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Semblanza histórica a 120 años del Hospital General de México Dr. Eduardo Liceaga

HISTORY ARTICLES

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HISTORY ARTICLE

Current situation: angiology and vascular surgery service

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Angiology and Vascular Surgery Service, Hospital General der México Dr. Eduardo Liceaga, Secretaría de Salud, Mexico City, Mexico

As of 2011, with an independent concept of heart surgery with the endorsement of the Mexican Society of Angiology, Vascular and Endovascular Surgery plus the creation of the *Universidad Nacional Autónoma de México* (UNAM) Postgraduate course, the first service was created with doctors specializing in Angiology, Vascular and Endovascular Surgery, integrated by doctors with a license and title of the specialty in charge of Dr. Miguel Ángel Sierra Juárez.

The functions of the service are based on attending to the entire population of the country with vascular problems; arterial, venous and lymphatic, except heart and intracranial territory, the human resources are made up of 5 attached doctors and 11 residents who are invaluable elements in the operation of the service: Dr. Amparo Quintana Aceves, Dr. Marlon Eduardo Lacayo Valenzuela, Misael Sánchez Tamariz, M.D., Taztzari Martínez Corina, M.D., Daniela Mabel Notabile, M.D., Alan Issac Valderrama Treviño, M.D., Fernando Guillermo Ramírez Estrada, Gerardo Martínez Estrada, Gerardo Martínez Méndez, M.D., Itaty Carolina González Martínez, M.D., Alejandro Oropeza Vaca, M.D., Luis Burgos, M.D., Diana de la Luz Bustamante Trujillo, M.D., Verónica Rubio Anaya, M.D., Angélica Espinosa Hinojosa, M.D., and Carlo Stefanoni Pérez, M.D.

From the moment of its creation to date, the service has transformed exponentially; it has always been characterized by receiving complex cases or with multiple out-of-hospital treatments. Traditionally-shaped procedures with vessel incisions (open surgery) are within the hospital's therapeutic arsenal. But since 2021, the free program led by the Presidency of the Republic, provided the support of Endovascular material. This allowed us to offer the population of our hospital the alternative of more modern treatments in vascular surgery, endovascular therapy is currently a more modern tool in the care of vascular conditions; we can compare its evolution with open cholecystectomy surgery, which is currently operated with small ports and less risk of morbidity and mortality for patients. Similar is the endovascular evolution. Initially, we had to operate with open surgery with very wide incisions despite being short lesions with prolonged periods of tissue ischemia, high risk for patients with comorbidities, and a greater amount of bleeding. Nowadays, endovascular therapy is free of wounds; everything is by puncture of small introducers, there are no prolonged periods of ischemia, serious patients can be operated on, and bleeding is nil, the service develops in many cases hybrid techniques that combine open surgery plus endovascular.

The training and skills of the staff have allowed them to have skills in endovascular procedures; It is difficult to mention all the advances and the territories served with the benefit of endovascular therapy. Today, it is the procedure of excellence worldwide and the General Hospital of Mexico is contributing a grain of sand by offering this tool to the most vulnerable population of the country that has low resources, allowing them to return, as soon as possible, to their activities. In the national congresses, the school of the General Hospital of Mexico is dressed in congratulations and admiration when observing the evolution of the service toward the application of technology. We have always been a benchmark for the complex management of vascular

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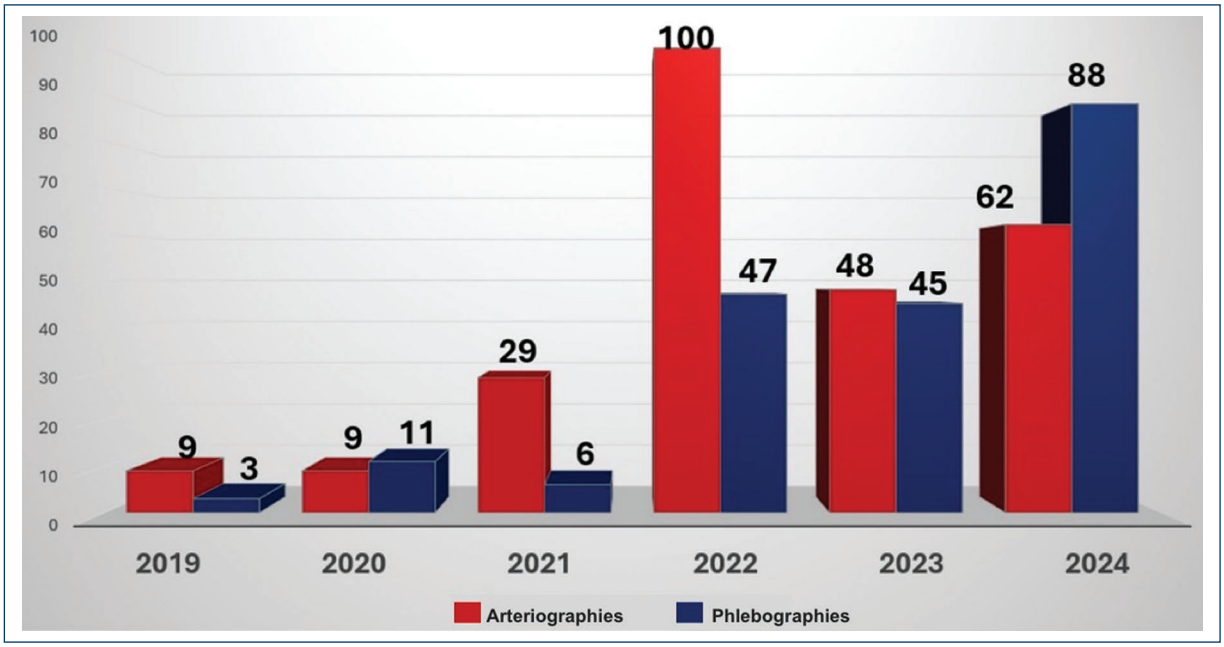

Figure 1. Diagnostic-therapeutic endovascular studies.

surgery, but now that we add technology, the results are better every day.

In figure 1, red columns, we analyze the arteriogram, diagnostic and therapeutic studies that add up to a total of 257 cases in 6 years, the largest number were obtained in 2022 when we have more surgical time in the hemodynamics room, The cases included here correspond to complex pathologies of the arterial territory resolved with endovascular therapy, cases of acute or chronic ischemia secondary to cholesterol plaques or thrombi that threaten the limb loss has been prevented with thrombus aspiration equipment, atherectomy equipment to remove plaques, balloon angioplasty and stent placement of various diameters with room controls through endovascular ultrasound, carotid stent placement, embolization of carotid Glomus for resection with less bleeding, treatment of traumatic arteriovenous fistulas, embolization of malformations, diabetic foot with macro angiopathy, mesenteric ischemia, renovascular hypertension, embolization of hypogastric etc. We present a case of a female patient who presents with arterial disease with ischemia of both extremities after several sessions of radiotherapy in the pelvis for cervical cancer. He comes with intense pain of both limbs when walking at 50 m with digital necrotic lesions. Angioplasty was performed with a medicated balloon, improving pain when walking, reaching a distance of more than 200 m without pain, and the ischemic lesions disappeared (Fig. 2)

In figure 1, blue columns, the report of phlebography, diagnosis and therapy is shown, which add up to a total of 200 cases in 6 years, the highest number of cases from January to September 2024, the results express complex cases of venous pathology, such as acute and chronic vena cava and iliac thrombi which have been resolved with thrombus, mechanical drug aspiration plus placement of a vena cava filter and in some cases, balloon angioplasty plus venous stents, thus avoiding mortality due to pulmonary embolism. In cases of chronic venous insufficiency (varicose veins), advanced management of modern techniques, such as laser, radiofrequency, sclerotherapy, and micro-incisions, improve the quality of life of patients, the closure of venous ulcers, reducing costs for re-interventions or rest days by allowing the patient a faster recovery. Complex cases of central vessel stenosis secondary to catheter use, pelvic venous disease with dilated veins in pelvic floor veins with leak points to the perianal and gluteal region, incompetence of gonadal strains, compressive syndromes of the left renal vein and left iliac vein, symptomatic, which with endovascular therapy, placement of coils plus foam with polidocanol or venous stent, patients have presented improvement in their quality of life, Post-thrombotic syndrome with the development of severe venous disease in the extremity,

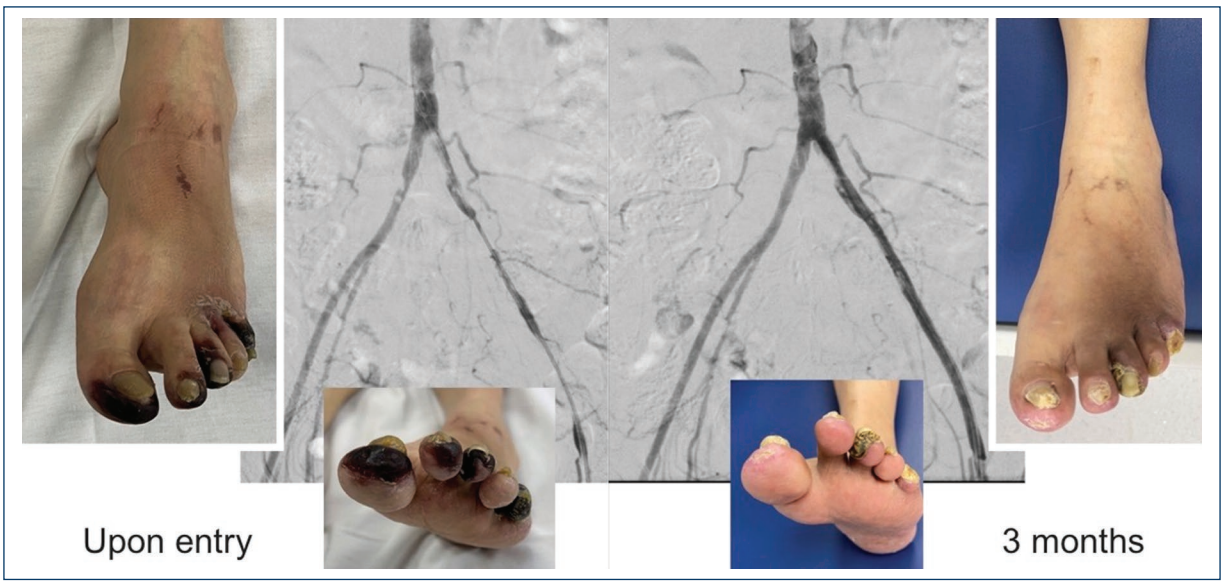

Figure 2. Presentation of the case of a female patient presenting arterial disease with ischemia of both lower extremities after radiotherapy sessions. Medicated balloon angioplasty with improvement of the ischemic lesions.

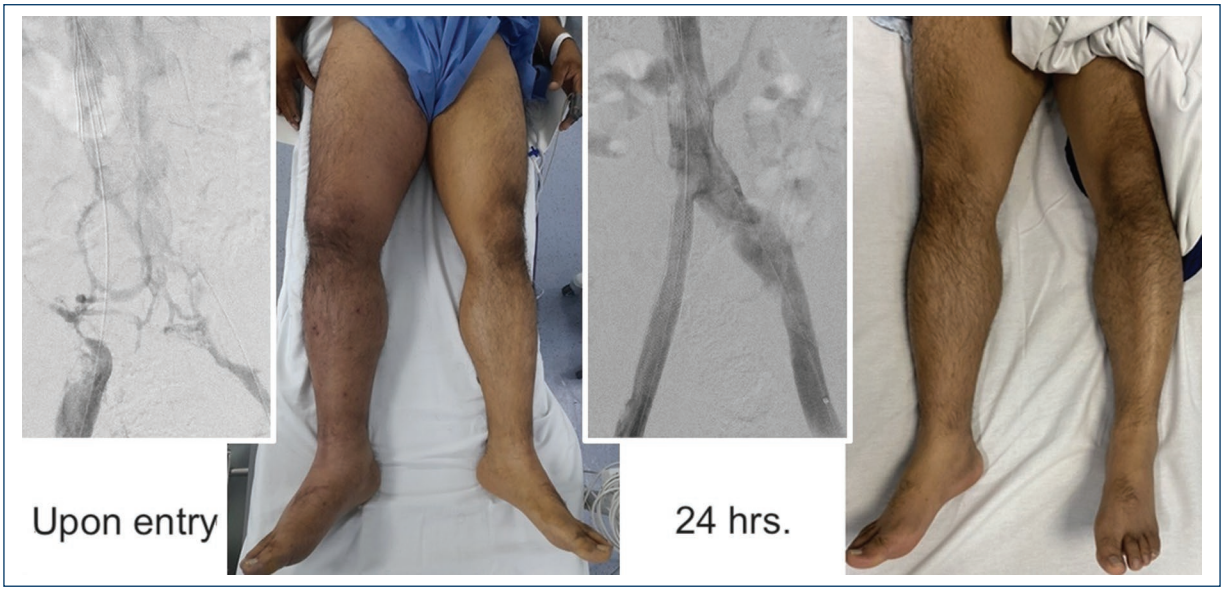

Figure 3. Patient diagnosed with venous thrombosis of the right leg (phlegmasia), removal of clots with a pharmacological mechanical thromboaspiration system, achieving total patency of the vein. Management on the floor and discharge at 24 hours with oral anticoagulation.

ochre pigmentation, edema, venous ulcer treated endovascularly with balloonplasty and more venous stent, improving the outflow and relieving the symptoms of patients, stenosis of arteriovenous fistulas where the path of the arm vein presents stenosis of the vessel secondary to recurrent puncture with balloons. We present in figure 3 a case of phlegmasia of the right extremity with severe venous involvement (tension edema, cyanosis, intense pain and decreased pulse) to complicate arterial flow with data of systemic shock and compromise of limb viability that was resolved with placement of a vena cava filter, removal of clots with thrombus system, pharmacological mechanical aspiration with injection of heparin plus thrombolytic pressure

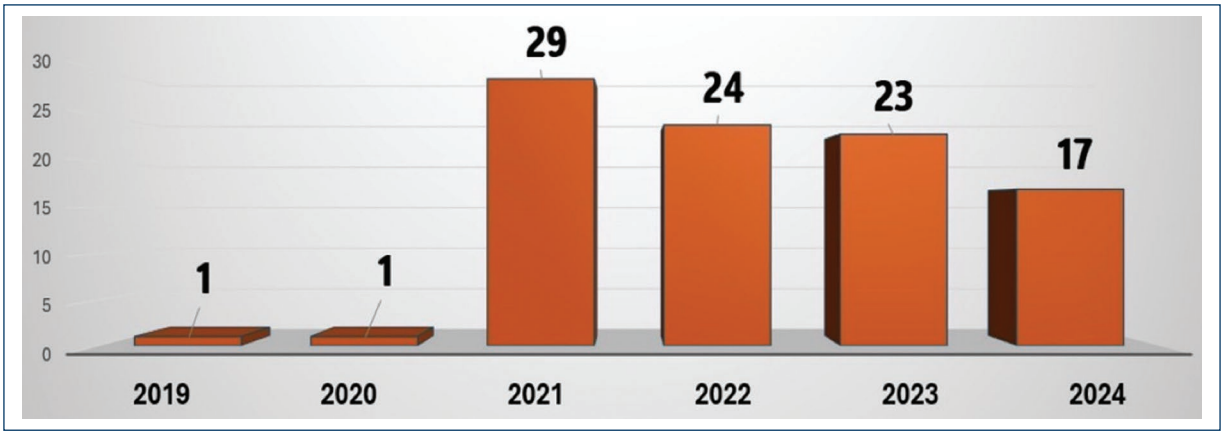

Figure 4. Diagnostic-therapeutic endovascular studies of the aorta.

