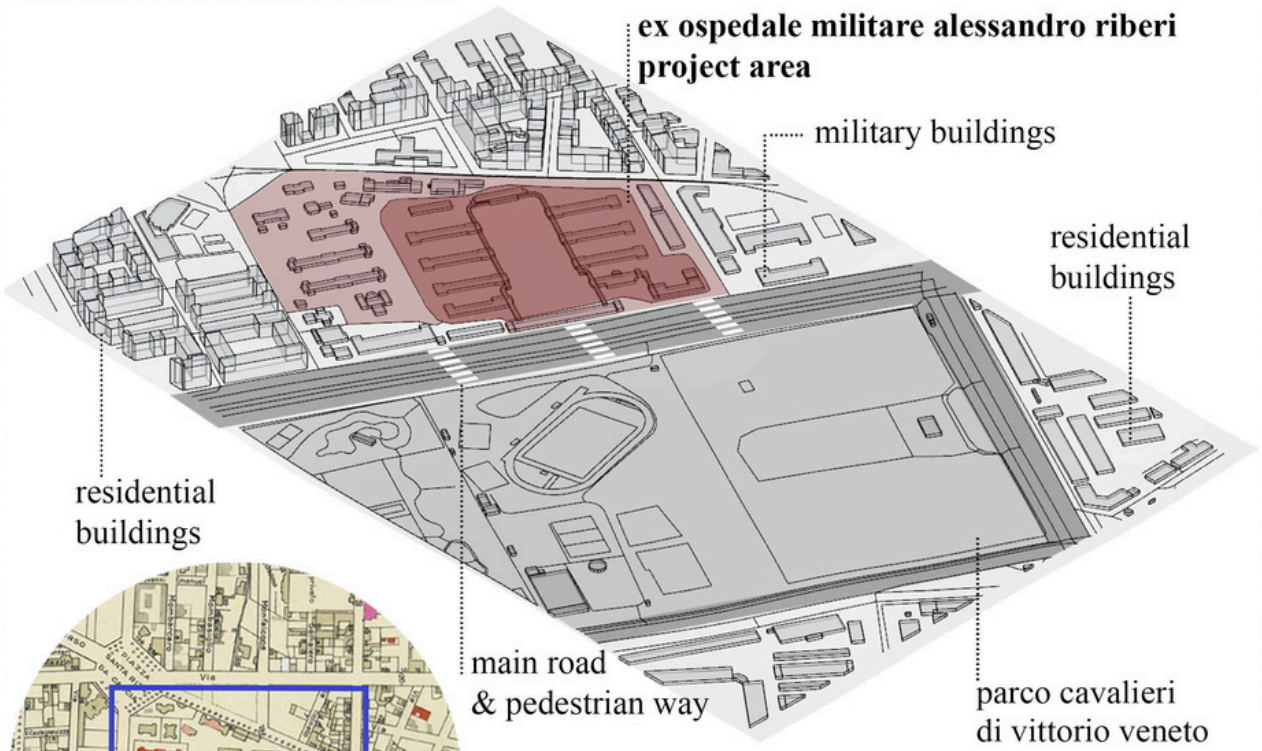
CONTEMPORARY AGE[3]

- After the war, the hospital continued to provide military health services.
- Over time, some of its sections were used for military medical research and forensic services.
- In 2006, the hospital underwent extensive restoration. 19 of the 25 buildings were restored.
- The restored sections house the Military Forensic Medicine Center and some sections are used as housing for military personnel. The abandoned areas are temporarily used for various events, but are generally empty and waiting for a new function..

6.1) SITE ANALYSIS

EX OSPEDALE MILITARE ALESSANDRO RIBERI

SITE ANALYSIS



Ex Ospedale
Militare Riberi Torino, 1942

Coordinates:
45.0474° 7.6514°

Topography:
Reletively flat

Circulation:
Vehicular access
from surrounding streets with
public transportation and
covered walkways

Why here?:

_The **horizontally** spreading pavilion structure is suitable for accessibility and privacy of SCI individuals, meanwhile **vertical** layers also have the potential to be connected with the **garden**.

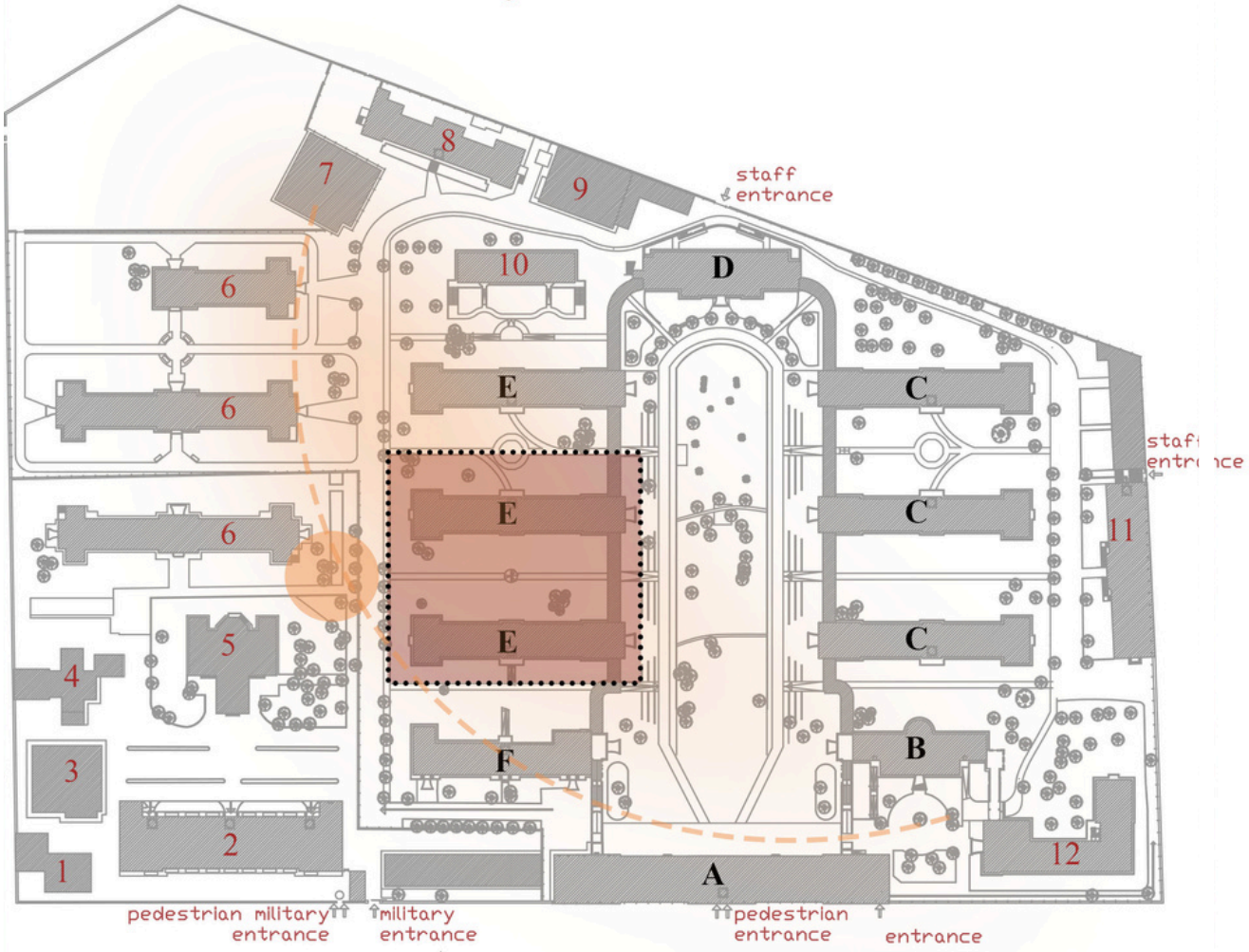
_The natural light provided by its **high ceilings and wide corridors,**

_**Courtyards and green spaces** offer therapeutic potential for **garden therapy, socialization, and outdoor exercise,**

_Used as hospital before and so easy to adaptaptive by respecting to **historical texture and heritage,**

_Ensures **cultural sustainability** and provides **visual view** to patients with Turin's identity.

Why there?:



0 50m 100m

A: administration
B: surgical operations pavilion
C: area where military, nuns and nurses prepare for duty
D: pavilion for kitchen
E: pavilion for common diseases
F: pavilion for epileptics and scientific laboratories

1: official cavalry stables
2: barracks for the medical company
3: mobilization carriage shed
4: disinfector and crematory oven
5: church
6: infectious diseases pavilion
7: pavilion for nuns
8: laundry
9: technical zone
10: dermatology pavilion
11: bath pavilion
12: pavilion officers under medical care

_Soutwest is the direction of where **natural light** provided,**trees** between the buildings ; **shading** provided

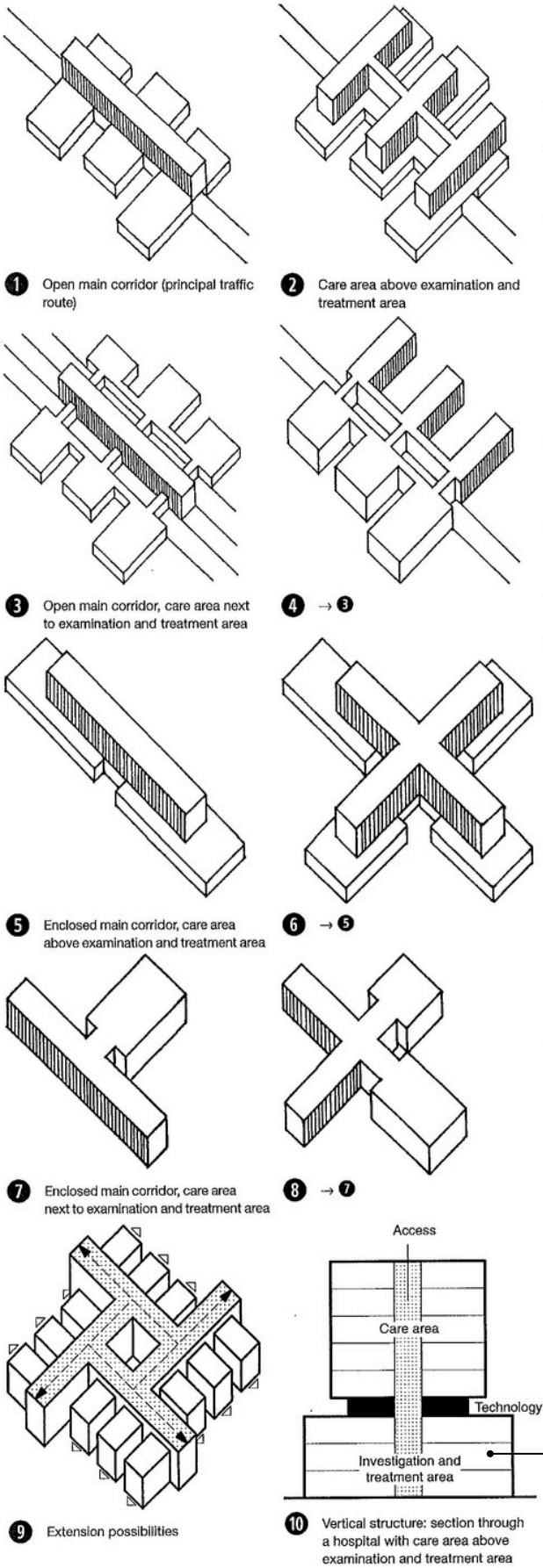
_Being close to **infrastructure area** and **to the existing entrance** in any emergency situations,

