

A HUMANIZING HEALTH CARE TEACHING HOSPITAL IN MEXICO

Elliot Paul Rothman



Elliot Paul Rothman, AIA

Elliot Paul Rothman is Chairman of Rothman Partners, Incorporated, a firm he founded in 1969. He served as Associate Professor of Architecture at the Harvard Graduate School of Design from 1967 to 1969. With degrees in architecture, city planning and urban design, Elliot's career has focused on urban teaching medical centers and research laboratories. His international healthcare projects include a new teaching hospital for Universidad Panamericana, Mexico City and the Asian Eye Institute in Manila. Within the United States, he was Project Director at Rothman Partners for the Bebrakis Health Sciences Center, providing teaching space for students in the allied health sciences and teaching laboratories for the University.

I. STRESS REDUCING DESIGN STRATEGIES AND TOOLS

Stress reducing design strategies for the future Universidad Panamericana Medical School Hospital depend on cultural familiarity, a sustainable environment, and hospitality to assure comfort and healing for inpatients and outpatients.

Stress reducing design starts with the ethics of the healthcare system. This ethic will permeate the teaching environment, infuse a system of clinics that serve the poor, and culminate in the teaching hospital.

Universidad Panamericana, a private university in Mexico City, provides professional healthcare education within a profound human and ethical formation, fostering hospitality in patient care that reduces stress. The strategies employed to reduce stress relate to the philosophy of Universidad Panamericana's School of Medicine, its concept of patient service, and its commitment to foster this philosophy in a new teaching hospital. The University created its medical and nursing schools in 1996. Their strategic plan encompasses a health care system that includes a university hospital and urban and rural satellite clinics.

The Universidad Panamericana School of Medicine has many affiliations. Government agencies include the Secretaria de Desarrollo Social (SEDESOL), Secretaria de Educacion Publica (SEP), Secretaria de Comunicaciones Y Transportes (SCT), and



South Elevation, Universidad Panamericana School of Medicine



North Western University Students in Tlapa

the Secretaria de Salud (SSA). Foundations include the Mazahua Foundation, the Zabalketa Foundation (Spain), and the Medicina Asistencia Social Foundation (MAS). Internal to the University are faculty physicians, m23medical students and other schools of the University including its esteemed Schools of Business, Law, and Hospitality. Volunteer organizations such as the MAS Foundation forward the Medical School's agenda. The Universidad Panamericana School of Medicine Teaching Hospital is part of the CLFPHS system of Mexican Hospitals.

The Medical School is international in scope, and includes an affiliation with the University of Navarra and its Hospital in Pamplona, Spain.

Universidad Panamericana's Medical School and Nursing Schools extend themselves by sending students to many international locales for learning and training. Students are educated at Baylor College of Medicine (Houston), Northwestern University (Chicago), Tufts University Medical School, and Harvard Medical School (Boston) and the University of Navarra (Barcelona) among other venues. Students from the American Universities travel to the Universidad Panamericana clinics to study and deliver medical care, experiencing medical practice in an impoverished community. On-site education, long distance learning, and the benefits of international communications provide enhanced resources required for telemedicine, diagnosis and treatment.



II. UNIVERSIDAD PANAMERICNA NETWORK CLINICS

Prototype for the Clinics

Universidad Panamericana commissioned Rothman Partners Architects to design a prototype for its system of clinics for the most indigent populations of Mexico. Universidad Panamericana's medical and nursing students staff this network of clinics that serve the indigent population surrounding Mexico City and in the south.

Rothman Partners Architects developed the prototypical concept for the clinic. The Clinic in Tlapa was occupied. Universidad Panamericana staff provide modern patient care, respond to the culture of patients and visitors, treat patients with dignity, and work within a functional plan that facilitates modern flow of patients, physicians, nurses, staff and materials. Program elements include Emergency (with full service in Phase 2 construction); Radiology and Imaging; Laboratory; Obstetrics and Gynecology; Adult Medicine; Mental Health; Dentistry; Ophthalmology and Otolaryngology; and Pediatrics and Immunization. Merwyn Bagan M.D. MPH, FACS, Consultant, stressed the need for a separate area for immunization



located in the main courtyard.