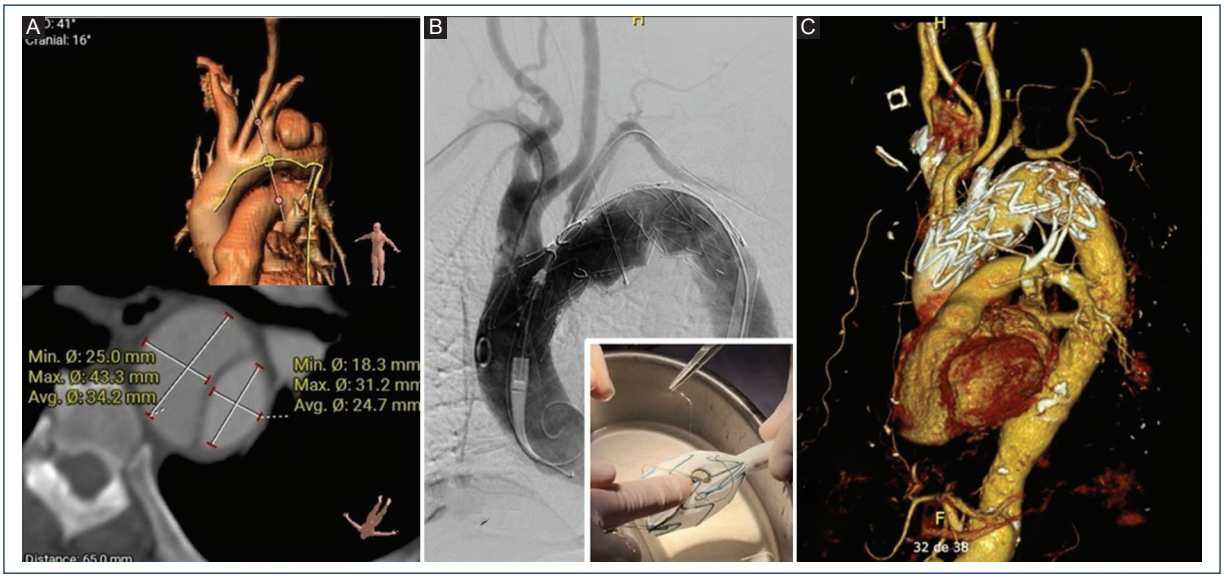

Figure 5. A: thoracic aortic dissection with neck vessel involvement to exclude the site of aortic rupture, the stent had to occlude the carotid artery. **B:** the stent is disassembled; the vessel orifices are marked with subsequent cannulation of the orifices and placement of a covered stent, creating an artificial branch called a "fenestra". **C:** control tomography at 6 months, exclusion of aortic dissection.

into the vein for 30 min, subsequent aspiration of the thrombus achieving total permeability of the vein, management on the floor and discharge after 24 h with oral anticoagulation.

Figure 4 shows the endovascular aortic procedures, 124 cases of aortic stenting, covered endovascular reconstruction of the aortic bifurcation (CERAB) technique, and kissing stent have been performed. Conditions, such as aneurysm and abdominal aorta, thoracic and thoraco-abdominal dissections resolved with placement of aortic stents with various versions of the technique, such as: scallop (window of the stent so as not to occlude main vessels), chimneys (placement of stents on one side of the stent to allow flow to the vessel), fenestration (holes in the stent in an artisanal way and subsequent cannulation to place a stent that allows flow to the vessel) for branches supra-aortic and mesenteric or renal vessels of the trunk. The placement of aortic stents is very large stent configured for vessels of larger diameters to redirect the flow over the normal lumen, avoiding the surgical option is a possibility, but increases the morbidity and mortality of patients due to the wide exposure that requires very extensive wounds with impingement of the vessel that causes ischemia

of the renal tissues intestinal and limb diseases at risk of loss. Most patients have comorbidities, as well as coronary artery disease, bleeding after surgery is greater, and the length of stay in therapy is greater. In Leriche-type aortoiliac disease (disease of the iliac aortic segment characterized by absence of pulse, gluteal pain and impotence), double stents or double balloon (kissing) or CERAB techniques have been performed, placement of a coated stent in the abdominal aorta and two stents for each iliac, Endovascular therapy in this territory has avoided severe ischemia of the mesenteric territory. Pelvic floor and both extremities, allowing to improve arterial flow to the diseased territory, most patients present pain when walking without palpable pulses, with treatment, the pain decreases and gait increases. We present a case of thoracic aortic dissection with involvement of vessels in the neck, to exclude the site of aortic rupture, the stent had to occlude the carotid artery and subclavian artery to avoid arm ischemia and cerebral ischemia. The stent is dismantled, the holes of the vessels are marked with subsequent channeling of the holes and placement of a coated stent creating an artificial branch called fenestra, the performance of the procedure requires hours of planning and advanced endovascular skills in a few places in the country, which is developed due to the lack of resources and technical skills (Fig. 5).

The results and benefits of endovascular therapy are very favorable in the population of the General Hospital of Mexico, support should continue to allow patients with vascular conditions to benefit from lower risk of morbidity and mortality and a prompt recovery to their activities, complying with the quality standards that require Mexico to show the world that it also has the capacity to provide a modern and effective alternative in medical care.

Funding

The authors declare that they have not received funding.

Conflicts of interest

The authors declare no conflicts of interest.

Ethical considerations

Protection of humans and animals. The authors declare that the procedures followed complied with the ethical standards of the responsible human experimentation committee and adhered to the World Medical Association and the Declaration of Helsinki. The procedures were approved by the institutional Ethics Committee.

Confidentiality, informed consent, and ethical approval. The authors have followed their institution's confidentiality protocols, obtained informed consent from patients, and received approval from the Ethics Committee. The Sex and Gender Equity in Research guidelines were followed according to the nature of the study.

Declaration on the use of artificial intelligence. The authors declare that no generative artificial intelligence was used in the writing of this manuscript.

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HISTORY ARTICLE

The audiology and speech therapy service pillar in the development of audiology and speech therapy in Mexico

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The Audiology and Phoniatrics service was founded in 1963 by Dr. Pedro Berruecos Téllez, being the first hospital service of this specialty in Mexico and Latin America, becoming a pioneer for the development of modern medical disciplines (Fig. 1). This specialty was born in Mexico in 1951, when Dr. Pedro Berruecos Téllez himself founded the Audiology and Phoniatric Center of Mexico. In 1983, the Medical Specialization in Audiology and Phoniatrics program was formally structured, at that time with 3 years. In 1995, the program obtained university recognition and was named "Communication, Audiology and Phoniatrics." Currently the specialty is called "Audiology, Otoneurology and Phoniatrics," covering a wide spectrum of hearing, voice, speech and balance disorders.

Since the foundation of the service, care work focused on the prevention, diagnosis, and treatment of voice, hearing, language, and balance disorders has been of great importance. In the teaching part, there is participation in the postgraduate university programs with the Faculty of Medicine of the *Universidad Nacional Autónoma de México*. In addition, the service has organized countless monographic courses, symposia and refresher courses in the area. In 1987, it obtained a great distinction when it was named "Latin American Regional Center for the Prevention of Hearing Problems," recognized by "Hearing International," an non-governmental organizations affiliated with the World Health Organization and made up of the International Society of Audiology and the International Federation of ENT Societies (IFOS).

Since 2000, various programs have been initiated and strengthened in the service to meet the needs of the general population. The first course for parents of deaf children was organized, which lasted a total of 100 h and served as a model to be extended to all the states of the Mexican Republic and to practically all the countries of the Latin American region. The "Hearing Health Weeks" were also held, which opened the doors to the entire population for the prevention and care of all types of hearing problems, which are an exemplary model of public health and the basis of undergraduate and postgraduate medical teaching programs and epidemiological and sociomedical research. He is a pioneer in the implementation of the "neonatal hearing screening program" (Fig. 2) and the "Cochlear Implants" program. With the first, a care model has been created that allows the timely identification of hearing problems in newborn patients, with or without risk factors; which was carried out even during the SARS COV-2 pandemic; with a coverage of more than 80% of newborns in our institution and care has been provided to patients born in other institutions The second, the "Cochlear Implant" program, opens the possibility of comprehensive prosthetic restoration of deafness, in children and adults. Since the beginning of the program in 2000, until 2023, more than 300 patients have been implanted, thus allowing them to fully integrate into the social and school environment.

In 2017, the President of the Republic inaugurated the new tower of rehabilitation, allergy, audiology, and phoniatrics; with an investment of 323 million pesos

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Figure 1. Former audiology and phoniatrics service.

Figure 2. Neonatal hearing screening program.

and 8,265 m^2 of construction, located in unit 601 of the Hospital. The Audiology service is located on the third floor of the tower, and for these new facilities, new equipment was provided for the specialized care of patients, which included: 4 sono-damped chambers with state-of-the-art audiometers, 1 auditory evoked potentials equipment, a videonystagmography equipment, 1 nasolaryngoscopy tower for voice evaluation and swallowing, 1 portable otoacoustic emission system, and a tympanometer. This equipment allows the complete instrumented assessment of patients with hearing problems, vertigo, dizziness, speech, voice, and swallowing; which together with the clinical knowledge of the staff of specialists; it allows not only to improve the quality of care of the service, but also to increase educational and research activities, ensuring a service of excellence, becoming one of the best services of audiology, otoneurology, and phoniatrics at a national level.

The specialty in audiology is one of the youngest medical specialties. In 1995, it was consolidated with the approval of the official university medical postgraduate program that is currently called "Audiology, Otoneurology, and Phoniatrics" which covers three major areas of study, diagnosis and treatment fundamental for the human being such as hearing, balance, voice and spoken language; although recently it has also been involved with the process of swallowing, since it shares the anatomical structures involved in phonation.

Table 1. Procedures performed in the audiology and phoniatrics service

Studies
Tonal audiometry
Tympanometry
Fitting of hearing aids
Brainstem auditory evoked potentials
Steady-state auditory evoked potentials
Laryngostroboscopy
Swallowing tests
Computerized voice examination
Cochlear implant calibration
Otoacoustic emissions (neonatal hearing screening)
Audiometry in the free field
Assessment for cochlear implant protocol
Cochlear implant activation
Videonystagmography
Otoneurological examination
Canalith replacement maneuvers
Speech therapy
Neuro-linguistic therapy
Voice therapy

In the area of audiology, we can say that hearing is the starting point of the main characteristic that distinguishes us from lower species, which is language. When there is total hearing loss, or there is a decrease in it, there are consequences of great relevance that can be personal, family, social, educational, and cultural. When an individual does not listen from birth, not only can they not learn to speak, but they also cannot access a second code of communication that is reading and writing, extremely important since it is the basis of cultural development. In the event that an adult who, having had a normal hearing function, stops hearing, will have serious limitations in communicating with the people around him, which will affect his personal, family, work, and emotional life. TO HEAR IS TO SPEAK. Hearing loss is one of the most common birth defects

in the world (2-3 out of every 1000 live births) and can reach a prevalence of up to 50% in adults over 70 years of age. The audiology service is one of the pioneers in the implementation of a program for the early detection of hearing problems in newborns and in the habilitation of profound deafness, mainly through the placement of a cochlear implant.

As for the voice, it is the letter of introduction of an individual, a unique, unrepeatable and irreplaceable characteristic that allows us to communicate with our peers and exchange ideas, thoughts, and needs. When it is affected by a disease that causes either timbre, tone, or intensity disorders and even the total absence of voice, it causes a mainly affective disorder in the patient who is limited in communicating. No less important is otoneurology, which is dedicated to comprehensively evaluating the sense of balance that allows us to roam at ease and perform all our daily activities. Dizziness, instability and other alterations in orientation in space and balance are reported by approximately 40% of patients who come to the clinic; this percentage will rise since there is a longer life expectancy and they are common disorders in older adult patients. Its importance lies not only in the diagnosis, but also in the timely treatment that in most cases includes physical rehabilitation for the reintegration of the patient to a normal life.

A fundamental part of the treatment of our patients is the area of rehabilitation or language habilitation, as the case may be. People who for some reason were born without hearing, once they have been fitted with an external or implantable hearing aid, require therapy sessions aimed at using the sounds that their hearing aids can pick up to develop language that allows them to communicate with the spoken word. However, patients are also treated who, due to some cause of disease or traumatic injury to the brain, lose the ability to speak (aphasia) and require rehabilitation therapy to restore this important function.

In the audiology and phoniatrics service of the *Hospital General de México Dr. Eduardo Liceaga*; the first of its kind in the Mexican Republic, 6 specialist doctors, 15 resident doctors, 8 speech therapists, 1 social worker, 3 nurses, and 3 administrative staff work together; committed to providing quality care and warmth to patients who request their care, which offer approximately 8,000 consultations a year (Table 1).

Funding

The authors declare that they have not received funding.