_Used as a hospital in the past and so respect the **historical texture** with also **suitable layout already,**

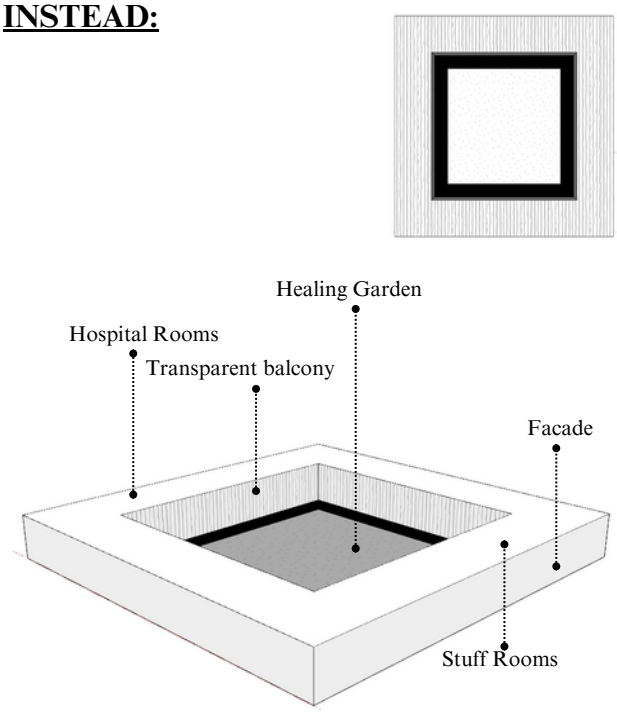
_Suitable location and distribution **from the center** with its green area within the **concept**

6.2) CONCEPT

General Layout of Hospital Design:



INSTEAD:

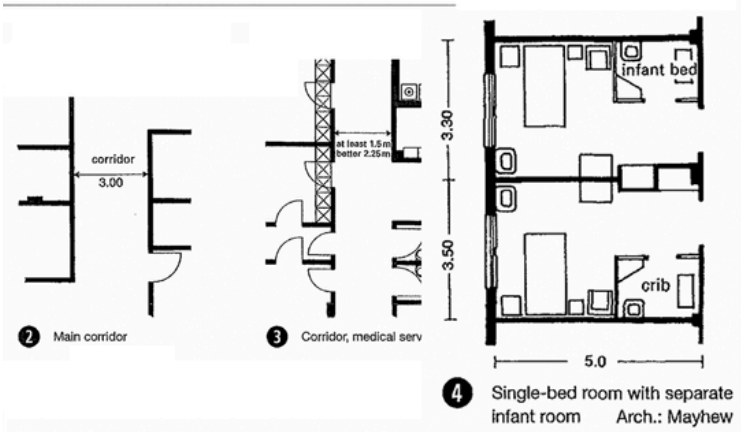


- healing garden in the center
- distribution from the center
- easy accessibility of hospital functions
- sustainable
- acceleration of psychological and physiological healing process for patients
- ease of direction and quick access
- increased morale for staff and efficiency in work
- more area for being social and do activity
- south east and south west natural light for patients

Ernst Neufert, *Architect's Data,* 4th ed. (Chichester, West Sussex: Wiley-Blackwell, 2012), 293.

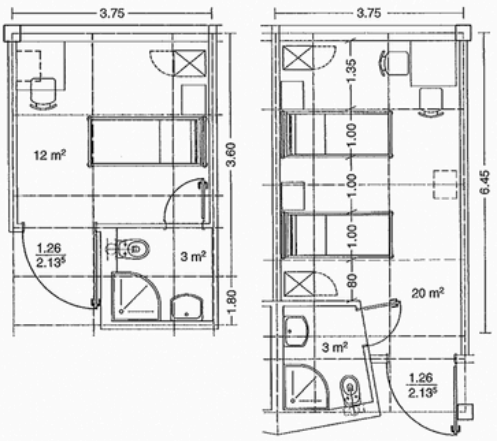
thanks for the **dimentions** but....

What Did You Design, Whom Did You Forget?

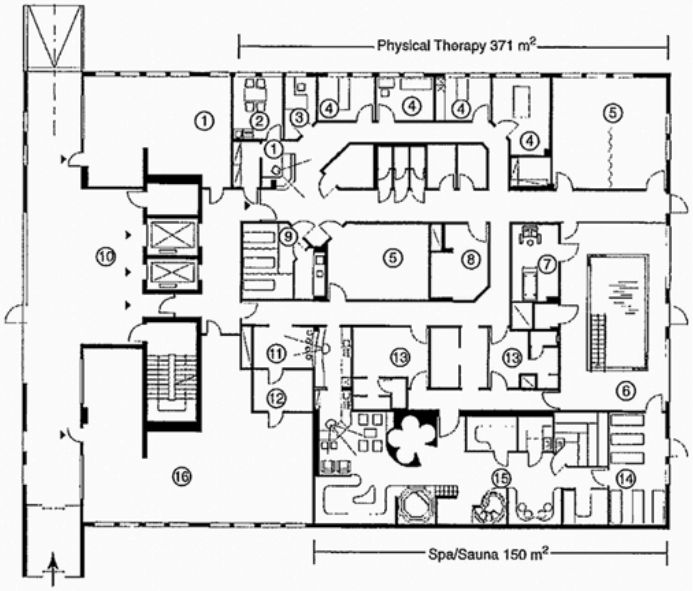


❷ Main corridor ❸ Corridor, medical serv

❹ Single-bed room with separate infant room Arch.: Mayhew



❶ One-bed patient room ❷ Two-bed patient room

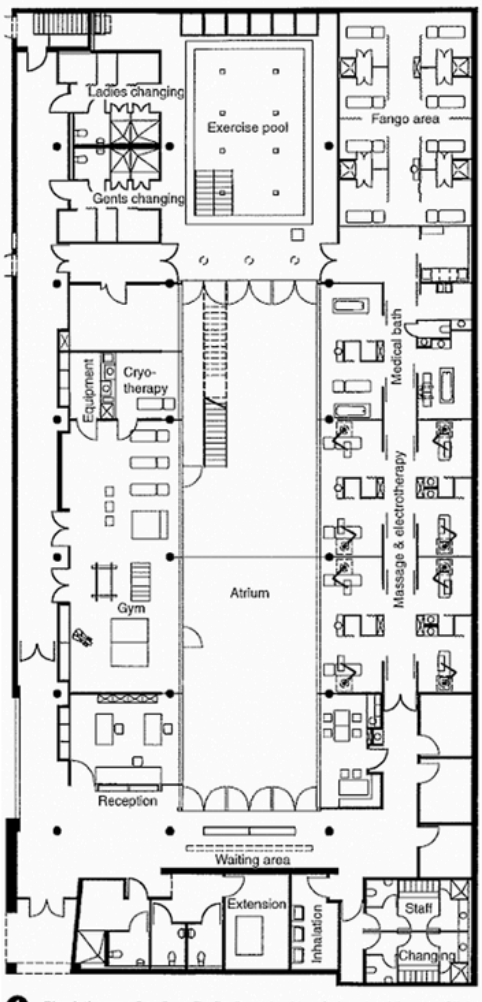


❷ Physiotherapy, ground floor, Thüringen Clinics, Saalfeld-Rudolstadt
Arch.: Thiede Messthaler Klösges Kasper

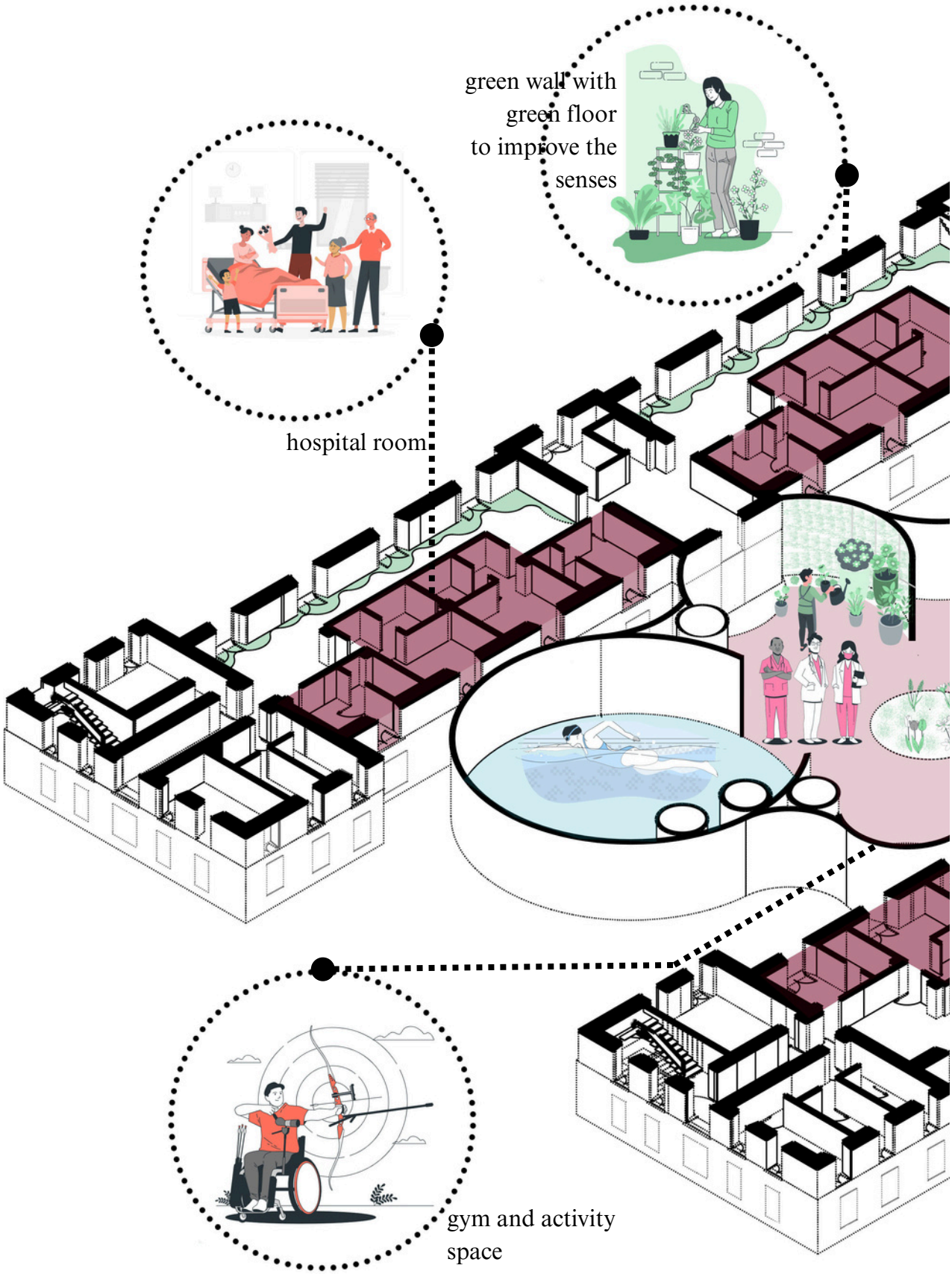
① Special use (66 m²)
② Personal residence
③ Office
④ Treatment
⑤ Gymnastics
⑥ Exercise pool
⑦ 4-cell bath
⑧ Occupational therapy
⑨ Massage
⑩ Elevator hall
⑪ Waiting
⑫ Cosmetics
⑬ Locker room
⑭ Rest room
⑮ Spa / Sauna
⑯ Pharmacy (132 m²)