Because funds are raised over a long time period, the clinic needed to be built in phases. The Clinic also required internal flexibility to change over time. The first phase of construction was designed to include trauma, radiology and an examination and treatment area, all organized around two public spaces conceived by Rothman Partners Architects. An external plaza and a walled courtyard, both traditional and familiar spaces in Mexico, were designed to be partially covered in order to shield patients from the intense sun.

Interior and exterior spaces were conceived as "green" spaces used to conserve energy and reduce impact on the environment. The design reduced stress because spaces were familiar, comfortable and culturally relevant within the context of contemporary design, typical of Mexican modernism. A large plaza introduces the main entrance. Once inside, patients and their families also enjoy a large private courtyard where Immunization is located. Both provide gathering spaces and open spaces that help reduce stress for patients waiting for diagnosis and treatment.

Rothman Partners Architects proposed design guidelines that use indigenous materials in innovative ways. We designed the structure

with laminated wood trusses supporting a clay tile roof. The design prototype proposed exposed galvanized steel columns on pier footings. The exterior walls are made of double wythe concrete units of a type commonly used in the area as underlayment for stucco. Instead of covering the masonry though, we chose to expose it and devised a coursing pattern that gave richness and interest to an otherwise very modest material. We designed windows to be operable, with screens. Procedure rooms are clad with locally made ceramic tile. Typical floors were designed with 30 cm x 30 cm cement tiles, mud-set. The final build-out of all phases is approximately 20,000 gross sq. ft., 1,948 M2.



Phase II



Section A-A



Phase III



The Tlapa Clinic, Tlapa, Guerero, Mexico, (MAS Foundation)

The first clinic was built at Tlapa. Funded by the MAS Foundation. The Foundation built a new medical clinic to displace its former inadequate facilities. Tlapa is one of the poorest and most arid regions of Mexico with a catchment area of about 600,000 people, many of whom speak only Indian dialects.

Arq. José Luis Razo implemented the final design application for the prototype at Tlapa. Although some changes had to be made to fulfill Mexican regulations, the essential program elements were included. A total of 1,064 m² was constructed; 884 m² is to be added. Land area totals 5,052 m².

The Friends of the Tlapa Clinic, an extraordinary volunteer group, is comprised of concerned women in Mexico City. Most travel monthly to Tlapa. The Friends teach nutrition and help the Indians learn to cook nutritional food, using the scarce crop resources available, malnutrition being a serious and rampant disease.

The Toshi Clinic, Atlacomulco, Estado de Mexico (Mazahua Foundation)

The Toshi Clinic, recently completed, is located two hours northwest of Mexico City and is a smaller version of the Tlapa Clinic. It too follows Rothman Partners Architects' guidelines. Its successful courtyards and spaces are very comforting and responsive to Mexican sensibilities, modern in its architecture. Arq. Juan



Entry to Classroom, Tlapa Clinic



Patient Courtyard to Examination Rooms, Tlapa Clinic

Alberto González designed the clinic. **Future Plan for the Clinics**

Each of the clinics has flexibility to grow. The Universidad Panamericana School of Medicine will enhance telemedicine capabilities in order to facilitate teaching, diagnosis, and improve outcomes. They will construct the second phase of the Tlapa Clinic for surgery. Two to three more rural clinics will be built. Other schools of the University will become involved. Students from North America, including students from Northwestern University and Harvard Medical School, will travel to learn from the poor.

Often funded by private philanthropy, these clinics are part of the caring system that Universidad Panamericana fosters. The Mazahua Foundation supported the Toshi Clinic, completed in 2003.



Approach to Toshi Clinic



Courtyard, Toshi Clinic

III. THE CONCEPT FOR A NEW UNIVERSIDAD PANAMERICANA TEACHING HOSPITAL

The clinic prototype provided the basis for Rothman Partners Architects design concepts for the new Universidad Panamericana Teaching Hospital in Mexico City.

The University will construct a new 130-bed teaching hospital. The new hospital will internalize the values of the University and its Medical School, creating a spiritual and physically therapeutic environment for its patients, visitors and staff. Many of its patients include the emerging middle class seeking a more responsive private care model than the public system affords. The Medical School currently is in the process of recruiting chiefs, faculty and staff.