Conflicts of interest

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Ethical considerations

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HISTORY ARTICLE

Nursing history and care in the past 5 years

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The history of nursing at the *Hospital General de México Dr. Eduardo Liceaga* has been transformed along with its architecture; it has evolved significantly in its organization, in administrative management, and is taking firm steps in the area of research to contribute to the construction of a cutting-edge hospital. This evolution has not diminished their humanistic vision, but on the contrary, nurses have shown our closeness to the most vulnerable groups of our population. As part of this commitment, the then Deputy Director of Nursing, Mtra. Martha García Flores, in 2010 and until 2015, carried out, together with the Head of Nurses of the General Surgery Service on duty, Mtra. Inocencia Ovalle Narváez, the follow-up via telephone to surgical patients; at 15 days, 3 months, and finally 6 months after surgery, with the aim of monitoring the patient's perioperative experience, through the application of a survey to identify the degree of satisfaction and possible complications related to surgery or anesthesia. During this follow-up, the nurse provided the patient with more information about home care or dispelled some doubts. This simple follow-up strategy, such as the one used by telephone contact, allowed us to extend the national strategy for patient safety.

An important part of the historical memory lived in the past 5 years, we can highlight the installation of three Clinics: the Wounds, Stomas, and Diabetic Foot Clinic in 2014, where a group of specialist nurses began with the assessment, treatment, and follow-up of patients with pressure ulcers (today called skin lesions related to dependency), patients with diabetic foot, stomas, among other conditions. In the first half of 2024, they have provided specialized care to 772 hospitalized patients and 1,141 outpatients (Fig. 1).

The Intravascular Access Clinic, inaugurated in March 2014, maintains a unique work model based on nursing monitors who are responsible for the care, management, and control of intravascular accesses. This clinic is evolving by leaps and bounds in the use of technology for the installation of ultrasound-guided intravascular accesses, with the purpose of making the installation a precise and safe technique, reducing complications and reducing the time of insertion of catheters; in the first half of 2024, 4,007 intravascular accesses were installed, of which 270 Central Peripheral Insertion Catheters, 282 midlines and 10 peripheral catheters were installed through ultrasonography (Fig. 2).

Another icon is the clinic of excellence in thanatology who, through love and empathy, provide tools to people to face different situations, such as the death of a loved one or a pet, or facing a terminal illness or death. Her performance had a greater boom during the COVID-19 pandemic, accompanying and giving emotional support to family members who lost a loved one; In the first half of 2024, thanatological care was given to 1,182 patients and relatives in hospitalization and 384 patients were treated in the office. At present, these clinics have obtained recognition by the rest of the multidisciplinary team, so their consolidation in our organization is a concrete reality.

As part of the institutional commitment to be a spearhead in the training of human resources, the collaboration agreement and loan contract were consolidated through the *Universidad Nacional Autónoma de*

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Figure 1. Wound, stoma, and diabetic foot clinic nursing staff.

Figure 2. Nursing staff of the intravascular access clinic.

México (UNAM) foundation for the construction and administration of the "Graciela Arroyo de Cordero" Academic Unit, which was inaugurated on November 27, 2012. This Academic Unit has 6 classrooms and a lecture hall. At present the post-graduate courses endorsed by the UNAM are taught, undergraduate nurses from the faculty of nursing and obstetrics receive instruction, and monographic continuing education courses are taught for the nursing staff of our hospital.

In 2008, the "Nursing Consultancies" project began, which promotes health and develops the patient's ability to make assertive decisions regarding adherence to treatment (pharmacological and non-pharmacological), the adoption of healthy lifestyles, among others. Six personalized consultancies are currently consolidated: for pregnant women, people with kidney disease, family members and children with allergic rhinitis and asthma, people with hemato-oncological diseases, people with neurological diseases, and consulting in palliative care.

During 2010, the hospital verticalization project was developed; however, its materialization was in charge of Dr. Cesar Athié Gutiérrez, General Director, accompanied by Mtra. Ma. De los Ángeles Garrido González, Deputy Director of Nursing. It all began with the inauguration of the U-310 Surgical Tower in January 2016, with the visit of the President, Enrique Peña Nieto. The ribbon cutting was presided over by a series of strategies, such as the design and implementation of an "Opening Plan" which considered various factors, the logistics for the transfer, the staggered opening of the areas, the training for the handling of the new equipment, especially in the surgical areas, among others. In addition, several work teams were formed, distributing tasks and verifying the progress in their implementation, so that after their opening, there would be the least number of failures, which could have an impact on patient safety. The general surgery units 303, 305, 306, 307, and coloproctology were transferred to the surgical tower; the gastroenterology, intensive medical therapy, and central operating theatre services. This Master Plan of structural verticalization was followed by the opening in July 2017 of the cardiology, pneumology, and angiology towers and the physical medicine and rehabilitation, audiology-phoniatrics, and allergy and immunology tower, where, as in the surgical tower, all the logistics were developed to make a smooth transfer of the nursing staff to their new areas.

When the services were moved to the new towers, many areas were also vacated, and thanks to the unconditional support of the General Director, Dr. Cesar Athié Gutiérrez and the efforts of the Deputy Director of Nursing Mtra. Ma de los Ángeles Garrido González, in March 2018, was assigned to the nursing management group to occupy the facilities of the extinct audiology and phoniatrics outpatient clinic U-104. This new area received major maintenance, the installation of modems, new lighting, and the assignment of computer equipment, among others. The occupation of this space amalgamates the work of nursing managers and coexisting the sub-directorate of nursing and the departments of nursing care management and the department of education, training, and research in nursing.

In 2017, the "Management Skills" course was created for nursing personnel who performed the function of "manager" or "coordinator," to identify and develop future leaders in the management area. As of 2024, 33 nurses have participated in this training. Another innovative course implemented in that same year was the so-called "BLS and ACLS Introductory Course," which aims to prepare nursing staff to present the ACLS course certification endorsed by the American Heart

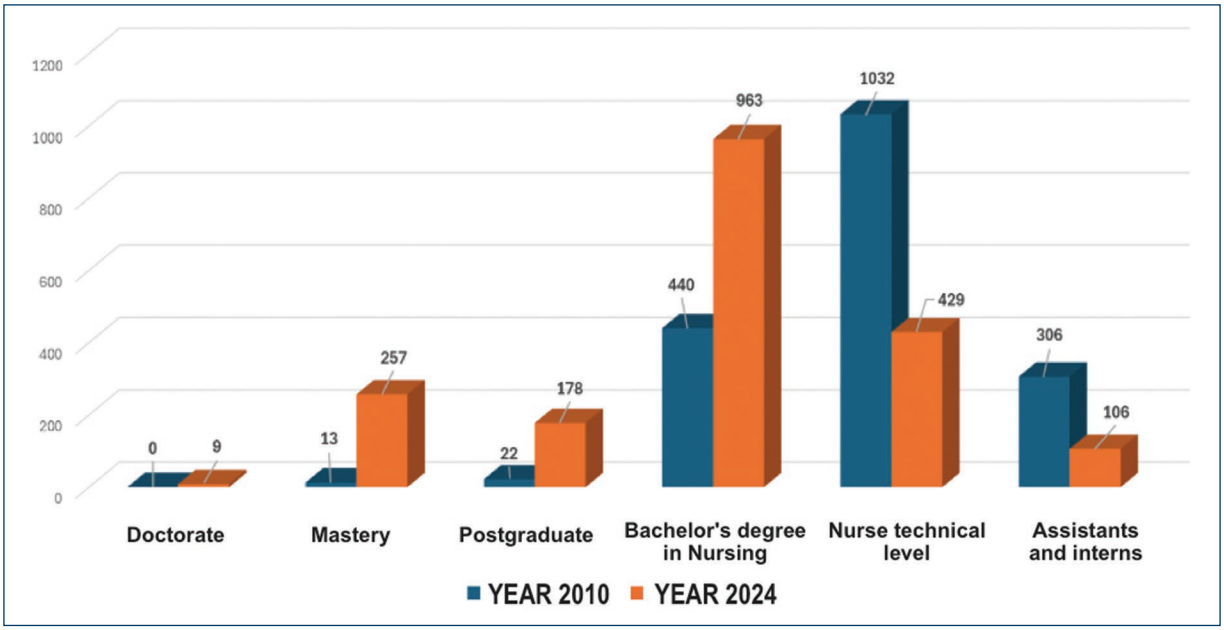

Figure 3. Comparison of the academic levels of the nursing staff, year 2010 and 2024.

Association. This strategy has allowed us to have a high percentage (98%) of efficiency to obtain the certification. A total of 523 nurses have been trained.

In 2019, as part of the hospital discharge, the creation of the "Nursing Discharge Plans" began, which reflect the specific and personalized care that the patient must take for their prompt recovery at home, according to the medical diagnosis. As of the end of this last quarter, 200 discharge plans for 18 medical specialties have been prepared and implemented. In February 2020, the first case of COVID-19 was reported in Mexico, a disease caused by the Severe Acute Respiratory Syndrome Coronavirus-2 virus. The nursing group began its preparation to be in a position to respond to this challenge, so it promoted the conversion of areas, which by August of that same year; the so-called "COVID Areas" were already in operation for the reception and care of infected patients in the infectology service. Medical surgical emergencies, the cardiology, pneumology and angiology tower, and the surgical tower. One of the biggest challenges was to adapt to the new health provisions of the World Health Organization for the management of patient isolation, pathological biological and infectious waste (RPBI), the preparation of corpses, the use of personal protective equipment, as well as the rapid hiring of temporary personnel to cover the spaces left by the nurses who retired derived from the presidential decree for the protection of health personnel vulnerable. At the end of September of this year, there are 515 temporary staff positions.

In October 2020, as an unprecedented event in the history of the *Hospital General de México Dr. Eduardo Liceaga*, the first call to participate in the selection process to occupy the position of deputy director of nursing was announced. This process was well received by the nursing guild and aroused the interest and participation of a large number of colleagues. From this process, the appointment was granted to Mtra. Ma Patricia Padilla Zarate, as of October 01, 2020, who to date holds the position. In this administration, important institutional projects have been implemented, an example of which is the improvement of the Equipment and Sterilization Centers (CEyE), in which the regulatory regulation, standardization, and implementation of protocols for the processing of biomedical material and equipment were carried out with an emphasis on patient safety.

The commitment of nurses to patients is a core part, so when an unfavorable finding is detected, work is done immediately, which is why the multimodal strategy to control the development of dependency-related skin lesions was launched in 2023, where all hierarchical levels of nursing participate with specific activities. Among the activities are: daily and shift risk assessment, placement of a visual alert, application of olive oil, placement of pressure releasers, mobilization of the patient at established times, as well as permanent

supervision of the process; the above under a regulatory framework and the design of a package of preventive measures according to the risk detected. So far, this strategy continues to be consolidated, which allows us to document the improvement process.

A strength in the organization is our human capital, as of September of this year we have 9 (0.46%) nurses with a doctorate level, 257 (13.23%) with master's degrees, 178 (9.16%) with post-graduate degrees, 963 (49.58%) nurses with a degree in nursing, 429 (22.09%) nurses at the technical level, and 106 (5.45%) auxiliary nurses and interns; giving a total of 1942 structural nurses. A comparison of academic levels reported in 2010 was made, observing a pleasantly significant growth of these (Fig. 3). Undoubtedly, this is due to the fact that, for more than two decades, there has been the initiative of the federal government through professionalization for the creation of positions according to the academic level, as well as institutional support for time scholarships, which has boosted the interest of nursing personnel in professionalizing their daily work. The nursing staff of the *Hospital General de México Dr. Eduardo Liceaga* continues and will continue to be a national and international reference for their high level of competence, ethical sense, and human quality, capable of evolving at the pace of the changes that the environment demands.

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Ethical considerations

Protection of humans and animals. The authors declare that the procedures followed complied with the ethical standards of the responsible human experimentation committee and adhered to the World Medical Association and the Declaration of Helsinki. The procedures were approved by the institutional Ethics Committee.

Confidentiality, informed consent, and ethical approval. The authors have followed their institution's confidentiality protocols, obtained informed consent from patients, and received approval from the Ethics Committee. The SAGER guidelines were followed according to the nature of the study.

Declaration on the use of artificial intelligence. The authors declare that no generative artificial intelligence was used in the writing of this manuscript.

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HISTORY ARTICLE

Genetics service of the *Hospital General de México Dr. Eduardo Liceaga*

*Ma. del Refugio Rivera-Vega, Alicia B. Cervantes-Peredo, and Verónica F. Morán-Barroso**

Genetics Service, Hospital General de México Dr. Eduardo Liceaga, Secretaría de Salud, Mexico City, Mexico

The Genetics Service of the *Hospital General de México Dr. Eduardo Liceaga* has as its antecedent of its formation the Cytogenetics Laboratory, founded by Dr. Héctor Márquez Monter, a distinguished pathologist who was a founding member of the Mexican Association of Human Genetics A.C. and president of the same in the period 1973-1975. The Cytogenetics Laboratory was part of the Pathology Service and occupied facilities of Unit 310 to later become the Genetics Service; from 1972 directed by Dr. Susana Helena Kofman Epstein. In November 1990, it was moved to Unit 311-A, where it had clinical and laboratory areas, where it remained until December 2017, when it was moved to the third floor of Tower 501, and since 2021, it has shared this space with the Directorate of Medical Coordination; and with the office of the Directorate of Support for Diagnosis and Treatment.

Dr. Susana Helena Kofman Epstein was the head of the Genetics Service from 1972 to 2008, Dr. Sergio Alberto Cuevas Covarrubias being appointed as head of the same in the period 2008-2017 and later Dr. Ricardo Juan García Cavazos in 2018, then Dr. Gloria Eugenia Queipo García served as head of it from 2018 to 2020 and Dr. Verónica Fabiola Morán Barroso, by competition, she was appointed as head of the Service as of October 2020 and as head of the Service since January 2021.

The evolution of the Genetics Service is a true reflection of the advances and changes as well as the challenges that have marked the development of Clinical Genetics since the 50s, when it was determined that DNA is the genetic material and its structure; among other aspects, the Genetics Service was one of the first in Mexico to have a molecular biology laboratory, since 1989; it also had the Genomic Medicine Laboratory from 2003 to 2020, and as an integral part of its activities with the Pediatric Obesity Clinic from 2011 to 2022; years in which they became independent from the Genetics Service.

In its present physical location, the Genetics Service has an outpatient area with four consulting rooms, an administrative area with four assigned people, cytogenetics, molecular biology, microarray analysis and Sanger-type DNA sequencing laboratories, as well as offices, two areas for resident physicians, five for attached physicians, two for researchers, and a common area for laboratory personnel. As well as a clinical archive and two warehouses.