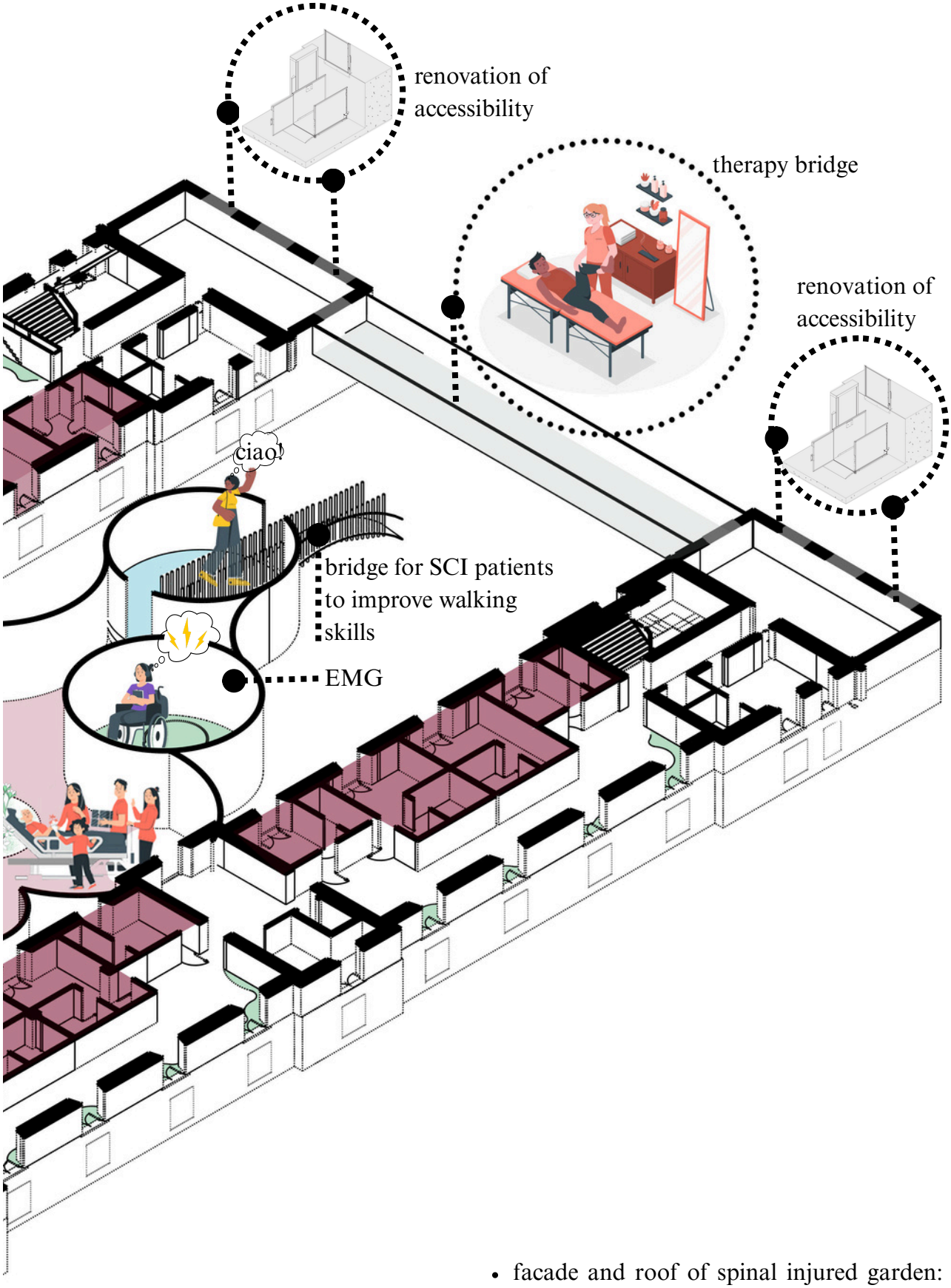
where is **greenary?**

where is **patient rooms?**



❶ Physiotherapy, first floor, Berlin-Spandau Hospital; today: Vivantes Clinic, Berlin-Spandau Arch.: Heinle, Wischer und Partner Freie Architektene

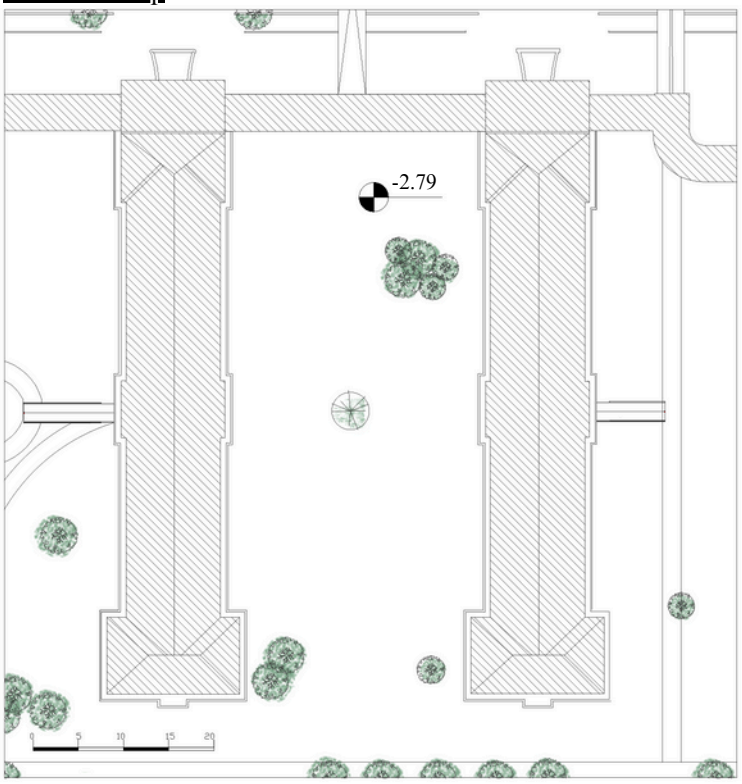

green wall with
green floor
to improve the
senses
hospital room
gym and activity
space



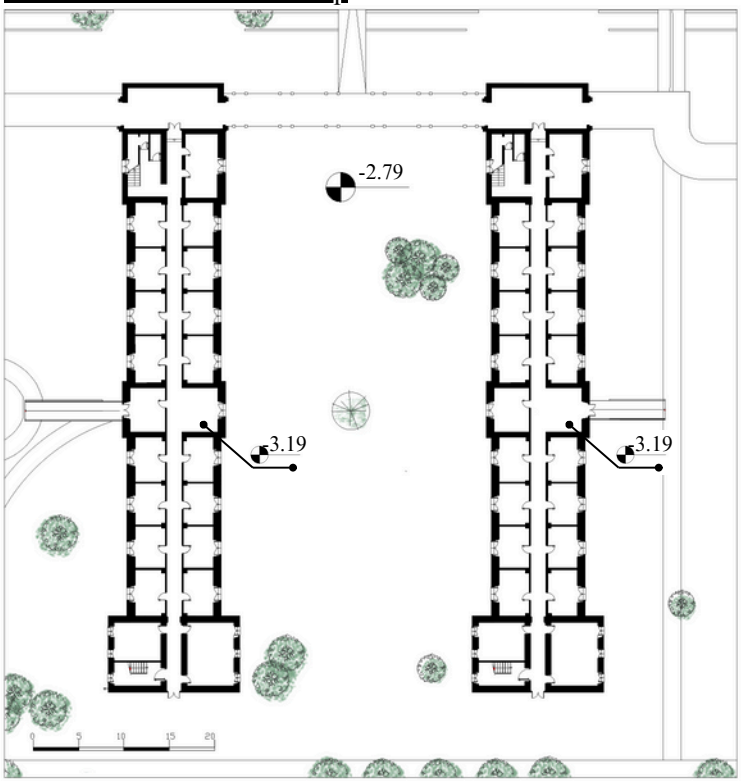
- facade and roof of spinal injured garden: **wood and transparent**
- spinal injured garden floor: **brutal concrete**
- green hall floor: **partially grass**
- hospital room floor: **rubber flooring**

