

# Surgery in Mexico

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**T**he oldest representation of a physician in our country can be found at the Museo de Antropología in Mexico City. It stands 9.5 cm tall and dates from 1500 BC. Little is known about surgery in our country before the appearance of the Mayan and Aztec cultures. Texoxotla-Ticitl was the surgeon of that time; he knew how to heal everyday diseases and injuries that resulted from the frequent wars. Surgical experience consisted mainly of draining superficial abscesses, which were then washed with urine and covered with lime and herbal medicine cataplasms. Suppurative mastitis was relieved by drainage with the use of obsidian knives, and these instruments were also used for circumcision and longitudinal penis mutilations, which were requirements for entry into the priesthood caste (300-800 AD). Pterygium surgery was performed with agave thorns.

Wounds were classified according to extent. For example, *tacolli* indicated any wound; *temotzoliztli*, scratches; *vistli*, contuse wounds; *tlaxipeualiztli*, sores; *teixiliztli*, puncture wounds; and *tlaxilli*, severe penetrating wounds. Wounds were healed by instilling tree bark sap, root juices, wax, and egg yolk (which was later discovered to have fibroblast-stimulating properties).

A surgical area in which great expertise existed was in the repair of bone fractures. Wounds were sutured with hair or vegetable fibers. Pain (from the wound or the treatment itself) was controlled using plants (*toloache*, peyote, and hallucinogenic mushrooms); and hemorrhages were contained with a plant known to them as *matlaliztic* (*Commelina pallida*).

European medicine was introduced into Mexico after the conquest of Tenochtitlan in 1521 and was influenced by the 2 most important Spanish universities of the time: Salamanca and Valladolid. In 1524, Hernán Cortés founded the first hospital of the American continent, Hospital de la Pura y Limpia Concepción de Nuestra Señora (Hospital of the Pure and Immaculate Conception of Our Lady), which later became known as the Hospital de Jesús (Hospital of Jesus), and is still in op-

eration. The location on which it stands is where Montezuma, emperor of the Aztecs, and the Spanish conqueror Cortés first met in 1519. The director of the hospital and first surgeon of Mexico City was reportedly Diego Pedraza from Sevilla, Spain.

Since the growing population needed physicians, the Franciscan friars inaugurated the Imperial Colegio de Santa Cruz (Imperial College of the Holy Cross) in Santiago Tlatelolco and created the first school of medicine in 1536. Four years later, Friar Vasco de Quiroga founded the Colegio de San Nicolás (College of Saint Nicholas) in Nueva Valladolid (Morelia, Mexico) where medicine is still taught. The first Mexican physician, Martín de la Cruz, graduated from the Imperial Colegio de Santa Cruz and published the first book on pharmacology in the Americas, known as the *Libellus de Medicinalibus Indorum-herbis*. It was translated by another Mexican, Juan Badiano, in 1552, and is currently known as the *Códice Badiano*.

The Real y Pontificia Universidad de la Nueva España (Royal and Pontifical University of the New Spain) opened its doors in Mexico City in 1553. It was a copy of the University of Salamanca in Spain and a precursor of modern universities in Mexico. However, it was not until 1575 that the first chair of medicine was created, and the first classes were taught in 1579.

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Despite these antecedents, it was not until 1620 that the chair of anatomy and surgery finally began teaching at the university. In 1719, the Viceroy of New Spain decreed that those who had studied medicine and wanted to work as physicians and surgeons needed to complete 2 years of internship in the Hospital de Jesús in Mexico City. Colegio Real de Cirugía (Royal College of Surgery) was founded in Mexico City in 1768 by order of Charles III, King of Spain. Its seal was the Real Hospital de Naturales. The country and its universities suffered ups and downs owing mainly to numerous social movements, such as the War of Independence from 1810 to 1821, the constant struggle between the liberal and conservative political parties, the war against the United States in 1847, the French Intervention with the imposition of the Austrian emperor in 1867, etc.

### CURRENT EDUCATION

Currently, there are 72 schools of medicine in the country, the most renowned being the Universidad Nacional Autónoma de México (National University of Mexico), the Universidad de Guadalajara (University of Guadalajara), the Universidad Autónoma de Guadalajara (Autonomous University of Guadalajara), and the Universidad de San Luis Potosí (University of San Luis Potosí). There are other schools, nearly one in each state of the country. Some of them have their own teaching hospitals, with residents in the surgical program evaluated by the state university. The current medical curricula needed to obtain a diploma in medicine includes 4 to 6 years of medical school, a 1-year internship in a university-approved hospital, and 1 year of social service in a rural community, a program that was established by the health authorities of the country to ensure medical attention to small communities that usually do not have access to medical services. A small group of outstanding students with a strong interest in medical research are allowed to fulfill social service requirements under the guidance of a medical investigator in a hospital where research is carried out.