IMEC International is Universidad Panamericana's Strategic Consultant, with Rothman Partners as Master Planner and Architect.

Models and prototypes influencing the Hospital Design

The School of Medicine relies upon its Mexican and Spanish culture, its spiritual support, and its international medical student exchange to achieve its goals. The University of Navarra Hospital in Pamplona, Spain, for example, provides paradigms for hospitality.

The University of Navarra, in Pamplona, Spain is a model for hospitality by the policies and procedures its laundry and dietary departments follow.

Martha L. Rothman, President of Rothman Partners Architects (RPA), Elliot Paul Rothman, Chairman of RPA, and Gabriel Yaari, Principal of Design for RPA toured the University of Navarra Hospital in Pamplona. They observed several characteristics, which reinforce the concept of a caring environment. The nursing service had a caring professional style with high morale. The support services truly enhanced the caring environment at a level of hospitality that was indeed unique in a hospital.

• Dietary

As visitors, Rothman Partners Architects entered the Navarra Hospital kitchen on ground level where a cook was neatly cutting steaks from a fresh swordfish. This immediately suggested that the institution cared about its patient's culture and diet. The fish was fresh and the meal was to be prepared using natural ingredients.

Next we observed the workflow. Dietary administration created a computerized meal ordering system that permitted staff to identify special characteristics for each food tray. An assembly line with four or five staff members assembled each tray and visually inspected the quality. The cooked food was sent by elevator to the patients on heated carts.

In a typical hospital, patients complain that they cannot obtain food between meals when they become hungry or thirsty. The University of Navarra Hospital adopted a ready supply food service process that provides each patient an immediate response to their off schedule food requests. A ready supply refrigerator in dietary is located next to a dedicated dumbwaiter. Upon request for a snack from the patient or the patient's caregiver, a computerized note is immediately sent to a dietary staff member who fills the

request and returns the order by dumbwaiter. Accompanied by computer notification, the meal is then served.

• Laundry

It is important that patients wear dignified apparel. To achieve that goal, Navarra has a full service laundry where it designs and sews its own non-revealing patient gowns. Infants were not only swaddled in diapers, but also covered comfortably with shirts, pants and dresses that all of us, as parents, would want to see our infants clothed in, all made by seamstresses in the laundry service. The seamstresses also fabricated hospital uniforms, differentiating each group by harmonious pastel colors. All staff members were proud of this special attention and variety. Linens and special garments were carefully pressed by the most advanced machines. Navarra's laundry staff was not relegated to a dingy lifeless basement. The facility was on grade with windows providing views and natural daylight.

THE PROGRAM FOR THE UNIVERSIDAD PANAMERICANA TEACHING HOSPITAL

Features for Stress Reduction in a New Teaching Hospital

Through IMEC, International, Strategic Consultant, the Universidad Panamericana School of Medicine invited Rothman Partners Architects to develop a new teaching hospital committed to patient care in a healing environment. The new medical school sought excellence in medical care, within a new therapeutic physical environment. As in the Clinics, The Universidad Panamericana School of Medicine and the University draw upon their basic Mexican/Spanish culture for strong spiritual support, international medical exchange, and international design resources, all to achieve their goals.

Descriptions of the New Hospital

The existing medical school campus is located at the site of the original University, formerly a hacienda located in the southwest area of Mexico City.

The new teaching hospital is planned to be located in a valley distant from the main campus. The Medical School anticipates an ambulatory care and in-patient facility that can be phased as funds become available. Academic Chiefs of Departments, teaching physicians, nursing educators and nurses will participate in planning as part of the medical community. The space program currently includes Ambulatory Care Facilities, the Radiology and Imaging Technologies Center, an Emergency Department, and an Ambulatory Patient Surgical Suite that will also serve in-patients in later phases. Approximately 120 to 130 beds will be constructed in phased construction.

The teaching hospital reflects the values of Universidad Panamericana and physical characteristics of its campuses. Features include landscaped and paved courtyards, well-scaled outdoor spaces, unity of color, art, and detail in the classrooms themselves. Rooftop terraces for dining, also important in the Universidad Panamericana Business School, are included in the hospital design.