Since its formation, the Genetics Service has had three axes of guiding activity, which are: providing genetics consultation, preparing undergraduate and post-graduate human resources, and conducting research with excellence. These axes are present in its objective and mission, and are carried out with the values of our Institution that include humanism, ethics and frontier knowledge to serve our patients as well as the interdisciplinary relationship with all the Medical specialties and Services of the *Hospital General de México Dr. Eduardo Liceaga*; all in relation to the care, management and treatment of patients as well as research into genetic conditions.

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In relation to medical assistance activities, 6 medical specialists work, four of them in the National System of Researchers, two of them at level 1, and two in level 2, in addition to resident doctors in training in the specialty of Medical Genetics. The Genetics Service carried out a restructuring of its activities due to the COVID-19 pandemic that began in 2020, for which the guidelines and indications given by the authorities were followed. Since 2023, it has had the support of a member of the nursing staff. The Medical Genetics consultation that is granted includes all age groups, from participation in pre-natal and pediatric diagnostic consultations, as well as conditions in adulthood, such as familial cancer syndromes. At present, and according to records, the most frequent request for care from patients includes neurofibromatosis type 1, intellectual disability, Down syndrome, various syndromes with congenital malformations, muscular dystrophies, cleft lip and palate, Marfan syndrome, familial cancer syndromes, among others. It participates in diagnostic clinics for genodermatology, high-risk pregnancy, craniofacial disorders, and rare diseases, among others.

In relation to the training of human resources, the specialty of Medical Genetics began in our hospital in 1974, was incorporated into the *Universidad Nacional Autónoma de México* in 1976, currently has a duration of 3 years, and to date more than 80 national and foreign medical specialists have been trained, there are four places for national residencies per year. It has the High Specialty in Genodermatology, and undergraduate, master's and doctoral students recognized by prestigious educational institutions in areas related to Clinical Genetics, such as biology and chemistry, have graduated.

In the area of laboratories, in relation to healthcare activities, these are carried out with two approaches: cytogenetics and molecular biology. In cytogenetics, karyotypes with Giemsa-Trypsin-Giemsa (GTG) bands are performed in both peripheral blood and bone marrow (hematological neoplasms). In molecular biology, Sanger sequencing is performed to search for pathogenic variants, microarray studies or molecular karyotyping, Multiplex Ligation-Dependent Probe Amplification to detect variants in the number of copies, among other analyses. There is also a next-generation sequencer dedicated exclusively to a researcher's projects. There are five cytogeneticists and eight professionals in the area of molecular biology. In the cytogenetics and molecular biology laboratories, frontier research activities are carried out and there are three researchers, one of the in the National System of Researchers level 1 and one level 2. More than 10 research protocols have been registered and participation is made in national and international congresses in the area of genetics, as well as multiple publications in scientific journals indexed with an impact factor.

The activities of the Genetics Service are in line with the vision of being a Vanguard Service in medical care and the generation of doctors specializing in Medical Genetics, with the training of Masters and Doctors in high-level sciences with a focus on the excellent care of our patients. Both in care, teaching and research, all carried out with the commitment to service to be part of the *Hospital General de México Dr. Eduardo Liceaga*.

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HISTORY ARTICLE

Historical review of the gynecology and obstetrics department of the *Hospital General de México Dr. Eduardo Liceaga* (2010-2024)

Jesús C. Briones-Garduño, Miguel Villa-Guerrero, Manuel Borges-Ibáñez, Araceli Sevilla-Cano, Annanda I. Márquez, Luis E. Reyes-Mendoza, Jesser M. Herrera-Salgado, and Carlos G. Briones-Vega*

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Introduction

From its beginning, the hospital integrated a maternity department (pavilion 30) reopened in 1934 that functioned until 1968, when the obstetrics and gynecology unit was built with a building of modern architecture, but with a fragile structure that collapsed on September 19, 1985. From 2010 to date, five doctors have been appointed as heads of service. It is currently located in building 112 and has medical care, teaching, and research. The philosophy of the service focuses on the birth being carried out in the best possible conditions, for which a rapid response team was implemented in critical obstetrics, prenatal consultation with a risk focus in the area of maternal fetal medicine, and the creation of critical medicine in obstetrics as a high specialty to solve all medical complications, surgical or obstetric. In gynecology it has also been possible to impact women's health, through the dysplasia clinic, laparoscopic surgery, fertility control and care for climacteric patients, as a university hospital we have the specialty in gynecology and obstetrics, maternal fetal medicine and high specialty in critical medicine in obstetrics, in research we have two members of the national system of level I researchers, with periodicals in journals, co-authorship in books and book chapters, and multiple research awards. The future needs to be strengthened; maternal-fetal medicine and critical care medicine, expand neonatal care coverage, and include care in urogynecology, reproductive biology, adolescence, and climacteric.

The *Hospital General de México Dr. Eduardo Liceaga* was planned as a hospital complex using the most modern techniques of that time by Dr. Eduardo Liceaga and Engineer Roberto Gayol, and inaugurated on February 5, 1905, by the president of the republic Porfirio Díaz. The hospital was made up of 32 pavilions, including gynecology, venereal-syphilitic diseases, tuberculosis, typhus, and the operating room that functioned with three operating rooms equipped with avant-garde instruments of that time, as well as the new methods of asepsis and anesthetics, mainly ether and chloroform. At the beginning of the twentieth century, medicine turned its attention to microbiology, antisepsis, epidemiology, vaccination, and anesthesia. By the second decade of this century, some medical specialties such as gynecology, ophthalmology, pediatrics, and mental illnesses were consolidated, considering that surgery was learned in a tutelary way alongside notable surgeons of the time.

Historical review

At the beginning of the third decade the total population was 16,552,722 habitants, two-thirds lived in rural areas, the economically active population was 31% and the schooling were 1.9 years of schooling and life expectancy of 36.9 years, the birth rate of 49.4 births/1000 inhabitants and the maternal mortality rate of 565 deaths/100,000

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registered live births caused mainly by due to infectious, hemorrhagic and hypertensive processes[1].

The original project of the hospital included a maternity department (pavilion 30) reopened in 1934, which functioned until 1968 when the obstetrics and gynecology unit was built with a building of modern architecture, but with a fragile structure that collapsed on September 19, 1985. The current service building was inaugurated in April 1998, and since then it already had specialist doctors, gynecology-obstetrics residents, and year's later maternal fetal medicine residents and critical care medicine residents in obstetrics[2]. From 2010 to date, five doctors have been appointed as Heads of Service: Dr. Antonio Guerrero Hernández, Dr. Jesús Carlos Briones Garduño (twice), Dr. Rafael Gerardo Buitrón García, Dr. Fausto Coronel Cruz, and Dr. Alejandro Posadas Nava.

As a support service, we recognize that birth is the most important moment in a human's life, as it is surrounded by dangers, from fertilization to the occurrence of the obstetric event, and the philosophy of the service focuses on ensuring that birth takes place under the best possible conditions. To this end, in 2010, the integration of a rapid response team in critical obstetrics was implemented, through the organized participation of a multidisciplinary medical group, called MATER (from maternity), as a hospital strategy aimed at reducing maternal and perinatal morbidity and mortality in all cases presented as obstetric, medical, and/or surgical emergencies[3].

We have a permanent nursing module that provides preconception counseling to advise and instruct women on how to recognize the signs and symptoms of complications during pregnancy and the postpartum period, emphasizing the breastfeeding program, and committing to providing highly specialized hospital obstetric assistance in managing complications, at the level of prenatal consultation with a risk-focused approach in the area of maternal-fetal medicine with systematic actions and procedures aimed at the prevention, diagnosis, and treatment of factors that may condition extreme maternal-perinatal morbidity, hosting the university course of this specialty from 2011, until the resolution of the obstetric event, recognizing that it can exhibit serious forms such as preeclampsia-eclampsia, or complicated forms such as acute obstetric hemorrhage, or maternal sepsis, making medical and surgical care have a decisive impact on the evolution of the binomial, emphasizing that women die in hospitals due to failures in the care of the medical obstetric emergency and/or surgical, so during the past 14 years, we have implemented two fundamental hospital strategies:

– Installation of the rapid response team with a multidisciplinary approach, comprising trained personnel: gynecologist–obstetrician, nurse, intensivist-internist, pediatrician, anesthesiologist, social worker, laboratory, and ultrasound, optimizing the care system with hospital resources, and ensuring care 24 h a day, 365 days a year.
– Creation of critical medicine in obstetrics as a high specialty, endorsed by the *Universidad Nacional Autónoma de México* (UNAM) since 2012, focusing on the patient in critical condition, under the concept that there is no pregnancy without risk, which is essential to remember that every pregnancy carries a risk of miscarriage, developing preeclampsia or intrauterine growth restriction, having a placental insertion disorder such as placental percreta, or the development of a choriocarcinoma, and that this can cause catastrophic hemorrhage with massive multi-organ impact, which involves correction of coagulation and fibrinolysis, and judicious use of pharmacological agents: Hemostatic agents, vasoactive substances, inotropes, and of course a refined process for controlling surgical hemostasis, hemodynamic control of severe preeclampsia, characterized by arterial hypertension, elevated peripheral vascular resistance, and low cardiac output, optimizing their multiorgan conditions in the obstetric-gynecological intensive care unit, which is equipped with updated technology such as non-invasive hemodynamic methods, high-resolution ultrasounds, and functional organ support equipment with volumetric ventilators and continuous dialysis machines, as well as a rotational thromboelastometer to expedite the diagnosis and treatment of coagulopathy, achieving recovery and preventing maternal death in the vast majority of cases[4-7].

Previously, it was believed that pregnant women were immunocompromised; however, it has been proven that they only have a greater susceptibility to intracellular pathogens, particularly viruses, bacteria, and parasites, derived from the physiological adaptations inherent to gestation. One of the main risk factors occurring in today's society is the delay in the fertile age period, understood as the woman's ability to ovulate and be fertile for the possibility of reproduction, which has become a problem due to the fact that this period has currently been deferred by developmental situations and lifestyle, as well as personal and cultural issues faced by women of reproductive age, exposing both the mother and the fetus to higher probabilities of complications and death, The other social risk factor is adolescent pregnancy; in our country, 20% of births that occur annually

are to women under the age of 19, young individuals with low education levels, lower academic and labor expectations, and low self-esteem, who tend to initiate their sexual life at an early age, use contraceptives less frequently, and upon becoming pregnant, increase the risk of experiencing an unfavorable obstetric event due to a lack of conditions and knowledge that facilitate better decision-making. In the field of gynecology, there has also been an impact on women's health through the dysplasia clinic, which operates alongside the oncology service, achieving early diagnoses of cervical-uterine cancer, implemented since the 1980s, and also offers a diploma course in colposcopy, which has wide national recognition. Recently, the reopening of laparoscopic surgery was also achieved, which had been implemented since the 1970s and ceased to function for multiple reasons. It has now been reestablished as a 6-month diploma program, which, like the colposcopy program, is supported by the UNAM. We also offer fertility control services and care for climacteric patients, with the advantage of working in coordination with internal medicine, endocrinology, hematology, and dermatology services that have supported the clinic for vulvar disorders for several decades[8-11].

In teaching, as a university hospital, we have an impressive track record in various specialties, such as gynecology and obstetrics, dating back to the sixties. During the last decades, it was possible to establish the headquarters of the specialty of maternal fetal medicine and the creation of the high specialty course in critical medicine in obstetrics, with great demand from national and foreign doctors. Especially Latin Americans, and as we pointed out, diplomas in colposcopy and laparoscopic surgery are taught, courses in emergencies and obstetric ultrasound are also taught for obstetricians and gynecologists, we participate in various academic forums with the National Academy of Medicine and Mexican Academy of Surgery, national colleges such as gynecology and obstetrics, internal medicine, critical medicine, anesthesiology, laparoscopy, and in nursing, we collaborate in the post-technical course in "perinatal nursing."

In research, we have two members of the national system of researchers at level I and in the health department at level B, with more than one hundred periodic publications in national and international journals, co-authorships in more than ten books, and multiple book chapters on maternal death, critical medicine, maternal-fetal medicine, renal failure, acute medicine, and critical medicine in obstetrics. In addition, we have received awards and recognitions such as the "Mario Shapiro" award on two occasions, in 2012 and 2014, granted by the Mexican College of Critical Medicine, the Aesclepio award from the Aesculap Academy Foundation in recognition of "excellence in surgical education," and the "Acad. Dr. Gonzalo Castañeda" award in 2023, awarded by the Mexican Academy of Surgery, as well as the first edition of the book on critical medicine in obstetrics published by the Faculty of Medicine of the UNAM, that was recognized with the award for "best medical work," 2019 edition granted by the *Academia Nacional de Medicina de México*[12-16].

The expectation for the near future in the obstetric-perinatal area: consists of strengthening maternal fetal medicine and critical care services, expanding neonatal care coverage for the care of neonates with complex heart disease and malformations susceptible to correction with intrauterine fetal surgery, in coordination with the genetics service to achieve prenatal diagnoses of aneuploidies, and for the area of gynecology, to grow with attention to urogynecology, reproductive biology, adolescence and climacteric, and in teaching and research to continue with the motivation and enthusiasm to optimize excellence in teaching with original research, both basic and clinical[17-19].

Conclusions

- Strengthen maternal-fetal medicine services, critical obstetrics medicine and expand neonatal care coverage.
- Implement urogynecology, reproductive biology, adolescence and climacteric care.
- Optimize excellence in teaching with original basic and clinical research.

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HISTORY ARTICLE

Allergy and immunology from Salazar Mallén's approach to the present day

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Historical background of the allergy service

In Mexico, in 1937, the director of the *Hospital General de México*, Dr. Ignacio Chávez, assigned the old experimental medicine room to the Allergy Department of the S.S.A. Several clinical and research laboratories were created, including the Allergy and Immunology of rheumatic fever laboratory in charge of Dr. Mario Salazar Mallén, with the impulse that was given to research, this laboratory had a purpose, the clinical study and research of the allergens of our environment[1].

In February 1938, the allergy service was inaugurated in pavilion 21, and Dr. Mario Salazar Manyn took charge of this Service, who was the founder and creator of its subsequent development. The creation of the allergy service gave impetus to this speciality and stimulated publications and research of great importance in relation to bronchial asthma, its multiple etiological factors, its clinical manifestations, its mechanism, and its therapeutics[2].