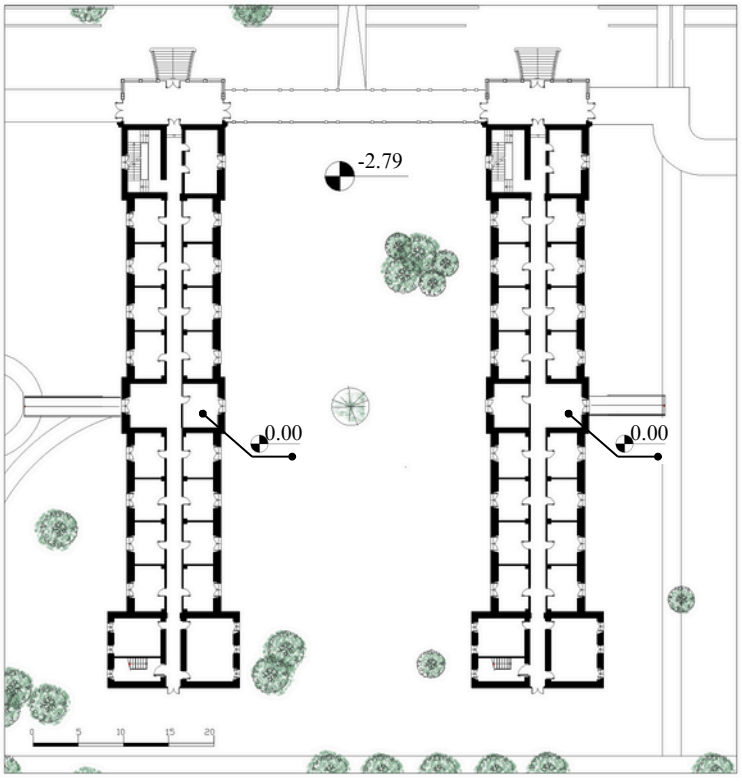
6.3) OLD FLOOR PLAN MAPS

Site Plan Map

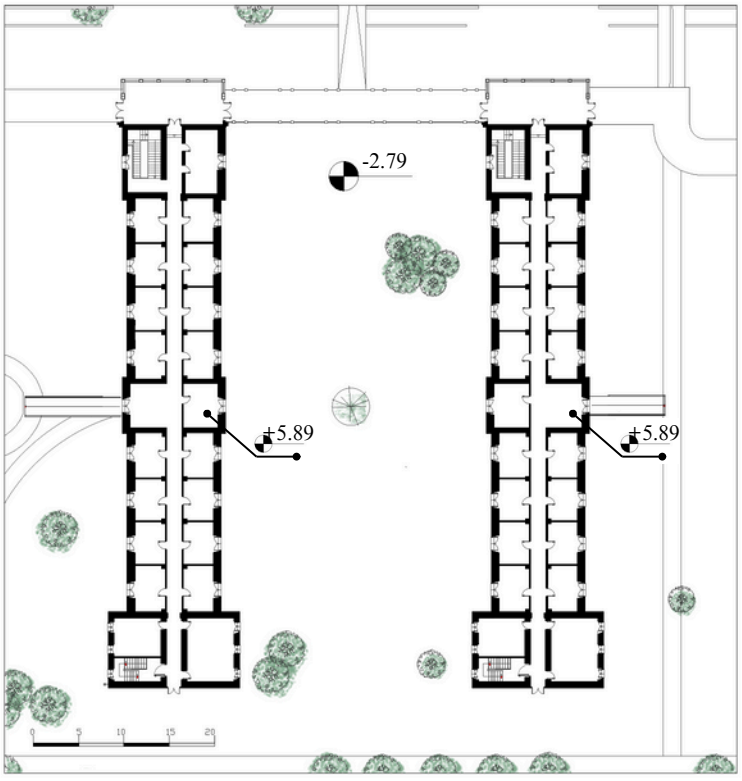


Semi Ground Floor Plan Map





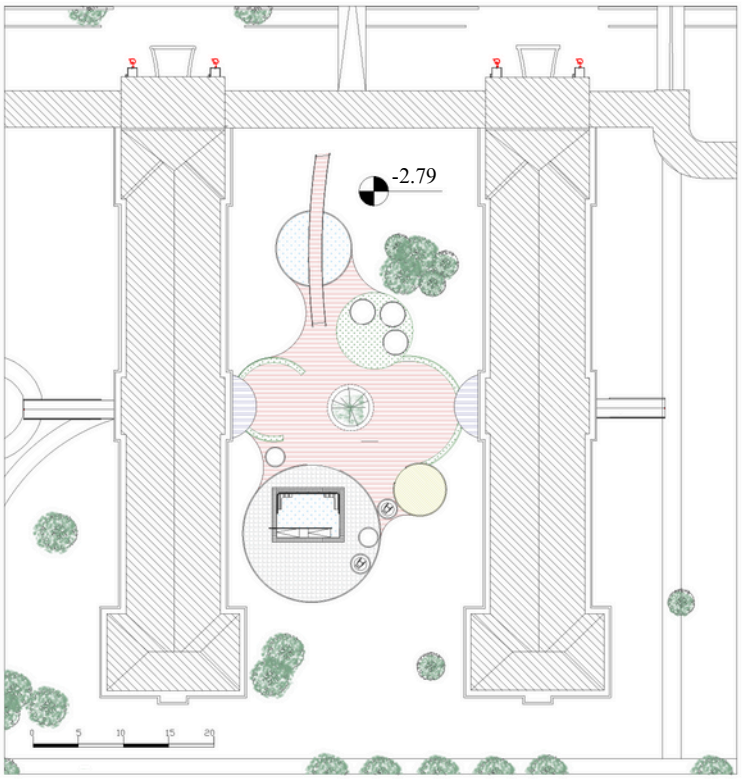
Ground Plan Map



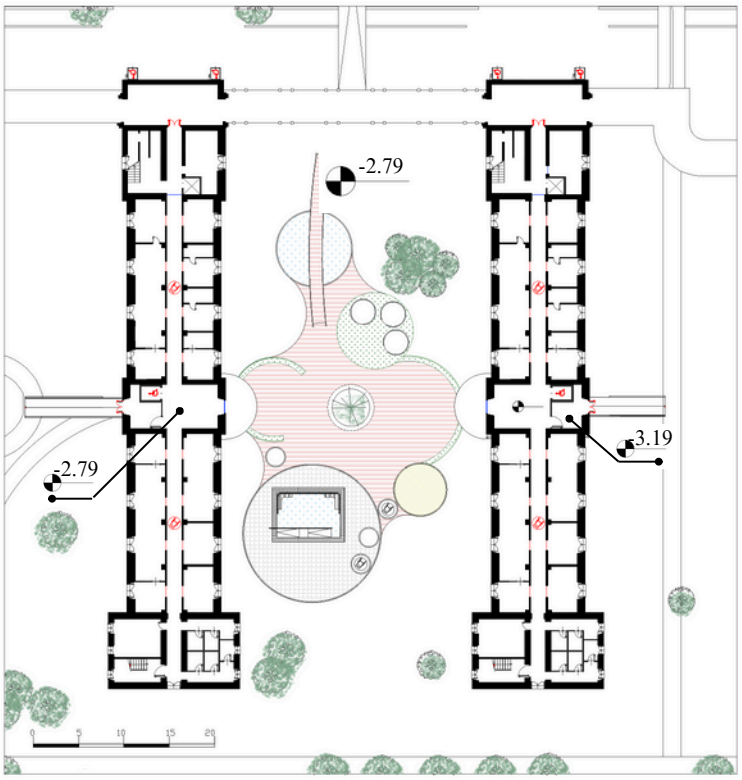
First Floor Plan Map

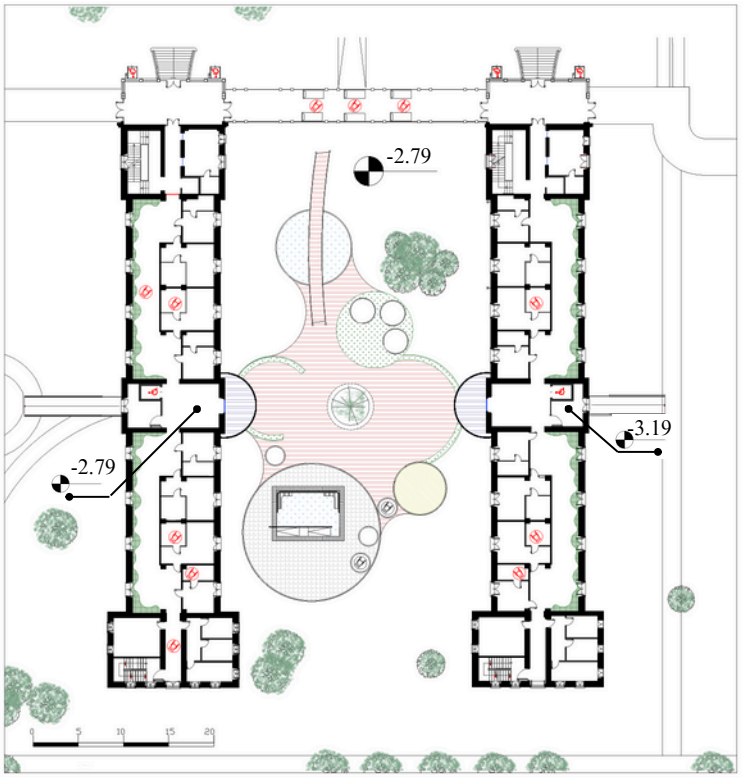
6.4) NEW FLOOR PLAN MAPS

Site Plan Map

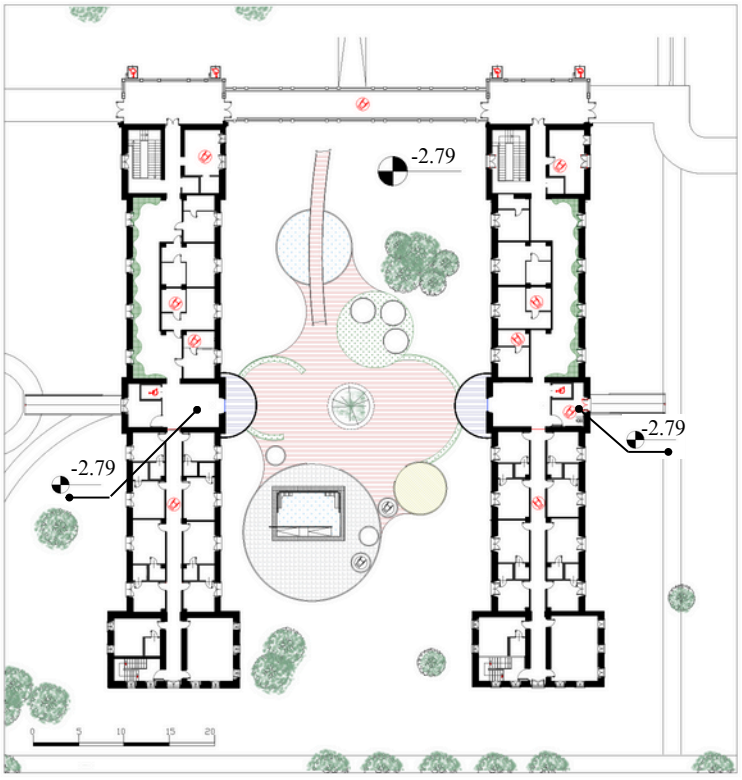


Semi Ground Floor Plan Map





Ground Plan Map

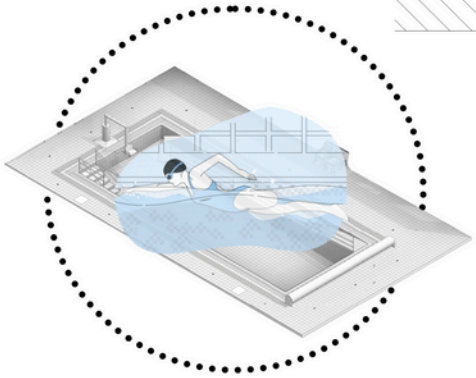


First Floor Plan Map

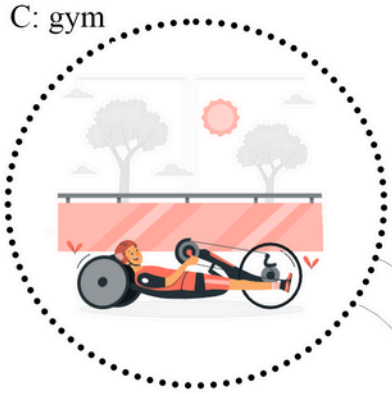
6.5) PROPOSAL PLANS