Rothman Partners Architects designed innovative patient floors. On-line education for medical and nursing students is included at each patient floor. Information systems and computer technologies are drivers for a small medical school, because they link students to international information that simulates patient cases they would not ordinarily experience. Computers are located in each patient room to facilitate information transfer and work orders, reducing the role of the traditional nursing station. As a result, nurses and doctors will spend more time with their patients.

Rothman proposed a patient floor of about 28 beds to 30 beds for each nursing unit. Individual occupancy is favored in the Mexican culture just as it is becoming the standard in U.S. hospitals. Sitting and meeting areas in the corridors that allow natural light separate groups of 4 to 8 beds and eliminate tedious corridors. This bed arrangement provides flexibility in the assignment

of inpatient rooms. Organized for personal care nursing, one key nurse is responsible for a patient during his or her entire stay, providing continuity, coordinating other staff, fostering hospitality and reducing stress.

The team recognizes that a teaching hospital operates with a high ratio of nurses to patients. The ratio is based on acuity of patients and the time required to teach medical and nursing students about each patient. Unique to this hospital is the extent of teaching space on each floor, including computer work space, small case rooms and meeting space.

Due to the steeply sloping site, architectural monitors bring natural light into conference and seminar rooms that are located against the hillside.

The program includes a chapel for 200 people for the spiritual health of its patients. The chapel, located at the entry to the courtyard, inspires patients about the role that spiritual comfort plays in medicine, in wellness, in stress reduction, and in cultural associations with healthcare from birth to end stage illness.

New Patient Rooms

In the United States, there have been many studies of in patient rooms similar to Northwestern University's new patient room, valued by Universidad Panamericana as a model. The patient rooms at Universidad Panamericana will include a work zone for the physician and nurse, a toilet room with shower, the patient bed area, and a sitting area for family members whose presence and assistance serves to reduce stress. Rothman Partners Architects developed a sleeping alcove next to the outdoor balcony in each room for a family member. All rooms face southerly. Balcony and alcove respond to the climate and the large role that Mexican families play in hospital-based healthcare.

Outpatient/Ambulatory Care Facilities

A strong outpatient model requires wayfinding and efficient work flow. Examination and consultation



*Balcony South
Patient Bedroom Conceptual Sketch*

rooms are designed to be large enough for educating medical and nursing students and family members. Inpatient rooms should be exposed to natural sunlight. The patient environment should be designed for hospitality, comfort and reduction of stress. Rothman Partners Architects presented their innovative prototype for examination and diagnostic rooms when they presented their design of the Carl J. Shapiro Clinical Center at Beth Israel Deaconess Medical Center, Boston, at the Design and Health World Congress at Trondheim, Norway in 1997.

THE MASTER PLAN FOR THE UNIVERSIDAD PANAMERICANA SCHOOL OF MEDICINE TEACHING HOSPITAL

Understanding the Existing Campuses

Early in the planning phase, the team took long walks through two of Universidad Panamericana's campuses - the Academic/Medical School campus and the Business School campus. These walks

made a lasting impression and taught the design team valuable lessons about the disposition of buildings on the land, the picturesque relationships generated, the absence of formal axis as a means of organization and, above all, about the essential part outdoor spaces play in establishing a sense of place for an entire community.

The Site Mission

In their preliminary design, Rothman Partners Architects incorporated the lessons learned from the tours. The designers intend to create spaces and buildings that are specific to Mexico City and its hilly terrain. The team's objective was to generate an environment that fulfills the mission of the departments of the hospital in an efficient and practical manner. Designs were to be consistent with the dedication of the institution to the most advanced practice and instruction of medicine. The team introduced an environment of human poetry, believing that functional environments must be elevated through design to perform the healing objective.



Courtyard Showing Thematic Red Paint and Stone Walls

Design Strategy

Although the new hospital will be built in several phases, determined by financial and demographic projections, the design team's approach was to envision it in its completed totality. The design master plan envisions the hospital in its entire program for the facility, giving specificity to each department and unit, its adjacencies, public and private movement, and to access by vehicular circulation.