The formal teaching of allergology existed only at the level of the courses taught by the two national societies for general physicians. In 2025, the allergy service will celebrate its 87th anniversary, during which our service has occupied a leading position among other services nationwide[1,2].

The training of allergy specialists began, and Dr. Julio Cueva, Dr. Baltazar Rodríguez, Dr. José Luis Cortes, Dr. David Gordillo, Dr. Arturo Blakeller, who founded the allergy service in Guadalajara, Dr. Oscar de la Fuente in Monterrey, and Dr. Alfredo Ramírez Oviedo in Tijuana were trained under the command of Dr. Salazar Mallén.

The allergy service in charge of Dr. Mario Salazar Mallén, proposed among its first tasks the study of the allergological flora of the Mexican Republic, touching on this subject the works of Lyonnett and Salazar Mallen. Julio Cueva gave an excellent overview in his work called "Allergenic Flora of the Mexican Republic," but once these tasks were completed, the vehicle that would serve as a record and disseminate it was missing, for the benefit of others and to serve as an exponent of our National Scientific activity. As to this need, there was also the need to have an organ of publicity in our language. The Mexican Journal of Allergology was founded.

The practice of a little-known specialty 87 years ago led to problems, such as guaranteeing patients a professional level worthy of respect. The ignorance of the public and the lack of experience of doctors in matters of the specialty make charlatanism easy. It is necessary to have a solid preparation with good principles and excellent professional ethics.

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Thanks to the impulse of Dr. Ignacio Chávez, the *Hospital General de México Dr. Eduardo Liceaga* sent distinguished doctors to improve abroad Julio Cueva went to Minneapolis, Minnesota for his improvement in the study and identification of atmospheric pollens, who later researched and published the "Pollen Calendar of the Mexican Republic" that has served as a reference for all the study of palynology in Mexico. This was a beautiful way to cultivate empiricism in the profession. Dr. Julio Cueva succeeded Dr. Salazar Mallen as Head of Service.

Master Julio Cueva was, was the forger of the Allergy School in Mexico. Dr. Guillermo Zamacona, founder of the allergy service at the *Instituto Mexicano del Seguro Social* (IMSS) National Medical Center, José Guadalupe Huerta and Nelly Ramírez founded the allergy service at the INP, Dr. Jorge Guillen Toledo and Manuel Romero Herrera founded the allergy service at the 20 de November Medical Center, Dr. Luis Villanueva at the Adolfo López Mateo's Hospital, Dr. José Castillo at the La Raza Medical Center, in the rest of the republic the services were founded by graduates of the Allergy and Immunology Service of the *Hospital General de México Dr. Eduardo Liceaga* as it was in Guadalajara, Tampico, Durango, Sinaloa and Tijuana. Not least, a world-famous character trained in the allergy service of the General Hospital, Dr. Ernesto Guevara Serna.

The graduates currently continue with this mystique, now we can speak in Ecuador Juan Fernández de Cordova Aguirre, in Salvador Cesar Urquiza Ramírez, in the Dominican Republic Margaret Moya Almonte and in Bolivia Karla Vallejo's Pereira.

Figure 1. Head of the Allergy Department and President of the Medical Society of the *Hospital General de México Dr. Eduardo Liceaga* (right).

Members of work teams, staff and organization of the service

The medical staff working in the Service is Dr. Andrea Aida Velasco Medina, who coordinates teaching and research, Dr. Flor de Guadalupe Peñaloza, Martha Valencia, Manuel Sánchez, Dr. Antonio Albarrán, Dr. Itzel Yoselyn Sánchez, Leobardo López Medina, as head of the Dr. Guillermo Velázquez Sámano Service. Second-year resident doctors Verónica Apolicán Juárez and Elena Saavedra; first-year resident doctors Citlalli Anahi Ramírez Casillas, Diana Laura Alvarado Carrillo, and Beatriz Altagracia Contreras; interns Evelyn Michell Ortega Arizcorreta and Brenda Karime Romero Espinosa; in the laboratory are biologist Alejandro Rosas Alvarado and chemist Ma. de Lourdes Mendoza Gertrudis; in nursing, Merit Moreno Herrera, María de Lourdes Flores Cando, Paula Santana Bastida, Ruth Torrescano, Teodora, and Eunice; and as secretary, Patricia Hernández Roldan[3,4].

Lines of research

Allergic diseases mediated by immunoglobulin E (IgE) or immediate hypersensitivity are one of the most frequent chronic recurrent pathologies worldwide. It is currently estimated by the World Health Organization and the Global Initiative for Asthma that asthma affects 300 million human beings in the world, 20% of the world's population suffers from an IgE-mediated disease such as asthma, rhinitis, conjunctivitis, rhinoconjunctivitis, atopic eczema, urticaria, drug allergy. Moreover, it is considered that more than 50% of asthma in adults and about 80% of childhood asthma is of allergic origin, affecting 5-18% of the child population. Climate change, pollutants, overcrowding, and eating habits participate in the etiopathogenesis of these diseases. Concerned about these conditions, we have taken on the task of participating with the following lines of research: risk factors and treatment of bronchial asthma

Figure 2. Facade of the former Allergy and Clinical Immunology Service, in 1974.

Figure 3. Current head of service, located at the rear, Dr. Guillermo Velázquez Samano and service staff, 2025.

and allergic rhinitis, epidemiology and immunology of oral allergy syndrome, treatment of chronic urticaria, severe atopic dermatitis, allergy to drugs, use of monoclonal in allergic diseases, and description of changes in the microbiota of allergic patients

Relevant contributions to the discipline

Since its foundation, the allergy service has been characterized by the comprehensive training of professionals in Allergy and Clinical Immunology, highlighting care, teaching, and research. Once this has been completed, the contribution of the results to the rest of the scientific community. Books such as Allergy in Theory and Practice, by Mario Salazar Mallén and Julio Cueva have been published. Recently, Dr. Guillermo Velázquez Sámano has participated in the Guide for admission to residency exams in the Area of Immunology, as authored. A Manual of Perioperative Allergy and others written in recognized journals have been published nationally and internationally, including the *Revista de Alergia México*, *Revista Médica del Hospital General de México*, Allergy and Rhinology, among others.

Future scenario of the service

Analyzing the historical background and observing the changes and transformation, and evolution of the current field of clinical immunology, it is evident that we cannot lull ourselves or live from the past; we are at the moment, and this moment of institutional change, we have to be prepared and act today. History is being written; therefore, innovation should not stop. The project of the service is to train graduates of the specialty with a broad capacity to solve allergy problems, provide well-being, economic savings, offer a first-class service in care with personal responsibility, and train the maximum of our graduates with professional ethics and respect for the individual values of users.

Within this broad complement, the staff, and specifically the doctor, has to be integral in the management of users, complementing their practice with research and teaching[4].

The Allergy and Clinical Immunology service for the future will continue to be the capable staffer and to be a center of excellence, and to remain at the forefront and in the first place as an example for national and international level. That is why we must maintain, not the good, but the best in scientific, clinical, and social responsibility.

And how to achieve this by always choosing the best man or woman as a leader who brings together this ability to unite, to preserve values, not seeking personal well-being, but for the common good. I am fully convinced that our only possible surrender in the scientific field is to produce. The work is long and calls for perseverance in purpose and unity in thought. The secret of success lies in comprehensive cooperation.

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Conflicts of interest

The authors declare no conflicts of interest.

Ethical considerations

Protection of humans and animals. The authors declare that no experiments involving humans or animals were conducted for this research.

Confidentiality, informed consent, and ethical approval. The study does not involve patient personal data nor requires ethical approval. The SAGER guidelines do not apply.

Declaration on the use of artificial intelligence. The authors declare that no generative artificial intelligence was used in the writing of this manuscript.

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HISTORY ARTICLE

The evolution of the physical medicine and rehabilitation service in the last decade

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In the last decade, the Physical Medicine and Rehabilitation Unit of the *Hospital General de México Dr. Eduardo Liceaga* has evolved in response to the changing needs of society and advances in the field of Rehabilitation Medicine, hence the demand for care has grown exponentially, driven both by the desires for greater well-being and better quality of life of today's society, and by greater integration and collaboration with other medical specialties at different levels of care. The Physical Medicine and Rehabilitation Service faces new challenges, such as:

- The inversion of the population pyramid, due to the increase in life expectancy, as the population ages, there is a higher level of disability, which is reflected in a greater need for care, higher costs of medical and social care, and the impact of chronic-degenerative diseases.
- Surviving serious illness and trauma leaves an increasing number of people with complex problems and functional deficits. Many of these people are young at the time of their accident and/or injury and will survive several more decades. Examples are numerous: cerebrovascular diseases, traumatic brain damage, polytrauma, and childhood cancer.
- Treating the consequences of diseases and traumas, such as spasticity resulting from brain or spinal cord damage, means that not only does it improve the lives of patients, but there is also a health budget benefit by reducing the costs of treating these complications. This will have a direct effect on health services, working life, and pensions. In particular, problems such as immobility, pain, nutrition, incontinence, communication disorders, mood and behavioral disturbance become more important if they are added to systemic diseases and complications of diseases that predispose to disability.

Rehabilitation medical care in the Physical Medicine and Rehabilitation service is patient-centered, evidence-based, and, through the use of the latest research technologies, of high quality, innovative, and efficient; based on the Official Mexican STANDARD NOM-015-SSA-2023, for comprehensive medical care for people with disabilities. Moreover, complying with the definition of Physical Medicine and Rehabilitation, which states: a medical specialty dedicated to promoting physical and cognitive functioning, activities (behavior), participation (quality of life), and modifying personal and environmental factors; accordingly, it is responsible for the prevention, diagnosis, and rehabilitation treatments of people of all ages with disabling diseases and comorbidities.

Rehabilitation interventions range from intensive care units to outpatients of all ages with acute and chronic conditions that lead to functional deficits.

The Physical Medicine and Rehabilitation Service is located in Tower 601, it offers the following services: specialized outpatient consultation, electrodiagnosis, cardiopulmonary rehabilitation, physical therapy, occupational therapy, support services; nursing, social work and psychology, hours of operation from 7:00 a.m. to

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Table 1. Productivity of the physical medicine and rehabilitation service

Variables	January-December 2023	January-June 2024
Patients	11,385	7,732
Sessions	59,613	39,565
Consultations 1ª time Subsequent	 6,985 9,978	 4,390 6,634
Interconsultations 1ª time Subsequent	 800 400	 427 267
Evoked potentials	922	682
Electromyography	1,962	1,566
Stress tests	385	337
Cardiac monitoring	118	19
Cardiac training	802	710
Breathing exercises	1,342	216
Application of botulinum toxin	121	59
Vials	219	122
Subcutaneous therapeutic substance injection	473	360

8:00 p.m. Monday to Friday for external and hospitalized users, from 8:00 a.m. to 8:00 p.m. Saturdays, Sundays and holidays for hospitalized patients. Distribution of the service: ground floor: clinical archive, social work module, hydrotherapy area equipped with swirl tubs for upper and lower limbs, therapeutic tank, water treadmill. First floor: occupational therapy areas equipped with different educational materials, eight medical offices, administrative areas, and somatometry. Second floor: electrotherapy areas with 25 equipped cubicles, facial paralysis cubicle, cervical and lumbar traction cubicle; gym equipped with parallel bars, Swedish bars, treadmill, isokinesia equipment, incline tables, weight support. Four electrodiagnostic offices with two electromyographs. Fourth floor: cardiac and pulmonary rehabilitation area, two consulting rooms, gym equipped with a treadmill for stress test, hand bike, stationary bicycles, and isokinetic equipment.

For the management of patients, the Physical Medicine and Rehabilitation unit is made up of an interdisciplinary team: a head of service, doctors specializing in rehabilitation medicine with current certifications: four in the morning shift, three in the afternoon shift, one in 12 h on Saturdays, Sundays, and holidays. Eighteen physical therapists, four occupational therapists, nursing, social work, and psychology support services, and administrative staff. In addition to medical consultation, there are different modalities of therapeutic treatment (Table 1).

Education: residency trainer in rehabilitation medicine, with a duration of 4 years, five residents enter per year; it receives internal and external rotations from different medical disciplines.

Lines of research: musculoskeletal rehabilitation, neurology rehabilitation, oncological rehabilitation, geriatric rehabilitation, publications, book chapters, and in impact journals.

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Ethical considerations

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HISTORY ARTICLE

Neurology and neurosurgery services past, present, and future

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Historical overview

The neurosurgery and neurology service of the *Hospital General de México Dr. Eduardo Liceaga,* has a rich history that reflects its commitment to academic excellence, medical innovation, and comprehensive care for patients with neurological diseases. Founded as a section within the department of surgery in the first third of the 20th century, it evolved into an independent service due to the growing interest in neurological pathologies and the need for specialized training in this area.

The origins (1937)

In 1937, the neurosurgery service of the *Hospital General de México Dr. Eduardo Liceaga* took its first steps in Pavilion 7, under the direction of the visionary Dr. Clemente Robles Castillo. Conditions were challenging: deteriorating facilities and a notable lack of adequate equipment. Despite this, Dr. Robles courageously took on the task of shaping a medical specialty that was just beginning to emerge in the country.

Surrounded by exceptional collaborators such as Dr. Teodoro Guzmán Páez, Dr. Ramón del Cueto, Dr. Alfredo Lejarza, and Manuel Carbajal, Dr. Clemente Robles set out to transform limitations into opportunities. I started by adapting a small laboratory mainly for the analysis of cerebrospinal liquor under the coordination of Dr. Zulema Quevedo. With the incorporation of Dr. Mariano Vázquez, a pioneer in cerebral angiography, and Dr. Teodoro Flores Covarrubias, creator of the hospital's first electroencephalograph, funded by Dr. Robles himself, the team consolidated a legacy of technical and scientific innovation.

Dr. Roberto Gamboa Acosta, with training in neurology, and Dr. Leopoldo Salazar Viniegra, with training in neurology and psychiatry, played a crucial role in strengthening the outpatient clinic and selecting patients suitable for surgical treatments. This collective effort culminated in an unprecedented achievement: the first successful brain tumor surgery in Mexico, an event that marked the beginning of a new era in national medicine.