A: changing room

B: hydrotherapy pool



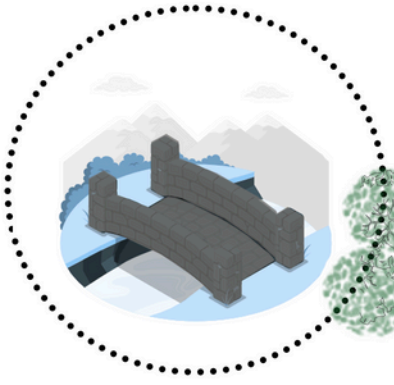
C: gym

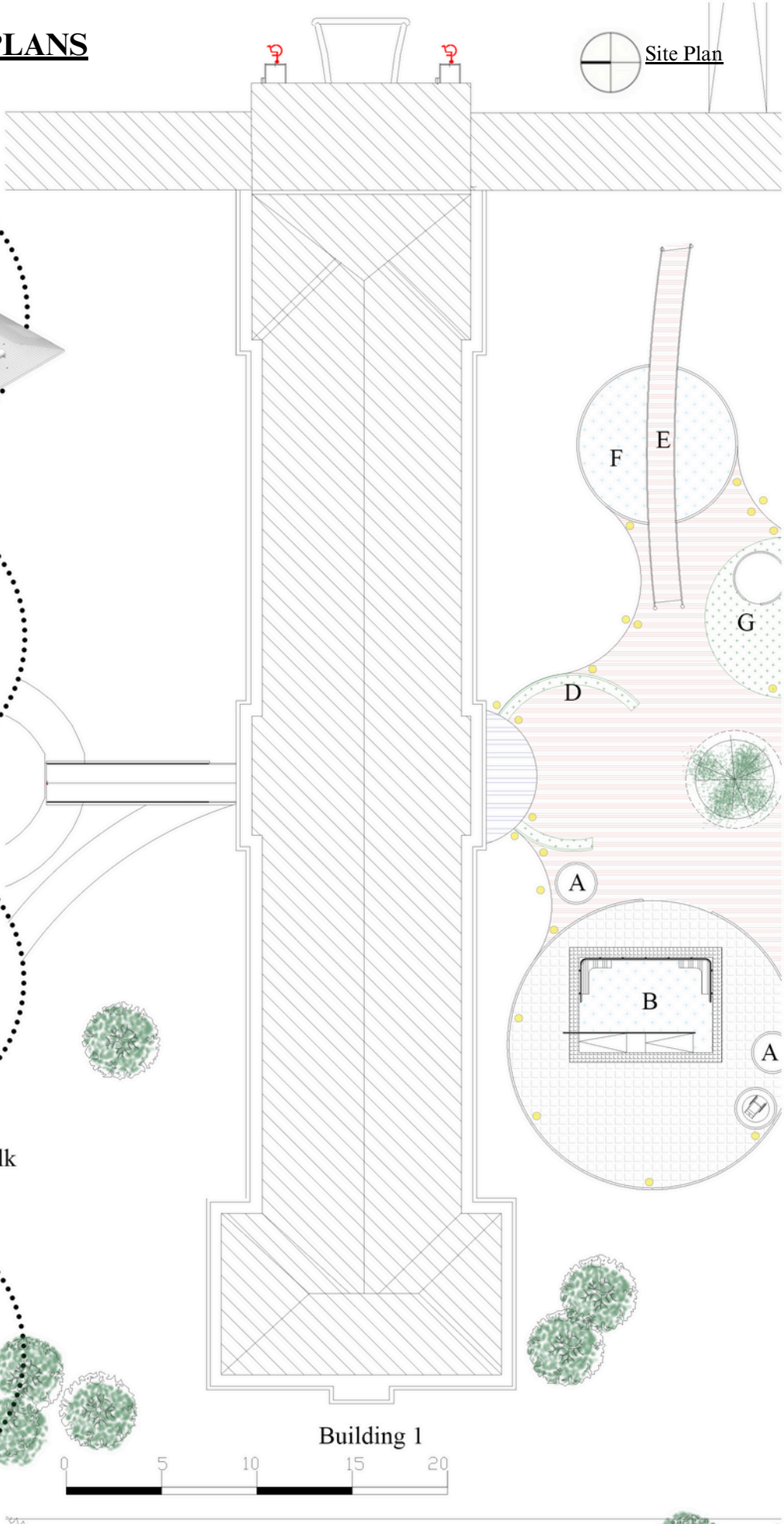


D: gardening

E: bridge for disable to walk

F: 50cm depth waterfont





-2.79

G

D

H

C

Building 2

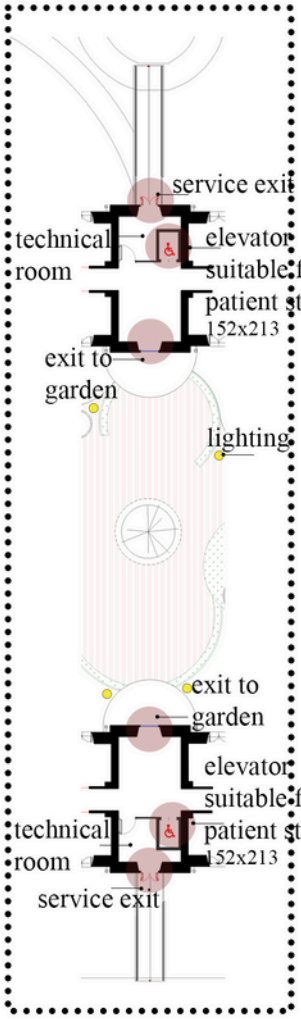
G: electromyography (EMG/NCS) room

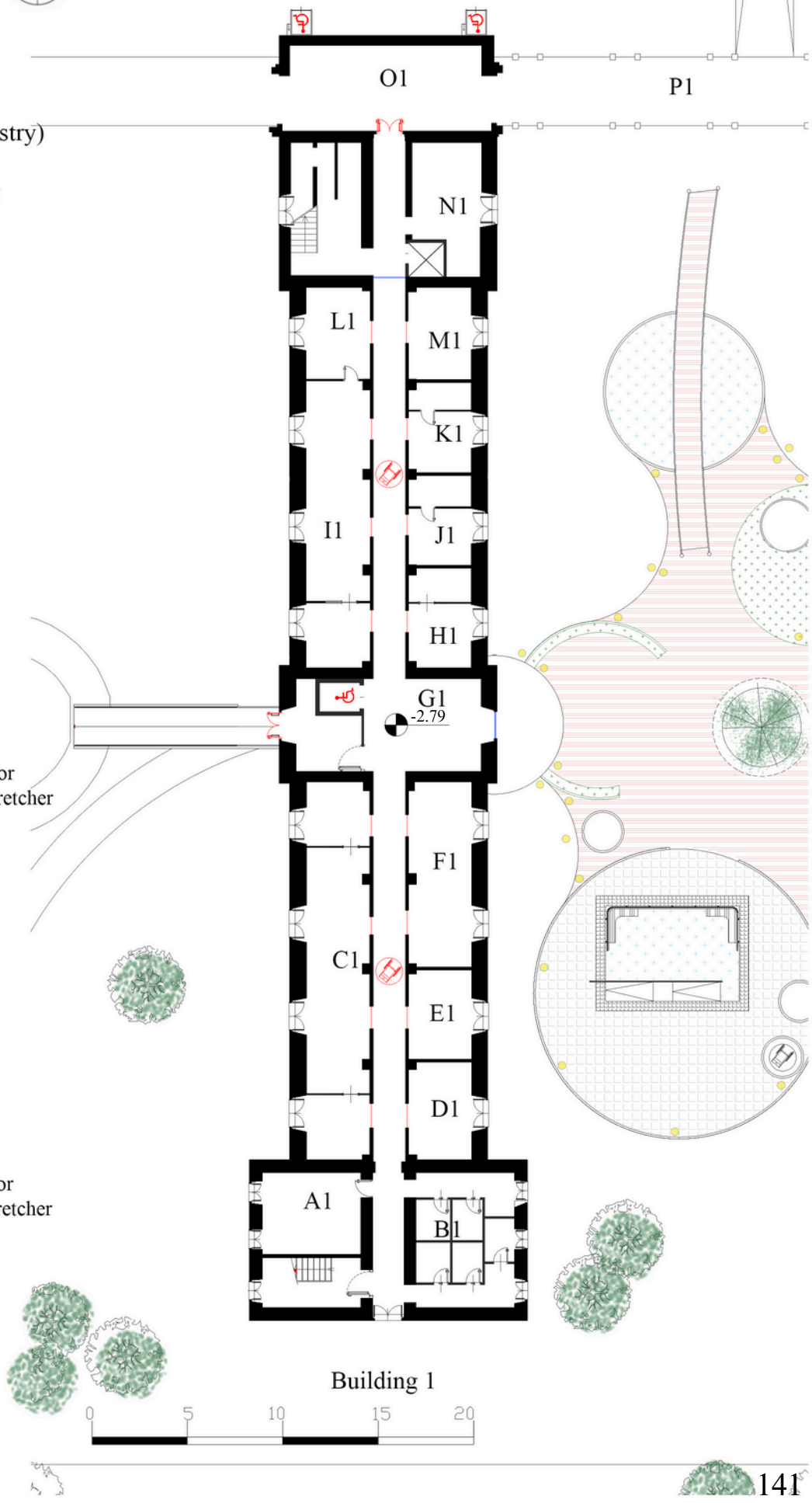
H: multi purpose hall

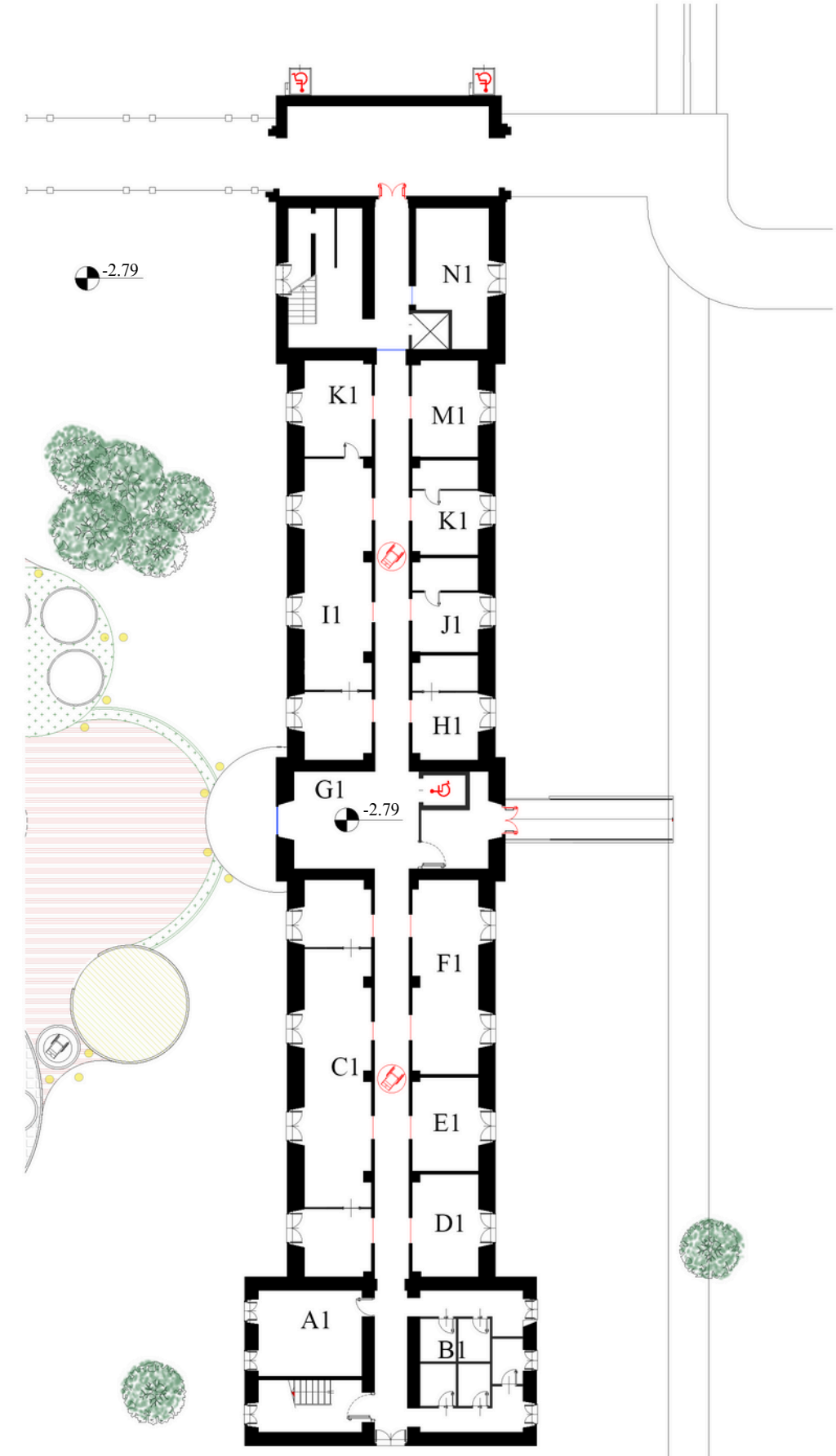
Semi Ground Floor Plan

A1: storage
B1: wc
C1: clinical laboratory
(blood, urine, biochemistry)
65 m2
D1: urodynamic testing
Room 16 m2
E1: stuff room 16 m2
F1: X-RAY 33 m2