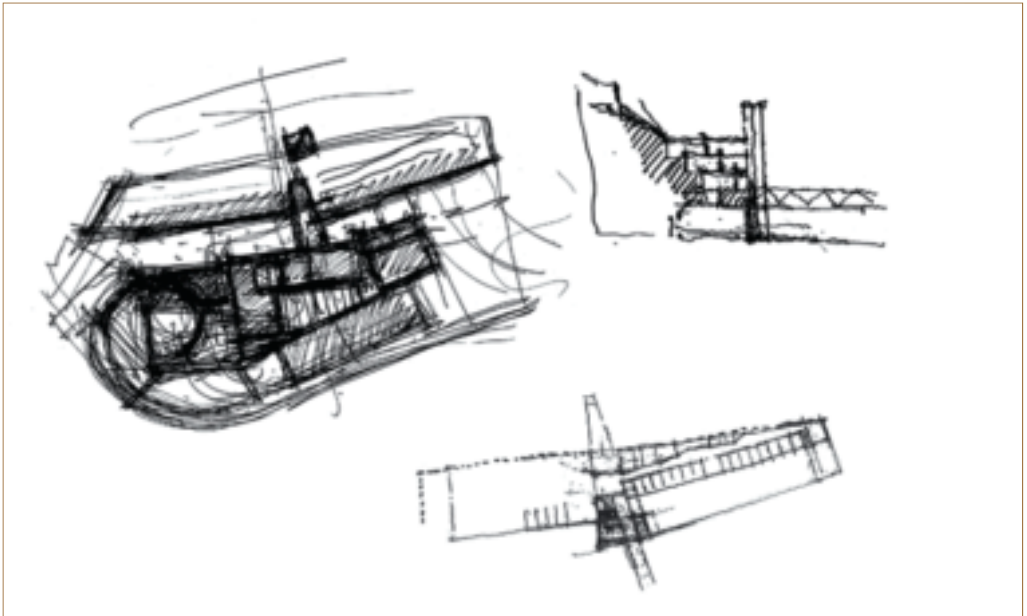
Environmental considerations led the team to engage the natural site. Site design envisions a switchback road from the top of the hill to the relatively flat valley below where the majority of the medical functions and their support services are to be located. Visitors and patients can enter the hospital by automobile, via the hillside road, connecting to tiered, surface parking; or, they can enter from the top of the hill through an upper lobby and an elevated walkway to elevators.