Medical personnel was integrated who in posterity became figures of Medicine in Mexico; Dr. Isaac Costero in Pathology, Dr. Magín Puig Solanes in Ophthalmology, Dr. Nardo Dorbecker Casasús and Dr. Carlos Coqui in Radiology, and Dr. Ramón del Cueto Decuir in Neurosurgery. His work transformed the Service into the First School of Neurosurgery in the country (Fig.1).

The cases treated with favorable results began to be published, such as: brain tumors and cysticercosis; a case of suprasellar tumor of pituitary origin was reported; the clinical picture of IV ventricle cysticercosis was described; the case of an amoebic abscess; tuberculosis of the brain; surgical possibilities of epilepsy; colloid cyst of the third ventricle, communication of a surgically cured case; Considerations of 100 tumor cases operated on, prefrontal lobotomy in intractable pain. Treatment of arteriovenous malformations due to embolization with muscle and the use of the Pudenz tube in the treatment of cerebral cysticercosis.

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The consolidation (1958)

The urgent need arose to transform the service of Pavilion 7 into a neurology and neurosurgery unit in which the subspecialties that had been developed would function integrally and that would strengthen care, teaching, and research. Mr. Clemente Robles planned and elaborated a project with the close collaboration of his disciple, Dr. Ramón del Cueto Decuir, that culminated in the inauguration of the new Unit on November 18, 1958, by the President of the Republic, Mr. Adolfo Ruíz Cortines, and the Secretary of Health and Assistance, Dr. Ignacio Morones Prieto (Fig. 2).

The new neurology and neurosurgery unit was significantly expanded with the addition of 72 beds, three operating rooms, and improved areas for electroencephalography, neuropathology, and neuroradiology. He brought together a group of young neurologists and neurosurgeons, who came to innovate the service, highlighting in neurology Dr. Luis Sáenz Arroyo through neuropathology, Doctors: Luis Lombardo Rivera, Juan Carrasco Zanini (neurolinguist), and Manuel Irigoyen, practicing neurology of excellence. Dr. Jorge Coverna Barnardelli, neuro-otology, Dr. Manuel Sáenz de Viteri, neuro-ophthalmology, Dr. Amal Hachache de Vizcaíno, expert in neuromuscular diseases, Dr. Jaime Dorfsman Figueroa, neuroradiology, Dr. José Vázquez del Mercado, electroencephalography, and the first neurologists integrated into the neurology service, such as Dr. José Sergio Zenteno Vacheron, Dr. Alejandro Barcena, Dr. Aurora de la Vega, Dr. Ángel Centeno Zepeda, and Dr. Ricardo Ramos Ramírez, who later was head of service of the neurology service.

The service was strengthened with the important contributions of Dr. Juan Olvera Rábiela in neuropathology, in neurosurgery, Dr. Ramón del Cueto Decuir initiated stereotactic neurosurgery of abnormal movements, Dr. Patricio Beltrán Goñi introduced the use of the microscope and promoted spine surgery, and Dr. Edmundo Reyes Armijo was the first neurosurgeon trained entirely in this service.

In 1967, the Association of Neurological Sciences, A.C., was founded, and in 1968, the first issue of its dissemination organ, *El Boletín de Ciencias Neurológicas*, was published.

The contribution of Dr. Clemente Robles Castillo in 1979 should be highlighted, in which he introduced for the 1st time the use of Praziquantel in the treatment of cerebral cysticercosis with success in humans. He followed his research protocol with the collaboration of Dr. Noé Vargas Tentori, which allowed them to verify the usefulness of the treatment with its publication in

Figure 1. The origins (1937).

Figure 2. Inauguration of the neurology and neurosurgery unit in 1958.

1987, which constituted a contribution of Mexican medicine to medicine in the World.

Dr. Clemente Robles Catillo was succeeded as head of the neurology and neurosurgery unit by Dr. Ramón del Cueto Decuir in 1973, Dr. Edmundo Reyes Armijo in 1975, Dr. Patricio Beltrán Goñi in 1978, Dr. Carlos Prado García in 1986, Dr. Francisco Velasco Campos in 1997, Dr. José de Jesús Gutiérrez Cabrera in 2008, and Dr. Noé Vargas Tentori as of June 29, 2010. Dr. Minerva López Ruiz from February 2017 to March 2018. In March 2018, Dr. José Damián Carrillo Ruiz was appointed as head of service until April 2019, succeeded by Dr. Aldo Francisco Hernández Valencia, until August 2021 (Fig. 3), remaining only as head of the neurosurgery service, until June 2024, during which time he was succeeded by Dr. Alejandro Méndez Viveros, current head of the neurosurgery service. Pavilion 403 C.

In this period, in 1981, the neurology residency program was initiated, one of the first in Mexico, turning the hospital into a training center for specialists who

Figure 3. Neurosurgery service (2023).

today occupy prominent positions in national and international institutions. Dr. Guillermo Albert Meza is the first neurology resident to graduate from this institution.

The neurology and neurosurgery service has distinguished itself in medical and surgical research, being the object of numerous national and international recognitions. A group of its members are researchers of the National System of Researchers.

Earthquake and uncertainty (1985)

Reflections on organizational resilience

«There are men who fight all their lives, those are the essential ones.»
– Bertolt Brecht

The *Hospital General de México*, founded in 1905, has witnessed pivotal events in Mexico's history. One of the most painful and significant moments was the earthquake of 1985, which left a deep mark on its physical structures and on the collective memory of all those who were part of its community. The destruction of the most iconic buildings, such as the Obstetrics-Gynecology Unit and the Medical Residency building, resulted in the loss of 295 lives and a significant disruption of medical care.

Despite the material damage, the spirit of resistance of the hospital staff, led by doctors Noé Vargas Tentori and Clemente Robles, allowed the reopening of the *Hospital General de México Dr. Eduardo Liceaga* demonstrating not only institutional resilience but also the ability to transform adversity into an opportunity to improve.

COVID-19 pandemic: 2020-2021

Adaptation and priorities in times of crisis

The COVID-19 pandemic posed an unprecedented challenge to health-care systems around the world, and *Hospital General de México Dr. Eduardo Liceaga* was no exception. During this period, spaces and resources were reconfigured to prioritize critical areas, allowing for more efficient care of COVID-19 patients, while maintaining care for uninfected patients, albeit with limitations.

This approach allowed the neurosurgery and neurology service to be reorganized to focus on emergencies, cases of greater urgency, and neurological complications from COVID-19, ensuring that medical staff were strategically distributed to meet the immediate needs of patients. The pandemic underscored the importance of organizational flexibility and the ability to adapt quickly to unexpected situations.

The neurology and neurosurgery unit: the separation (2022)

Neurology service

As far as the neurology service is concerned, distinguished neurologists have had the honor of being heads of service, including: Dr. Ricardo Ramos Ramírez, Dr. Joel Orozco Paredes, Dr. Minerva López Ruiz, who was also interim head of unit 403 neurology and neurosurgery service and began the strategic plan in 2017 for the administrative separation of the neurology and neurosurgery services, subsequently, Dr. Ana Luisa Velasco Monroy serves as head of the neurology service office in the year 2019-2020. During the management of the Director General, Dr. Guadalupe Mercedes Lucía Guerrero Avendaño, the administrative separation of both services was consolidated, leaving the Neurology Service autonomous and in charge of the Medical Directorate, with the assignment in the Head of Dr. Claudia Elisa Alfaro Tapia, the first head of the independent neurology service of neurosurgery. Unit 403 B, in addition, from this moment on,

neurological intensive care therapy is part of the neurology service, under the coordination of Dr. Javier Ruiz Pérez.

The decision to divide the Neurology and Neurosurgery Unit marked a milestone on the path to specialization within the health area. This strategic change allowed both disciplines to develop independently, enhancing the quality of services and adapting to the specific needs of each patient. The separation not only optimized resources but also fostered innovation and medical excellence, laying the foundation for a more efficient and patient-oriented future.

News: leadership and commitment

Today, the neurology service of the *Hospital General de México Dr. Eduardo Liceaga,* is a model of excellence in medical care, teaching, and research (Fig. 4). It has highly specialized clinics such as the demyelinating diseases clinic with comprehensive management of multiple sclerosis and other related pathologies; the Nerve and Muscle Clinic, leading the diagnosis and treatment of neuromuscular disorders; and the Headache Clinic, with cutting-edge approaches to the treatment of migraines and other painful disorders.

In addition, specialized procedures, such as plasmapheresis and the use of biological therapies, have been expanded to benefit patients with severe neurological autoimmune diseases. On March 1, 2024, the high specialty course in medicine in autoimmune and demyelinating inflammatory diseases of the central nervous system is inaugurated, with the endorsement of the *Universidad Nacional Autónoma de México* (UNAM), under the ownership of Dr. Gil Playas Pérez, receiving two neurologists in the first generation 2024-2025.

Currently, the neurology service, unit 403-B, has a total of 11 neurologists: six of them in the morning shift: Dr. Gil Playas Pérez; head of the High Specialty course in demyelinating diseases, adjunct professor of the postgraduate course at UNAM, and coordinator of the Nerve and Muscle and Demyelinating Diseases Clinics, Dr. Minerva López Ruiz, former president of the Mexican Academy of Neurology, Research Coordinator of the Service, specialist in Parkinson's and abnormal movements and national expert in Tuberculosis of the Central Nervous System. Dr. Rosalía Vázquez Alfaro, coordinator of the neurology outpatient clinic and in charge of the Headache Clinic, Drs. Karla Salinas Barboza and Dr. Lurdes Cassandra Navarro Roa, specialists in Parkinson's and Abnormal Movements, as well as Dr. Claudia Elisa Alfaro Tapia, a specialist in neurophysiology and current head of service and professor of the postgraduate course. In the afternoon shift, Dr. Julieta Givaudan Jiménez, Dr. Milton René Morán Morales, a specialist in clinical neurophysiology and sleep medicine, and Dr. Valois Martínez Díaz are attached.

Since 2024, we have been fortunate to have doctors assigned to the accumulated day, which is covered by Dr. Martha Guadalupe García Toribio, a specialist in epilepsy and neurophysiology, and Dr. Juan Esteban Montes Ramírez, a specialist in cerebral vascular disease, adjunct professor of the postgraduate course, and coordinator of the stroke code at the institutional level.

Recognition and vision for the future

The service maintains a constant commitment to the training of excellent human resources and cutting-edge research. In recent years, it has strengthened its collaboration with other national and international institutions, integrating new treatments and technologies that improve the quality of life of patients. We have been recognized by the World Federation of Neurology as a training center for medical specialists of excellence since 2015 (Fig. 5).

The service's vision for the future includes the expansion of its infrastructure, the adoption of innovative therapies, and the consolidation as a leading center in neurology in Latin America. The neurology service of the *Hospital General de México Dr. Eduardo Liceaga* stands as a pillar of neurological care in the country, remaining faithful to its mission of providing quality medical care, promoting academic training, and promoting scientific research to face the challenges of modern neurology.

The multimodal care of the neurosurgery service

Growth and diversification

The neurosurgery service of the *Hospital General de México*, *Dr. Eduardo Liceaga*, has grown and diversified its offer through specialized modules that include:

*Functional Neurosurgery wa*s organized in 1972 under the coordination of Dr. Francisco Velasco Campos, a leader in the treatment of diseases such as Parkinson's, epilepsy, and psychiatric disorders, using advanced technologies such as stereotaxy. Attached to this module are neurosurgeons with high specialty

Figure 4. Neurology service (2024).

Figure 5. Neurology service (2015). In front, from left to right, Dr. Claudia Elisa Alfaro Tapia, Dr. Minerva López Ruiz, and Dr. José Sergio Zenteno Vacheron.

in the area: Dr. Fiacro Jiménez Ponce, dedicated to psychosurgery and abnormal movements; Dr. Luis García Muñoz, dedicated to radiosurgery; Dr. Gustavo Aguado Carrillo, dedicated to epilepsy surgery; Dr. José Luis Navarro Olvera, dedicated to neuro-oncology; Dr. Jesús Quetzalcóatl Beltrán Mendoza, dedicated to neuro-oncology, and Dr. Julián Eduardo Soto Abraham, current coordinator of the module and professor of the high specialty course in functional neurosurgery.

Vascular and Endovascular Neurosurgery began in 2015, by Dr. Aldo Hernández Valencia, with the collaboration of Dr. Leoncio Alberto Tovar Romero.

Spine Surgery began in 2019 under the coordination of Dr. Alejandro Méndez Viveros, adjunct professor of the high specialty course of spine surgery and current head of the neurosurgery service. Doctors Julián Eduardo Soto Abraham and Gustavo Aguado Carrillo collaborate in this module.

Endosurgery and Skull Base, this module begins with the arrival of neurosurgeons with a high specialty in the area. It was started in 2020 by Dr. Paula Alejandra Benítez Gasca, the first neurosurgeon of this hospital and currently coordinator of the module. Doctors José de Jesús Martínez Manrique and Leoncio Alberto Tovar Romero are integrated into this team.

Emergency neurosurgery. It emerged in 2019, under the coordination of Dr. Arturo Larrazolo López in the morning shift and Dr. Luis Felipe Gordillo in the afternoon shift.

This modular structure allows for more comprehensive and personalized care for patients, as well as improving efficiency and quality of service. In a context where specialties are constantly diversifying, democratizing all modules with the same hierarchy in the organization of the service allows for a more balanced and collaborative approach, without rigid hierarchies that can hinder knowledge sharing and multidisciplinary work. This horizontal organisation encourages innovation and improves communication between the different work teams, which results in more complete and efficient care.

On the way to the centenary

The neuroscience tower of the Hospital General de México

In 2037, the former neurology and neurosurgery unit of the *Hospital General de México Dr. Eduardo Liceaga* will celebrate 100 years of history, marking a century of dedication to neurological health care in the country. As part of this commemoration, a project

has been announced that promises to transform the panorama of neurosciences: the Neuroscience Tower, a unique space where the specialties of pain clinic, neurosurgery, neurology, and mental health will converge.

This ambitious project represents the natural evolution of a legacy built over decades. Since its first steps, the neurosurgery service has been distinguished by excellence, innovation, and commitment to patients. Now, the Neuroscience Tower will seek to consolidate that history into a modern infrastructure that will allow it to provide more comprehensive, efficient, and personalized care.