G1: exit to garden



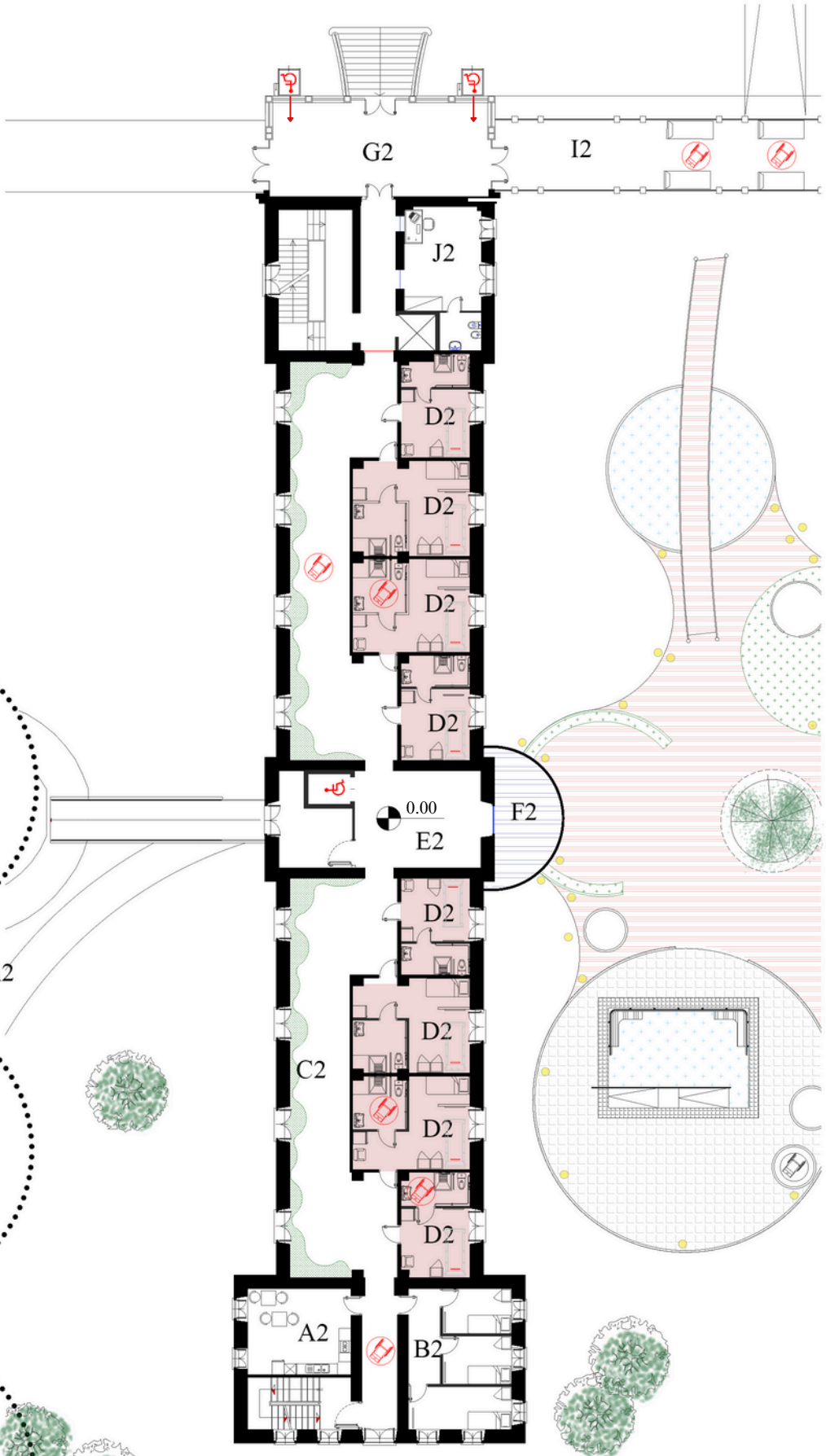




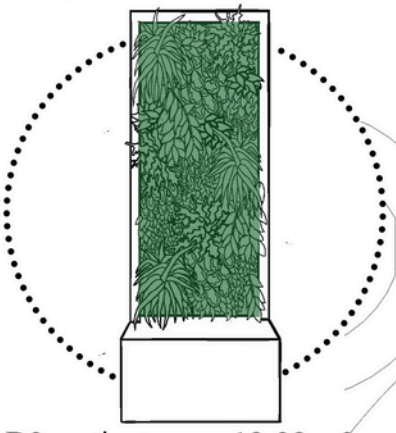
Building 2

H1:DEXA
(for bone density)16 m2
I1: MRI
Magnetic Resonance
Imaging 49 m2
J1: ultrasound16 m2
K1: Electromyography
(EMG/NCS) Room 16 m2
L1: laundry 16 m2
M1: pharmacy 16m2
N1:reception
O1:entrance
P1: activity area

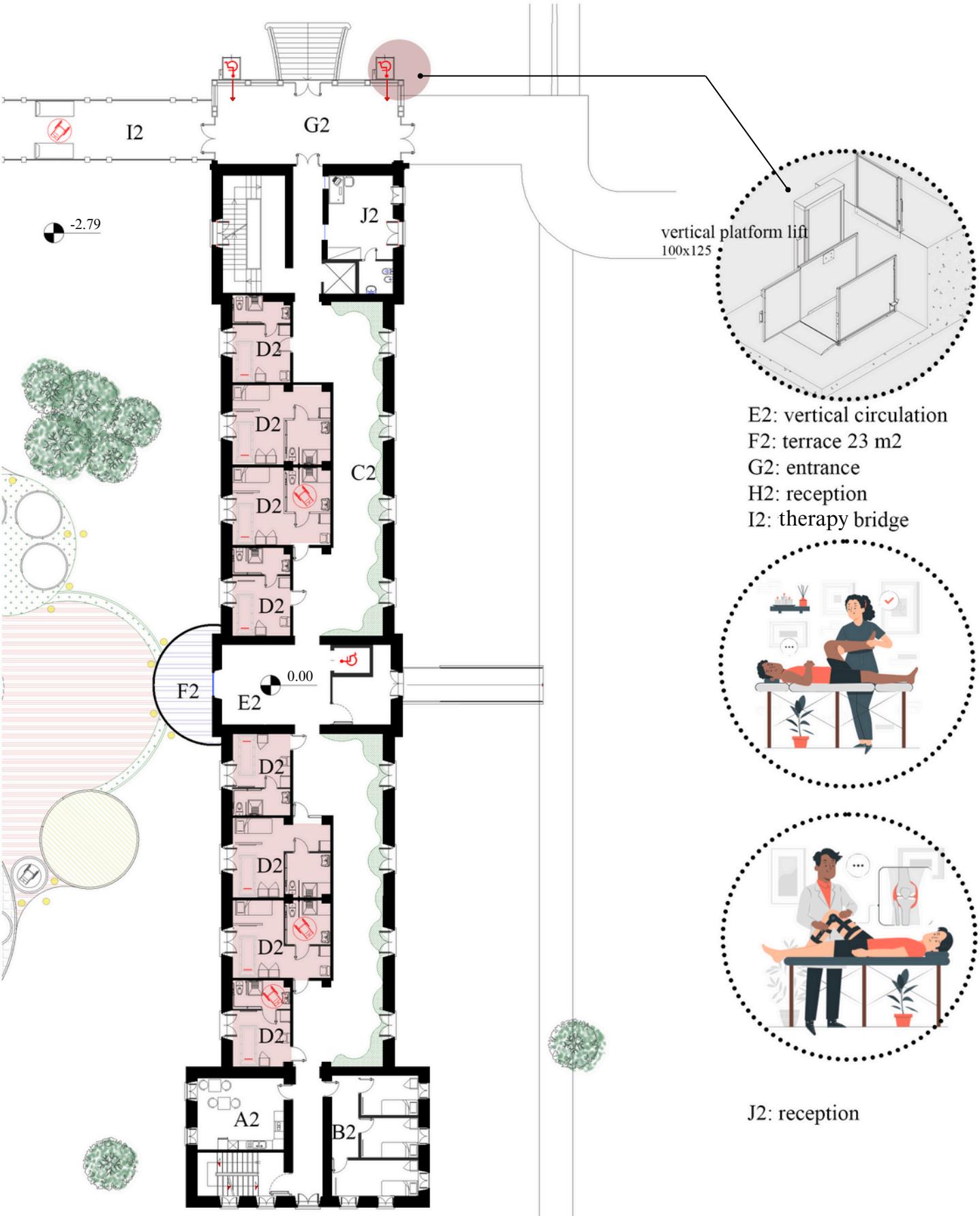
Ground Floor Plan



A2: kitchen
B2: companion room
C2: green wall hall



D2: patient room 18-28 m2



Building 2

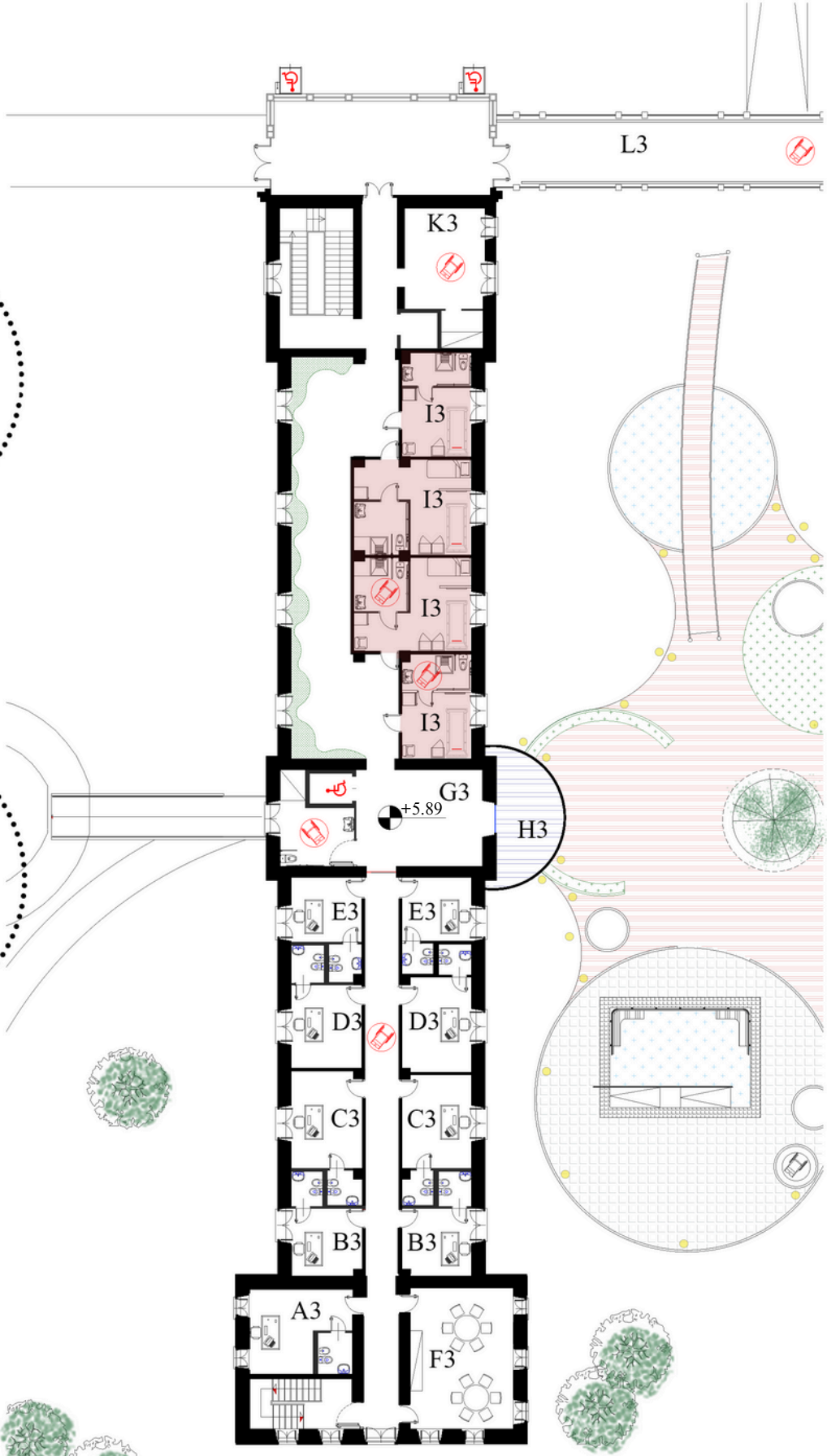
E2: vertical circulation
F2: terrace 23 m2
G2: entrance
H2: reception
I2: therapy bridge