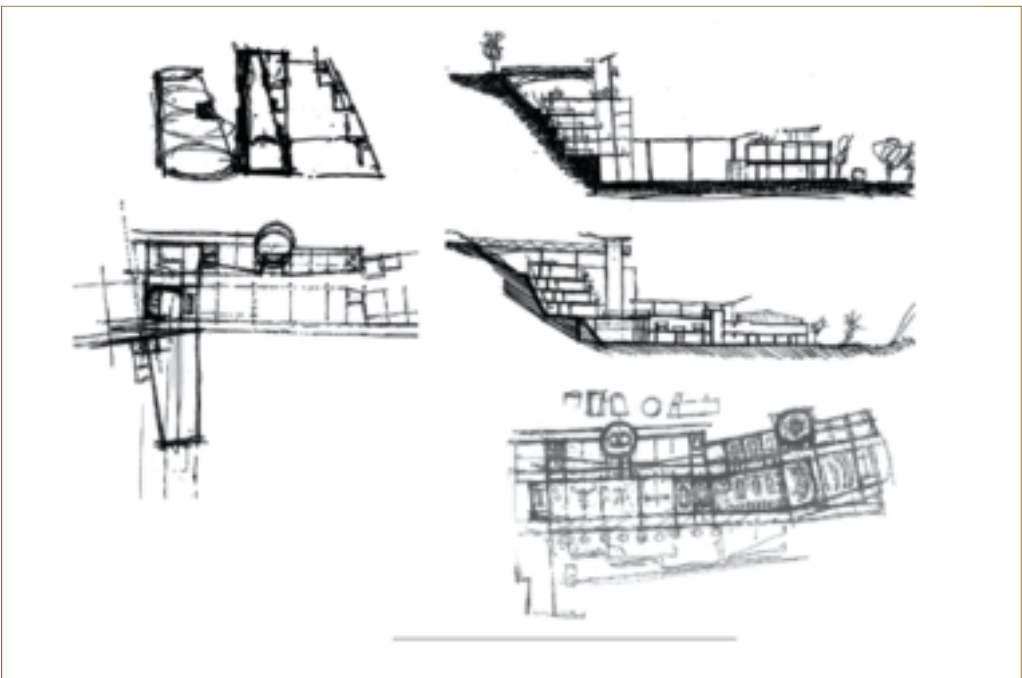
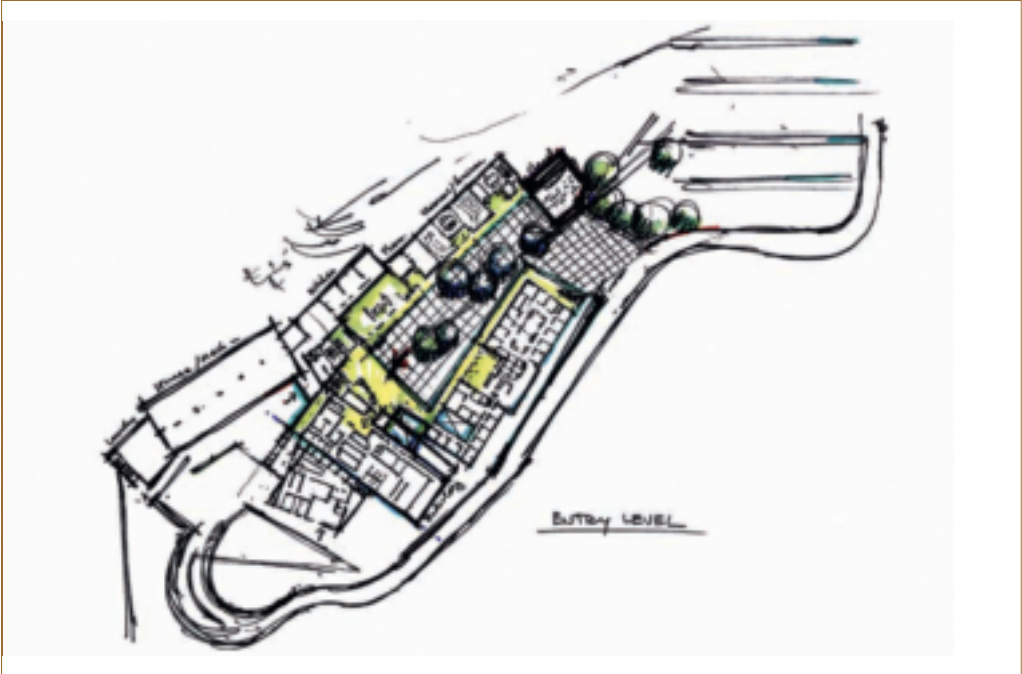
The design proposes several interconnected buildings surrounding a landscaped plaza at the floor of the valley. A traditional plaza recalls the historic cloistered hospital. The plaza is trapezoidal in shape. Its long axis is oriented north-south. Clearly identified buildings to be developed over time surround an urban plaza. The design approach is very different from a North American hospital that expands from a central core building by adding wings and extensions.

Buildings surrounding the plaza contain specific activities: To the west – the ambulatory care and outpatient clinic; to the north – the radiology department and beyond it, the emergency unit (with its own entry and ambulance court); to the east – the café/restaurant, the pharmacy and education programs; and to the south – the chapel that prominently articulates the entrance into the Plaza.



New Terrace Facing Hacienda of Original







Master Plan



Transverse Section A-A



Transverse Section B-B

EastWest Cross Section

EastWest Cross Section

The organization of activities takes advantage of the steeply sloping terrain. Inpatient bed floors are set into the shoulder of the hill stepping up gradually. All patient rooms face southwest, each with a balcony.

The configuration of the hospital bed floors deliberately avoids endless and oppressive corridors; instead, it organizes a group of rooms that align a gently curved corridor. Rooms and other spaces include nurse's sub-stations, communal rooms, solaria, and support space. Natural light permeates circulation spaces through these communal rooms located at the west and southwest. On the "blind" side of the hill, truncated conical light wells, the full height of the building extend above the top of the hill and illuminate a signature skyline.