A space for the future of neuroscience

The neuroscience tower will not be just a building; It will be a meeting point for doctors, researchers, students, and patients. Its design is designed to integrate cutting-edge technology, from operating rooms equipped with advanced visualization systems to laboratories specialized in the study of neurological diseases. In addition, special emphasis has been placed on creating spaces that favor collaboration between specialists, ensuring a multidisciplinary approach that directly benefits patients.

Benefits that will transform health care

- Comprehensive care: the proximity between disciplines will allow a more coordinated management of complex cases, improving clinical results.
- Expanded capacity: with larger, more modern facilities, it will be possible to serve more people, reducing wait times and expanding access.
- Constant innovation: the tower will house advanced technology for diagnostics and treatments, positioning itself as a national and international benchmark.
- Mental health care: by including this specialty, the importance of addressing neurological and mental health as an interconnected whole is recognized.

A tribute to the past and a promise for the future

The neurology and neurosurgery service of the *Hospital General de México*, *Dr. Eduardo Liceaga*, has witnessed great advances over the years, but also enormous challenges that have been overcome thanks to the dedication of its staff. The Neuroscience Tower is a tribute to that effort and a commitment to continue growing.

Recognitions

The development of neurology and neurosurgery at the *Hospital General de México Dr. Eduardo Liceaga* has been the result of the collective effort of hundreds of people who, over the decades, have contributed in various ways to the growth and consolidation of these specialties. While it would be impossible to name each of them, we would like to express our deepest appreciation to all those who have left their mark on this noble work.

We especially highlight the valuable contribution of the nursing staff, whose dedication and professionalism have been fundamental in the comprehensive care of our patients; the tireless work of social work and administrative staff, who have facilitated humanitarian care and access to medical services; and the work of stretcher-bearers, intendants, cooks, and porters, who with their daily effort guarantee the optimal operation of the service.

We also thank our dear patients, who give meaning to our existence, work, and reason for being. They inspire us to continue with an attitude of service and compassion, reaffirming our commitment to quality care and respect for human dignity.

The progress achieved would not have been possible without this spirit of collaboration and dedication. Today, more than ever, we reaffirm our commitment to medical excellence, humanitarian service, and the vocation to continue working for the health of our community. To all of you, our most sincere thanks.

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Protection of humans and animals. The authors declare that no experiments involving humans or animals were conducted for this research.

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HISTORY ARTICLE

History of the pediatrics service since its creation

Silvia Uriega

Pediatrics Service, Hospital General de México Dr. Eduardo Liceaga, Secretaría de Salud, Mexico City, Mexico

To talk about the History of the Pediatrics Service of the *Hospital General de México, Dr. Eduardo Liceaga* is to go back to the beginnings of the hospital since its creation where the preliminary project for its foundation was proposed around 1900, where 13 Pavilions were built, among which was considered a space assigned for the care of the child which was located in pavilion 23 with 31 beds.

In 1934, the pediatrics service was inaugurated which had an outpatient consultation, an emergency area, hospitalization for infants and preschoolers, as well as an operating room, in that same year, the new gynecology-obstetrics service (La Maternidad del 30) was created, which is called Dolores Sáenz de Labiel being the Head of the Service Dr. Rábago and the Head of the Pediatrics Section Dr. Porras Gaytán remaining until January 14, 1946, to continue in the position Dr. Salvador Alvarado. At that time, there was a Joint Room, with 12 drawers that were lined with wire with a spotlight for premature patients.

Around 1956, it was proposed that an annex be built to pavilion 30, which was completed in 1957, where the gynecology and obstetrics consultation was installed, as well as pediatrics, at that time, there were already incubators. A milk bank is also set up and the joint room continues. In relation to teaching in pediatrics, four courses were taught, of which the Principal was Dr. Hermilo Castañeda. In 1957, Dr. Beatriz Anzures joined to participate in the maternity of the 30th invited by Dr. Alfaro de la Vega, with the position of head of the department of pediatrics of the maternity of Pavilion 30.

In 1960 and under the direction of Dr. Clemente Robles and being the deputy director Dr. Ortiz de Montellano, Dr. Anzures was asked for the preliminary project of the pediatrics service. Being in July 1963, the service was inaugurated, with Dr. Ramos Álvarez as chief, and Miss Miss as head of nurses. Faustina Farfán Guadarrama; a surgical unit was also made by Dr. Beltrán Braum. Around 1968-69, the head of the service changed, and Dr. Humberto Saavedra was appointed to the position.

At the end of 1969, the new gynecology-obstetrics unit was inaugurated, with Dr. Alfaro de la Vega as head, having four nurseries with capacity for 50 newborns each, and Pavilion 30 was demolished, and the joint room was temporarily suspended. It was not until Dr. Irma Mendoza took over that it was restarted to be coordinated by pediatrics under the command of Dr. Espinoza Moret.

In 1970, the hospital career for pediatrics was opened with a call at the national level, being in June 1970 when Dr. Beatriz Anzures López, head of the pediatrics service, was appointed, having at that time 130 beds and room for 200 newborns in the gynecology-obstetrics unit, coordinated by pediatrics. In 1971, the authorization of the formal university residency in pediatrics was processed, and it was approved, from 1972 to 1975 a yearbook of pediatric literature was published with inter-institutional coordination. In 1973, the first anniversary conference of the pediatrics service was held, the first generation of residents graduated Dr. Sánchez Maya and Dr. Cruz Molina, from the second generation, Dr. Luis Emilio Salmón Rodríguez, who a few years

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later would succeed Dr. Anzures as head of the service. In the period from 1970 to 1985, three remodeling was carried out in the service, where the modified areas were the operating rooms, infectious diseases, the premature infant area, the milk laboratory, the archive, CEYE, the classroom, and the outpatient consultation.

On September 19, 1985, the structure of the *Hospital General de México Dr. Eduardo Liceaga* changed radically, after the earthquake in which the gynecology-obstetrics buildings and the medical residency were completely lost, killing nine resident doctors, two undergraduate interns, and two basic doctors. Around November 1985, the work of the hospital resumed by giving consultations in tents at the entrance of the Institution, while the corresponding expert reports were completed. By December, the hospital's outpatient clinic was reoccupied and in January 1986 the care of newborns and the pediatric emergency consultation was resumed in a cubicle in the adult emergency department, it was in mid-1986, when the pediatrics service was opened and the hospitalization of patients was restarted.

In 1987, Dr. Beatriz Anzures retired, leaving Dr. Luis Emilio Salmón Rodríguez in charge of the service. During the period of Dr. Salmón, the service was remodeled, such as the Medicine Area II, achieving its equipment for the care of low birth weight newborns, by 1992 the new kitchen was made and a remodeling of the outpatient clinic was carried out and four general consultation offices of pediatrics were added; pertinent modifications are made such as the realization of emergency exits, and a playroom and school for hospitalized patients, as well as the start of the kangaroo program for preterm or low weight newborns (Fig. 1).

In the same year, the National Breastfeeding Center was created, the main objective of which was to train medical, paramedical, and related personnel on the National Breastfeeding Program, and also to provide assistance and dissemination to the mothers of patients hospitalized in the service. In the same year, this institution was certified as a "Baby- and Mother-Friendly Hospital," and doctors from different states of the country were trained in breastfeeding. The gynecology-obstetrics service managed to build new facilities, being inaugurated in 1997, preserving areas such as joint room, the tocosurgical unit, adding the pathological nursery and a transitional nursery.

In 1998, the organization chart of the service was restructured, giving rise to 4 units (Neonatology, hospitalization, outpatient consultation, and surgery). In December of that year, Dr. Salmón Rodríguez retired from the head of service which was taken over by Dr. Francisco Mejía Covarrubias (Fig. 2), initiating with him, the project of the realization of the neurology clinic, which was inaugurated in 1999, as well as the allergy clinic was opened.

In 1999, the pediatrics service was recognized as a Comprehensive Care Center for Epilepsy. During the year 2000, one more remodeling was carried out, as follows: Emergencies, Neonatal Intensive Care Unit (NICU), Specialties (formerly infectious diseases) Medicines II, Hemato-Oncology (formerly Medicines I), and Surgery and Outpatient Consultation. In 2001, the Neonatal Intensive Care and Medicines II areas were transferred to the gynecology-obstetrics unit, integrating the neonatology unit, together with the intermediate therapy and pathological nursery; likewise, this year, the operating rooms were remodeled. For this reason, the area where the NICU was located was prepared for the Pediatric Intensive Therapy.

In 2003, the entire outpatient area was remodeled with 19 functional offices. That same year, Dr. Mejía Covarrubias ended his term as head of the service, succeeding him in the position Dr. Lino Eduardo Cardiel Marmolejo. The neonatology unit was remodeled in 2005, and the following areas were formed: Intensive care unit 14 places, intermediate therapy with 24 places, growth and development 21 places, and the transition area with eight places. At present, the areas identified in this unit are as follows: neonatal intensive care, intermediate therapy, growth and development nursery, joint room, and tocosurgical nursery, in which we can identify the areas of transition nursery and joint accommodation. In the same way, this unit has under its supervision and care the human milk bank, the lactation clinic, complemented in turn by the breastfeeding consultation, and finally, the neonatal follow-up consultation is also granted.

In 2005, the pediatrics service began its participation in the "let's keep learning in the Hospital Program." Received recognition and 2nd place in the national award "Education for Children and Adolescents Living with Chronic Disease and their Families," in the category of Educational Programs for Adolescents and Adults in November 2006; these activities are carried out in the classroom built for this purpose, with the collaboration of the Bachelor of Primary Education Hugo Antonio Soto Pérez, until 2011; and from then on, each year, the holder in charge of this work is different. Waiting and Dignified Treatment in the Emergency Area;

Figure 1. Entrance door of the pediatric service of the *Hospital General de México Dr. Eduardo Liceaga.*

Figure 2. Waiting room for the outpatient consultation area for pediatric specialties.

Figure 3. Inpatient surgical ward.

said prize consisted of the granting of $100,00.00 for the purchase of electromedical equipment (Fig. 3).

In the hospitalization unit in 2006, the outpatient chemotherapy room was created, with a capacity of six places. In 2008, the complete remodeling of the emergency and pediatric intensive care area was carried out with an installed capacity of 10 beds. With the support of the Hospital's Volunteers preceded by Carolina Silva de Navarro, in 2009, the Toy Library area was created, Mrs. María Elena Marqués; for patients who come to the outpatient clinic to this service. In 2010, the total remodeling of the pediatric hemato-oncology area began with the support of the Telethon Assistance Program, with a capacity of ten beds and a new outpatient chemotherapy area, with a capacity of six places, officially starting operations in October 2011.

Dr. Alejandro Echegaray del Villar took office as head of the service, in February 2011; during his management, the creation of the Research Coordination in February 2013 stands out, as well as the area of nutritional support in pediatrics (Clinical Nutrition) (Fig. 4), in the month of June. Similarly, at the beginning of 2013, the steps to form the human milk bank began, officially beginning its activities in September of the same year. Dr. Echegaray's term, for personal reasons, ended in September 2014, and Dr. Luis Paulino Islas Domínguez continued in office until February 28, 2017. During this period, the inhalation therapy area was relocated, to make way for the creation of the emergency assessment office, since the only space available was the TRIAGE office.

In December 2016, the relocation of pediatrics began the preparation and essential modifications in Pavilion 406, to satisfy, as far as possible, the needs of facilities that the pediatrics service required, to provide care to the pediatric patient.

Figure 4. Offices of researches, doctors, nutritionists and administrative areas.

On March 1, 2017, Dr. Verónica Firó Reyes is appointed Head of the Office of the Affairs of the pediatrics service; until that date, the modification of the structure of Pavilion 406 was kept on hold, and two extra areas were requested, the first, the one that would house the cardiology consultation for the granting of the general pediatrics consultation, as well as the area occupied by the pneumology and allergy consultation to allocate the offices for the care of specialty pediatrics.

It is in the month of September 19, 2017, that Mexico City was shaken by two earthquakes and pediatrics was relocated to Pavilion 302, making use, for the staff, part of the facilities of Pavilion 107; In addition to the above, and due to the lack of adequate facilities, the following were established: Pediatric emergencies, in a section of Pavilion 401, the performance of surgeries, in the transplant operating room of the surgical tower, outpatient chemotherapy, in a section of the chemotherapy area of the oncology unit, the otorhinolaryngology consultation, in Pavilion 101, and the general consultation, in offices provided from the adult outpatient area. On October 2, after conditioning the area in which cardiology would be consulted, the general pediatrics consultation began in the seven offices provided for it. On Tuesday, October 31, 2017, the completion of the specialty office area was delivered.

On Tuesday, March 20, 2018, the pediatrics service was inaugurated by the Secretary of Health Dr. José Ramón Narro Robles, the director of the Hospital, Dr. César Athié Gutiérrez, the graduates, Mónica Burillo Eguía Lis, Mónica Fernández Garibay and Pilar Botas Hidalgo, as well as by Dr. Verónica Firó Reyes. It is constituted from the date of the Emergency Department with places from 1 to 6; Surgery, from 7 to 26; Specialties from 27th to 32nd place; Infectious Diseases, with 10 beds, from 33rd to 42nd place; Hemato-Oncology, from 43rd to 52nd place; the Intensive Care Unit from bed 53 to 59; and for 5 spaces for outpatient chemotherapy, places 60-64.

On March 1, 2019, Dr. Carlos Fernando Mosqueira Mondragón, a pediatric surgeon specializing in Pediatric Urological Surgery, assumed the Head of the Pediatrics Service, introducing some subspecialties to the pediatrics service, the service is divided into the specialties consultation, whose head is led by Dr. Rubén Avilés Cobián. At the level of the pediatric hospitalization unit, Dr. Silvia Uriega González Plata is the head. Dr. Edgar Reynoso Argueta is head of the Neonatology Unit. Dr. Rogelio Torres Martínez directs the Pediatric Surgery Unit.