J2: reception

First Floor Plan

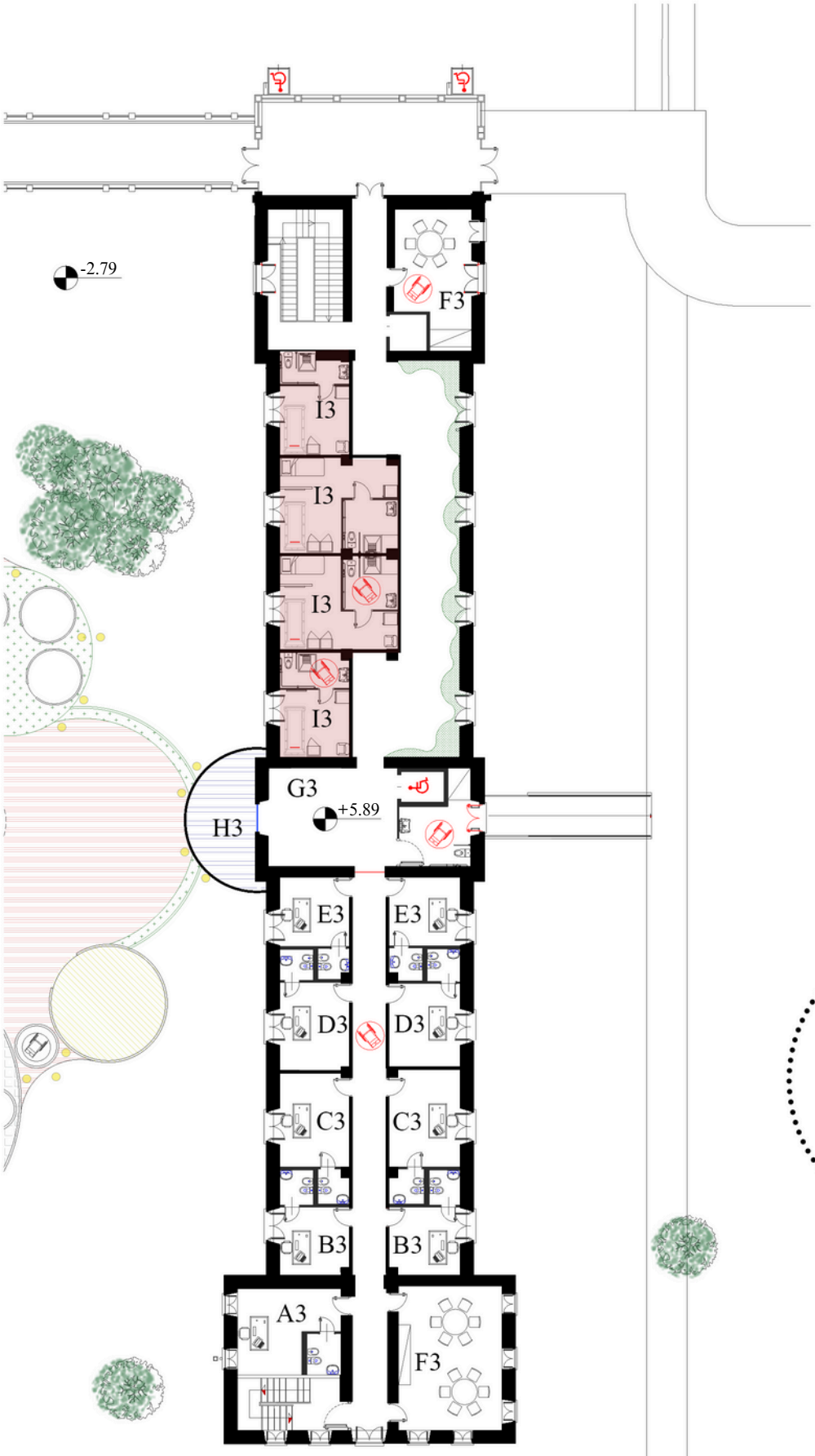
A3: administration
B3 : physiotherapist room 16m2
C3: doctor room 16m2

D3: nurse room 16m2
E3: psychologist psychiatrist room16 m2
F3: common area



Building 1

0 5 10 15 20



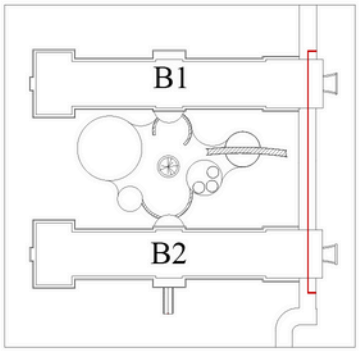
Building 2

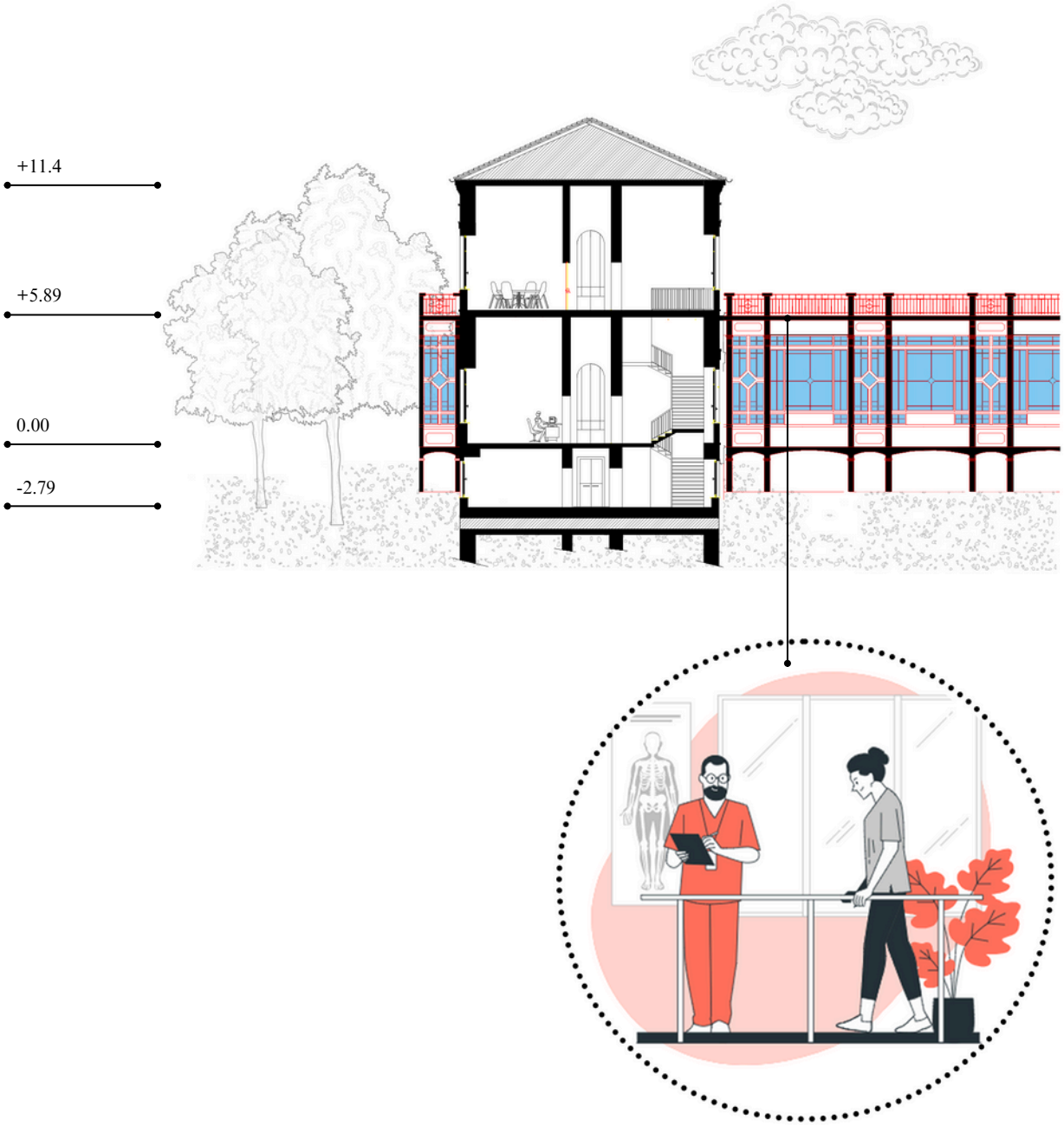
G3: vertical circulation
H3: terrace 23 m2
I3: patient room
J3: green wall hall
K3: pharmacy