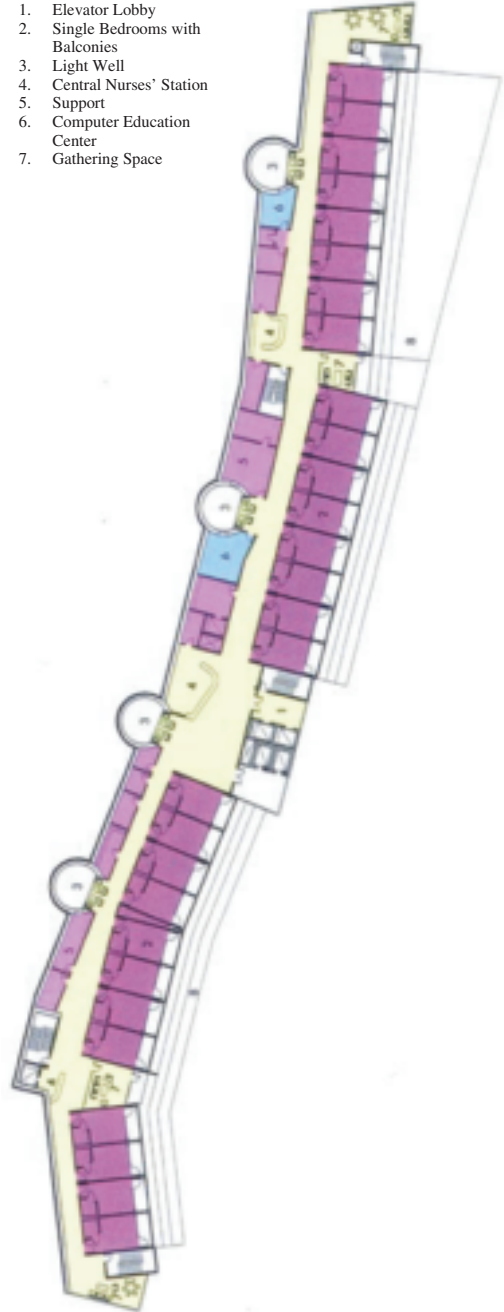
Administrative and doctors' offices occupy the top floor of the east building, affording views over the entire complex.

Within the plaza, the main loggia facing south creates a strong public image without attempting to be monumental or overpowering. Two and a half stories high, it will be sheathed entirely in glass and be protected by a deep overhanging roof supported on steel columns. The loggia's transparency acts as a visual foil and the chapel located opposite.

One approaches the chapel from the courtyard level by walking up a processional ramp. The chapel is a place of introspection and prayer. Its solid walls are clad in stone. Natural light flows inward through a large oculus. The oculus forms a dome over the worshippers, conveying a sense of community within a large religious space.

Within the Universidad Panamericana Teaching Hospital Campus, massing, articulation of the buildings forms, and natural materials respond to the region's climate. They embody the culture. They mirror examples of local architecture – both vernacular and modern. Overhangs, pergolas, galleries and porticos provide shelter from the sun. Ranges of trees, flowering plants and lawns extend the natural environment one encounters in Mexico City.

1. Elevator Lobby
2. Single Bedrooms with Balconies
3. Light Well
4. Central Nurses' Station
5. Support
6. Computer Education Center
7. Gathering Space



In-Patient Floor Plan



Model of Universidad Panamericana Medical School Teaching Hospital

CONCLUSION

Excellence in design, caring physicians, nurses and allied health professionals all reduce stress for patients and families at the Universidad Panamericana School of Medicine teaching hospital. Caring reduce stress. A caring physical environment reduces stress. The Universidad Panamericana Teaching Hospital fosters clinical

and spiritual well-being. It generates an ethos where caring medical and nursing students learn to mitigate stress. Long after they graduate, Universidad Panamericana's medical and nursing students will benefit from the holistic approach the design embodies. This new teaching hospital in Mexico City will enhance wellness and reduce stress among patients, families and staff.



*Pirámide del Sol, Teotihuacán, Mexico
Work on Paper by Elliot Paul Rothman, July 2001*