Graduates may then take the professional examination after which they will receive their medical diploma, which enables them to aspire to a residency program. An annual examination sponsored by the Mexican government through its Ministry of Health is carried out for all those general practitioners who wish to enter a residency program in a different field of medicine. This examination must be passed to obtain a place in a residency program since the government pays for the training.

### PROGRAM

For practical purposes, there is only one general surgery program approved by the Universidad Nacional Autónoma de México that serves as a model. It consists of 4 years of training, which include the theoretical and practical aspects of surgery that need to be mastered by the resident to obtain the title of specialist in general surgery. The resident must then take a final examination to obtain this title from the university and take the Mexican Board of General Surgery examination to be able to

work as a surgeon. Every year, an average of 400 aspirants countrywide are evaluated. The specialist must then be recertified every 5 years by the Mexican Board of General Surgery to assure that he/she still has the aptitude to practice his/her specialty. The general surgery residency program offered at the Instituto Nacional de la Nutrición (National Institute of Nutrition), which depends on the Ministry of Health for financial aid, is an exception to this program. Candidates for the residency must undergo further psychological examinations and tests to determine their depth of knowledge. The program in general surgery is 5 years, after which one of the residents is offered the position of chief resident for 1 more year. Both the fifth year of residency and the year as chief resident are paid for by the institution.

### TRAINING SITES

In Mexico, the training hospitals at which a residency program in general surgery is offered must meet 1 of the following 3 criteria determined by the Ministry of Health of the federal or state government: (1) It must be one of the hospitals that falls under the jurisdiction of the Ministry of Health, which includes the National Institutes of Health. These are considered tertiary care hospitals that must offer patient treatment, teaching, the development of human resources, and basic and clinical research. (2) It must be one of the general hospitals in different cities where there is patient treatment, teaching, and possibly clinical research. (3) It must be one of the hospitals of the Mexican Social Security System and of the Institute of Social Security for Workers of the State with different levels of patient treatment, teaching, and research; a university of each individual state approves most of the teaching programs in these hospitals.

### SPECIALIZATION

Frequently, the young surgeon decides to further pursue surgical training in a more specific area, such as vascular surgery, neurosurgery, cardiothoracic surgery, etc. This can be achieved in different tertiary care university hospitals around the country or by a 1- to 2-year training period in a foreign country. The country most often selected for foreign training is the United States. Not all surgical subspecialties require a complete residency in general surgery (orthopedics, neurosurgery, urology, etc).

### THE WORK OF THE GENERAL SURGEON

The general surgeon in Mexico works basically in gastrointestinal surgery, neck surgery, and abdominal wall hernias. This is particularly true in large cities where all surgical specialties can be found, as in any developed country of the world. General surgeons who live in smaller cities may intervene in different surgical areas, depending on their skills and training.

Surgeons can be divided into 2 large groups: (1) Those who work in institutional hospitals where academic medicine is carried out. The surgeon in this group receives a salary, and no individual fees for operations are obtained. (2) Those who work full time in private prac-

tice in an office or private hospital (fees paid mostly by private insurance companies).

Many surgeons combine the 2 types of practice because the lower income obtained from an institutional hospital forces most surgeons who work in these hospitals in the morning to have a private practice in the afternoons.

### SURGICAL SOCIETIES

There are numerous associations and societies in Mexico whose memberships combine different surgical specialties. Among these, the National Academy of Medicine, Mexico City, which was founded more than 150 years ago, is considered to be the most renowned and has the highest entrance standards. Representatives of the medical and/or surgical specialties of the country are accepted after a strict selection process. There is also the Mexican Academy of Surgery, Mexico City, and the Mexican Association of General Surgery, Mexico City, whose members include a large number of the surgeons of the country as well as related specialists. Each year there are numerous academic meetings, which may be conducted locally (hospitals), regionally (states), or nationally, where different activities are provided with the objective of divulging, sharing, and teaching surgical

experiences. The most important meeting is coordinated by the Mexican Association of General Surgery and is held annually in November in a different city in Mexico. There are numerous foreign and national professors, and the meeting consists of symposia, discussion forums, clinical and research seminars, and several courses held within the meeting. The attendance is approximately 2500 surgeons.

General surgery and its subspecialties are carried out in Mexico as in any developed country, with the exception of organ transplantations, such as pancreas, heart, small intestine, lung, and liver. Kidney transplantations are routinely performed in many cities in Mexico. Although transplantations other than kidneys have been and currently are being performed, it is difficult to do them as frequently as desired for economic, legal, and social reasons. Nonetheless, the main reason why surgeons are constantly training in foreign countries, such as the United States and countries in Europe, is to be able to bring these surgical specialties closer to being routine practice in the surgical activity of Mexico.

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