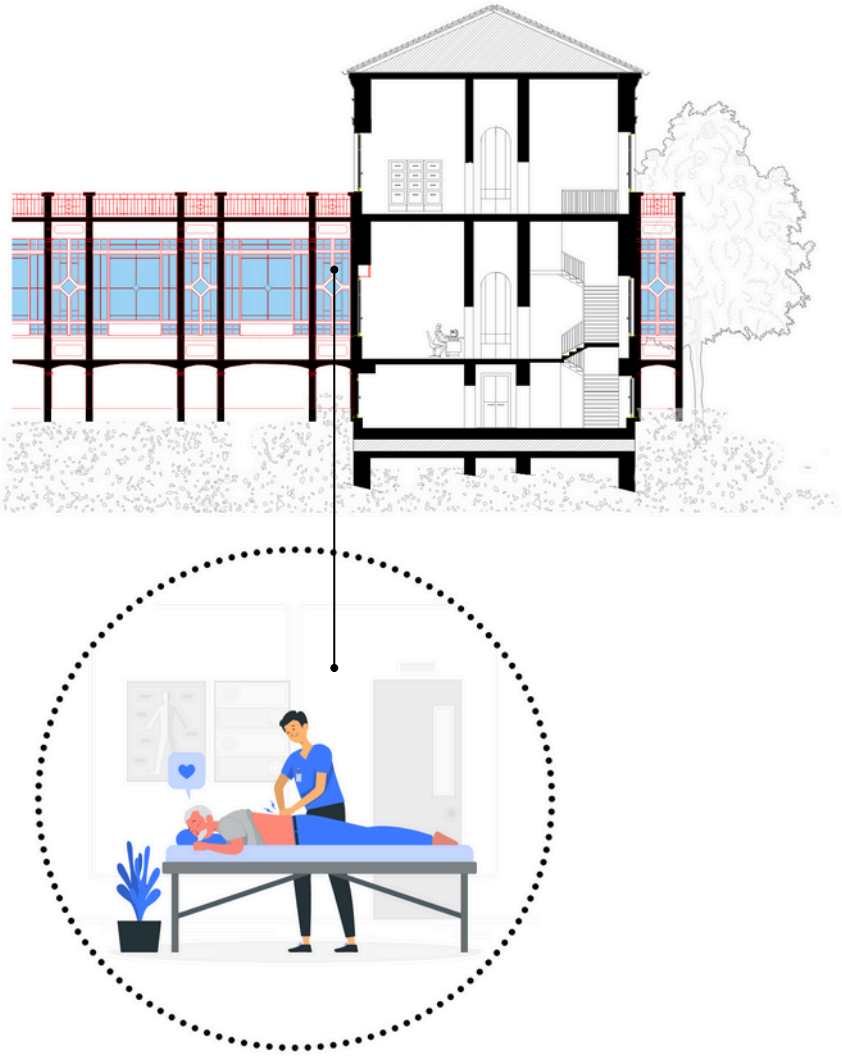
L3: walking activity
bridge open area

6.6) PROPOSAL SECTIONS

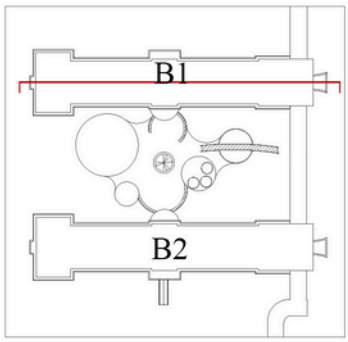
Section A-A



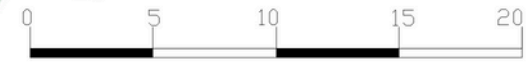


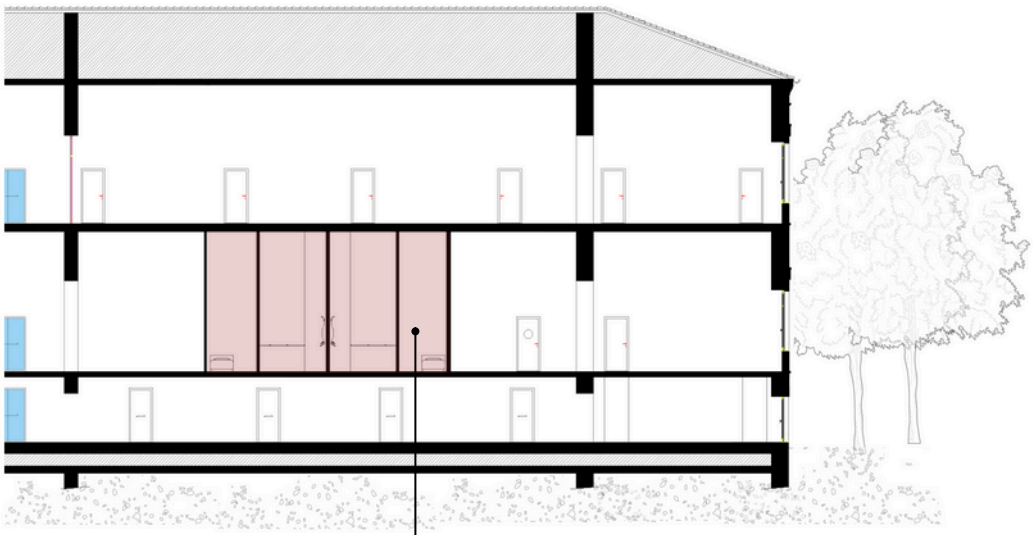


Section B-B



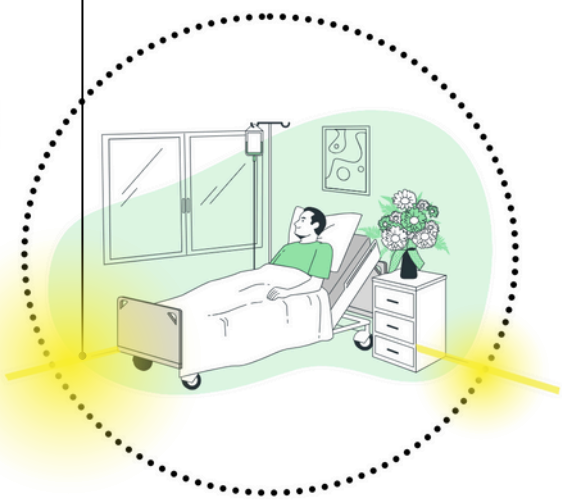
patient room wc



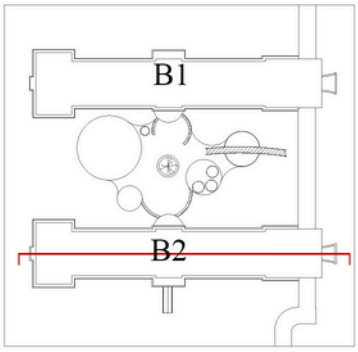


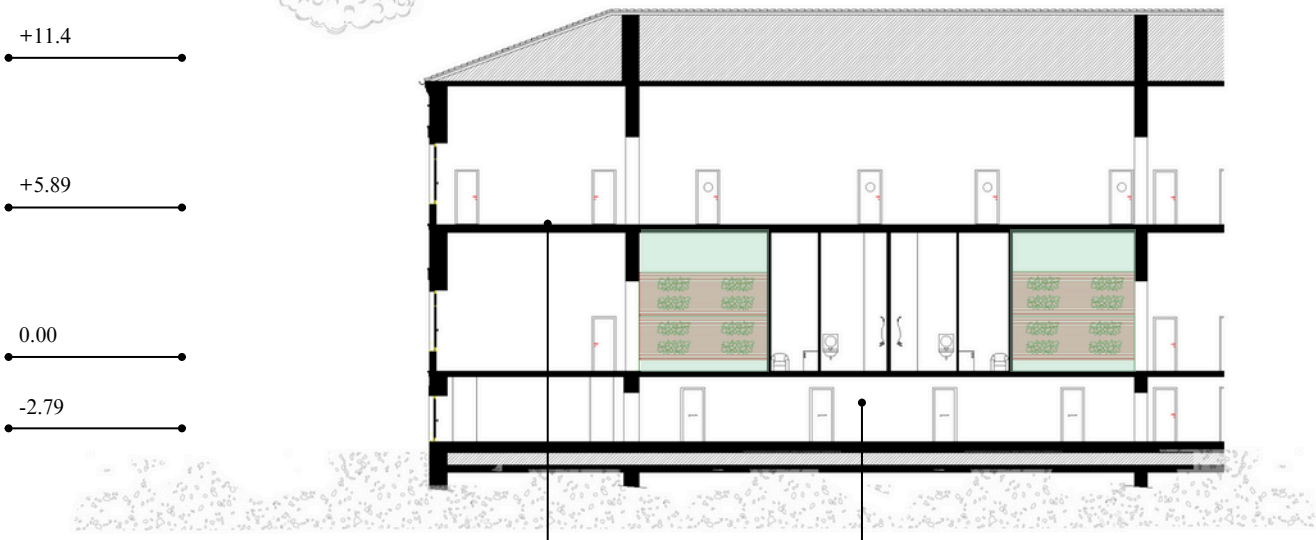
patient room

floor lights



Section C-C





green wall

green hall

green floor

6.7) CONCLUSION OF DESIGN PROPOSAL

●what is the impact of **architecure** on **human being?** ● can architecture be **a medicine** for **patients?** ●Is it possible **to acclerate the healing?** ● architects **must** study medicine.● architects **must** care. ● a **specific design** for specific **sick.** ● **spine injury.** ● motor skills/problem solving /mental health/ senses ● plant is the **machine .** ● **hospital** with a garden or **garden** is the hospital?

This thesis followed a clear, structured methodology consisting of **research, survey, and design proposal** that is in the level of prototype**.**

Through extensive research with the relationship of human and architecture, the history of the hospital and healing gardens as therapeutic architecture, the specific needs of Spinal Cord Injury (SCI) patients, as well as the architectural requirements for rehabilitation spaces, were identified. Furthermore through interviews and surveys, the study gathered valuable insights from experts, stakeholders, and potential users, ensuring that the proposal responds to real needs rather than abstract ideas. Following the research and survey phases, a design proposal as the prototype was developed to verify the applicability of the design in a real context which investigates the potential of transforming the "Ex-Ospedale Militare Alessandro Riberi" into a hospital dedicated for Spinal Cord Injury (SCI) patients.

Finally, the design proposal presents a functional prototype that investigates whether Alessandro Riberi can effectively serve as a new idea of hospital for SCI patients in order to **re-use** area with the **reactivation** respecting its **cultural heritage.** The results prove that it can respect the items below;

- **Cultural Heritage Preservation and Area Reactivation:** The Alessandro Riberi complex is not only an important architectural site but also a historical symbol of Turin. This design proposal suggest to transform the area into a modern healthcare facility, protecting its historical identity and function with a new approach and reactivation of the abandoned parts of Riberi. In this respect, it is not just a building design but a real example of how historical structures can be adapted to meet modern healthcare needs. At the same time, it introduces a new approach to treating Spinal Cord Injuries (SCI) by combining healthcare services with cultural heritage preservation and social inclusion.
- **Size and Existing Infrastructure:** The former military hospital is a complex, originally designed for medical purposes. Its scale allows for the new creation of specialized spaces such as therapy areas, patient rooms, social zones, stuff rooms and most importantly, accessible circulation paths, all of which are crucial for SCI patients. The building has a horizontal layout as it is a pavilion. Although the building is not a single storey, it is open to new accessibility solutions (e.g. elevators at the entrance and inside to make life easier for disabled people).
- **Healing Garden and Outdoor Space:** One of the project's central elements is the healing garden that is a proven therapeutic tool in SCI rehabilitation. The existing green areas of Alessandro Riberi are huge and underutilized. Integrating this garden with a new approach into the proposal design promotes; physical rehabilitation spaces, activity and greenery areas that created both inside and outside of the building, enhances mental well-being and also that can restore lost sensation and muscle strength that helps accelerate

healing process in line with modern healthcare architecture principles and technology.

- **Accessibility and Rehabilitation-Oriented Design:** The proposal includes a complete renovation of accessibility features, such as wide circulation routes, therapy bridges, and easily navigable spaces both outdoor and indoor spaces such as vertical platform lifts and floor lightened hospital rooms. These interventions are not abstract concepts but are carefully chosen architectural solutions that specifically address the mobility challenges of SCI patients. The design also includes specialized facilities like hydrotherapy pool, gardening, a bridge over a shallow pool, designed to make walking more enjoyable for

people with muscle weakness and/or disabilities, electromyography (EMG) rooms; to aid in motor recovery.

- **Social Impact and Future Potential:** Beyond its physical design, this proposal also addresses important social needs. It improves healthcare services for people in need, especially people with disabilities, brings abandoned spaces back to life, and protects cultural heritage. At the same time, it raises social awareness about the challenges faced by people with disabilities, not only in society but also within healthcare environments. If successful, this proposal can serve as a model for similar initiatives in Italy and Europe, showing how historical buildings can be sustainably transformed to meet modern healthcare needs and make healthcare available and accessible for all.

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