In Mexico, as in the rest of the world, there is an emerging pandemic. The causative organism of the same is the virus called SARS-CoV2 (COVID-19), which originated in December 2019, in the province of Wuhan, China. The presence of this virus was transmitted to various parts of the world, without there yet being a specific treatment and preventive treatment, such as a vaccine. The virus arrives in Mexico, which is why the Official Gazette of the Federation (D.O.F.) on III/23/2020 published the "AGREEMENT by which the General Health Council recognizes the epidemic of disease by the SARS-CoV2 virus (COVID-19) in Mexico, as a serious disease of priority attention, as well as establishing the activities of preparation and response to said epidemic." For the month of June 2022, the hospital will be reopened to the conditions that it was before the pandemic, Dr. Marlos Mosqueira concludes his term in June 2023 and Dr. Silvia Uriega González Plata continues to be in charge as head of service, who within her work plan proposes the creation of a department of teaching professionalization, strengthens research in the service and begins to produce theses with more than 30 projects, promoting scientific research from protocols and four publications in a year and months of management, the creation of the research committee authorized by the Research Directorate that allows educational and research sessions such as the "Journal Club" and sessions on "Rare Diseases in Pediatrics" to strengthen timely diagnosis and evidence-based therapeutic decisions In conjunction with the Genetics

Service, the "Virtual Classroom" is created in coordination with the Electronic Center for Information and Documentary Research for Health, strengthening undergraduate and graduate learning, at the same time "Pedialingo" is also created where residents through their correct answers can advance in the levels that are established for their learning.

Coordination is initiated to strengthen the clinical record as a fundamental part of patient care, the pediatrics team is integrated into different committees such as ethics, research with retrospective studies and biosafety, as well as different publications in indexed journals, both national and international.

Workshops are scheduled for residents during the year on research methodology, correct search for medical information and how to criticize medical articles. The rapprochement with the Mexican Academy of Pediatrics is achieved and the "College of Pediatricians of the Hospital General de México" is created, being able to have a presence in academic scenarios outside the hospital, it had never been possible to create it before.

At present, the pediatrics service has an emergency service, pediatric intensive therapy, hemato-oncology, medical specialties, surgery and general pediatrics outpatient consultation, as well as consultation of the different pediatrics medical specialties in both morning and afternoon shifts and a Child Welfare Unit in which advice and comprehensive treatment is provided to patients suffering from overweight. Obesity impacting their long-term metabolic health, there is a nutrition area that works in a multidisciplinary way with the cleft lip and palate clinic, the follow-up of children living with human immunodeficiency virus, pregnant adolescent women, and high-risk neonatal patients as well extremely premature infants.

The pediatrics service annually receives undergraduate, postgraduate, and medical and paramedical students from different universities that allow them to prepare in the service.

Commemorating the anniversary of the hospital is a source of pride for all the pediatricians who are part of the service, living the day to day with enthusiasm and also generating history in this great Institution.

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Conflicts of interest

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Ethical considerations

Protection of humans and animals. The authors declare that no experiments involving humans or animals were conducted for this research.

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HISTORY ARTICLE

Two decades of progress in coloproctology: pioneering precision colorectal cancer surgery and anorectal physiology

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Foundation and early years

Coloproctology began at our hospital in 1925, when Dr. Genaro Escalona assigned Dr. Abraham Ayala González and Dr. Leónides Guadarrama to study digestive diseases. In 1937, under the direction of Dr. Ignacio Chávez, the Gastroenterology Service was formalized. In 1957, in response to the need for specialized care in anorectal pathologies, the Proctology Section was created, led by doctors Leónides Guadarrama, Guillermo Haro y Paz, and Octavio Avendaño Espinosa, who was appointed head in 1958. In 1960, the remodeling of Ward 24 consolidated the Coloproctology Unit into several offices and a procedure room for exclusive use, allowing for greater specialization in anorectal diseases. In 1985, the 2-year coloproctology residency program, endorsed by the *Universidad Nacional Autónoma de México* (UNAM), was formalized.

Significant milestones in the modern era of our service

The Coloproctology Unit at the *Hospital General de México Dr. Eduardo Liceaga* continued to grow in terms of infrastructure and capacity, reaching a milestone in December 2006 with the first laparoscopic colon surgeries: a laparoscopic colectomy and a sigmoidectomy, both performed by Dr. Billy Jiménez Bobadilla, a physician attached to the unit. These procedures marked the beginning of minimally invasive colorectal surgery at the hospital, consolidating its position as a benchmark in Latin America. Since then, the number of laparoscopic surgeries has increased annually, allowing for greater specialization and improving clinical outcomes in the treatment of colorectal diseases.

Since 2012, Dr. Billy Jiménez Bobadilla has been the head of the Coloproctology Service and Professor of the University Course in Coloproctology. Under his leadership, and with his team, Dr. Juan Antonio Villanueva Herrero, Dr. Teresita Navarrete Cruces, Dr. Rosa Martha Osorio Hernández, and the rest of the affiliated physicians, the service has experienced remarkable growth, consolidating its prestige and expanding its activities in both teaching and specialized clinical care. In 2016, the Coloproctology Unit became independent from the Gastroenterology Department and the General Surgery Department, becoming an autonomous department. This change allowed for greater operational freedom, facilitating the development of more advanced and specific procedures for the treatment of diseases of the colon, rectum, and anus, which promoted specialization and improved clinical outcomes.

At present, the Coloproctology Service has clinics and a specialized unit: *Clínica de Cáncer de Colon y Recto* (CCCR), *Unidad de Fisiología Anorrectal y Piso Pélvico Posterior* (UFAR), and *Clínica de Enfermedad Inflamatoria Intestinal* (CEII). Both the clinics and the service unit organize annual continuing medical

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education courses, reinforcing their commitment to excellence in teaching. This has consolidated the service as a benchmark in coloproctology at the national and international level (Fig. 1).

Colon and Rectal Cancer Clinic

The Colon and Rectal Cancer Clinic was founded in 2015 and has been headed by Dr. Billy Jiménez Bobadilla since then. The clinic is a pioneer in adopting a multidisciplinary approach that brings together experts in coloproctology, oncology, radiology, radiation oncology, pathology, and other related services. This model allows for the design of personalized and coordinated treatment plans that optimize clinical outcomes and improve patients' quality of life (Fig. 2). In addition, the clinic is recognized for holding annual courses in March of each year, during Colon and Rectal Cancer Awareness Month, with renowned international speakers. Each year, papers are presented at national and international conferences, and multiple publications appear in specialized journals (Table 1).

Under the direction of Dr. Jiménez Bobadilla, present president of the Mexican Council of Coloproctology (2024-2026), Dr. Ana Jimena Iberri Jaime, adjunct professor of the specialty course, Dr. Lucero Janett Ortiz Pacheco, and Dr. Gerardo Maya Vacio, the Colon and Rectal Cancer Clinic (CCCR) has established itself as a center of reference and excellence in Mexico. Its academic and training approach has set a standard in the training of residents who complete their training in the program, who have the opportunity to participate in more than 300 highly complex surgical procedures annually. Among the most notable advances implemented by the CCCR are the transanal tumor resection (TAMIS) technique, navigation-assisted rectal tumor surgery, and guided surgery with planners for complex cases. In addition to its focus on surgical and medical treatment, the CCCR actively promotes research, which is reflected in scientific publications and academic presentations throughout the year (Fig. 3). This would not be possible without the effort, work, and dedication of the resident physicians in our department over the years.

Anorectal Physiology Unit

The Anorectal Physiology Unit was established in 2014, under the sustained executive leadership of Dr. Juan Antonio Villanueva Herrero, a distinguished colorectal surgeon and pelvic floor specialist recognized nationally and internationally for his contributions to colorectal disease management and academic research. As the most advanced and unique center of its kind in Mexico and Latin America, the unit is devoted to the diagnostic evaluation and comprehensive management — medical and surgical — of pelvic floor dysfunctions.

Its clinical excellence is underscored by the application of pioneering technologies, including three-dimensional high-resolution anorectal manometry and 3D endoanal and endorectal ultrasonography, supporting precise functional assessment and informed therapeutic strategies.

The unit further distinguishes itself by offering innovative modalities such as laparoscopic pelvic surgery, medical therapy and neuromodulation, enhancing outcomes in complex pelvic floor disorders. In 2018, the team achieved the first implantation in the region of a sacral neuromodulator for fecal incontinence, solidifying the unit's role as a regional and national referral center for advanced care.

Recognizing the importance of academic advancement, in 2016 the unit initiated the Postgraduate Program in Anorectal Physiology and Pelvic Floor, endorsed by the UNAM and unique within the country, providing specialized training for physicians in state-of-the-art diagnostic and therapeutic techniques. This program has set a benchmark for specialist formation nationwide.

Dr. Villanueva Herrero is editor-in-chief of the *Revista Mexicana de Cirugía Colorrectal*, bringing further international prestige to the unit. He has contributed substantially to national clinical practice guidelines, served as consultant and scientific advisor for multiple major medical organizations, and mentored over 70 graduate theses, reflecting his continuous commitment to excellence in clinical care, research, and education. The Anorectal Physiology Unit welcomed Dr. Jeziel Ordoñez-Juárez in 2025, following her distinguished tenure as chief resident during her colorectal surgery training. Dr. Ordoñez-Juárez has rapidly emerged as a driving force for academic excellence and research advancement within the unit, significantly expanding its scholarly output and research capabilities.

Inflammatory Bowel Disease Clinic

In 2008, due to the increase in cases of ulcerative colitis, specialized care for patients with inflammatory bowel disease was initiated, with appointments scheduled for Monday afternoons. That year, the service pioneered the administration of infliximab, with the first

Table 1. The 10 most referenced articles published by the Coloproctology Service

Article title	Reference
Calidad de vida del paciente ostomizado	Charúa-Guindic L, Benavides-León CJ, Villanueva-Herrero JA, Jiménez-Bobadilla B, Abdo-Francis JM, Hernández-Labra E. Cirugía y cirujanos. 201;79 (2):149-55.
Comportamiento epidemiológico del cáncer de colon y recto en el Hospital General de México. Análisis de 20 años: 1988-2007	Charúa-Guindic L, Lagunes-Gasc, AA, Villanueva-Herrero JA, Jiménez-Bobadilla B, Avendaño-Espinosa O, Charúa-Levy E. Rev Gastroenterol Mex. 2009;74 (2):99-104.
Factores de riesgo asociados al desarrollo de fístula anal	Escobedo SUP, Bobadilla BJ, Herrero, JAV. Cirujano general. 2013;35 (1):25-31.
La neoplasia intraepitelial anal y la infección por virus del papiloma humano en pacientes anorreceptivos	Charúa-Guindic L, Esquivel-Ocampo EA, Villanueva-Herrero JA, Jiménez-Bobadilla B, Muñoz-Cortés SB, Leal-Tamez M, *et al.* Rev Gastroenterol Mex. 2009;74 (3): 195-201.
Evaluación de la utilidad pronóstica de los índices plaquetas-linfocitos y neutrófilos-linfocitos en pacientes con enfermedad diverticular complicada	Vela-Torres A, Dosal-Limón SK, Ramírez-García G, Sánchez-Rosado RR, Maya-Vacio GJ, Robles-Méndez-Hernández A, *et al.* Revista Mexicana de Cirugía Colorectal. 2023;3 (3):73-8.
La escala de control nutricional (CONUT) como predictor de gravedad de la enfermedad diverticular	Chávez-Hernández AF, Estrada-González HE, Aceves-Valdez M, Jiménez-Bobadilla B, Villanueva-Herrero JA, De-León-Rendón JL. Revista Mexicana de Cirugía Colorectal. 2023;3 (3): 59-65.
Análisis de las características clínicas y resultados de cirugía en pacientes con cáncer colorrectal en un hospital de tercer nivel en México tras regular la atención hospitalaria por la emergencia sanitaria de COVID-19	Juanz-González A, Dosal-Limón SK, Vela-Torres A, Jiménez-Bobadilla B, Villanueva-Herrero JA, Maya-Vacío GJ, *et al.* Revista Mexicana de Cirugía Colorectal. 2023;3 (3):66-72.
Biorretroalimentación con electroestimulación para el tratamiento de la disinergia defecatoria	Cruz-Torrico SW, Villanueva-Herrero JA, Jiménez-Bobadilla B. Revista Mexicana de Cirugía Colorectal. 2023;3 (3):85-9.
Indicaciones y complicaciones de la cirugía en enfermedad inflamatoria intestinal	De León-Rendón JL, Sánchez-Rosado RR, Villanueva-Herrero JA, Jiménez-Bobadilla B. Revista Mexicana de Enfermedad Inflamatoria e Inmunomedicina. 2023;97 (2):29-37.
Internal anal sphincterotomy	Villanueva-Herrero JA, Henning W, Sharma N, Deppen JG. Internal. [Updated 2022 Oct 3]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK493213/

Figure 1. Coloproctology Service staff surgeons: Dr. Lucero Ortiz Pacheco, Dr. Jeannille González Ledo, Dr. Gerardo Maya Vacio, Dr. Ulises Pérez Escobedo, Dr. Rosa Martha Osorio Hernández (retired), Dr. Jeziel Ordoñez Juárez, Dr. Billy Jiménez Bobadilla, Dr. Juan Antonio Villanueva Herrero. Also included in the picture are our colorectal surgery residents, fellows of the Anorectal Physiology Unit, and administrative staff members: Ms. Ursula Villegas Allende, and Ms. Guadalupe Arrieta Ramírez.

infusion performed in August 2008 on a patient with perianal Crohn's disease and anovaginal fistula. In 2010, its use was extended to patients with hidradenitis suppurativa. During 2010-2020, given the lack of regular access to biologics, surgery was the main treatment for those who did not respond to conventional therapies. Throughout these years, there were several attempts to formalize a specialized clinic for these patients.

Figure 2. Dr. Ulises Pérez Escobedo, staff surgeon and associate of the Colorectal Cancer Clinic of the Coloproctology Service; Dr. Juan Antonio Villanueva Herrero, Head of the Anorectal Physiology Unit; Dr. Alma Rosa Sánchez Conejo, General Director of Hospital General de México, and Dr. Billy Jiménez Bobadilla, Chief of the Coloproctology Service.

Figure 3. Latin American Ultrasound Course 2024, held at the *Hospital General de México Dr. Eduardo Liceaga,* with Dr. Fernando de la Portilla, head of the Coloproctology Department at the *Hospital Virgen del Rocío* in Seville, Spain, as the keynote speaker.

The Inflammatory Bowel Disease Clinic (CEII) was established in 2023 under the direction of Dr. Jorge Luis De León Rendón, making it the first clinic in Latin America run by a coloproctology service. This unique feature allows it to offer comprehensive, specialized medical and surgical care. The CEII operates with a multidisciplinary team that coordinates care with related specialties, ensuring a personalized approach for each patient.

The CEII has an infusion center specializing in advanced biological therapies, offering safe and effective treatment. Since its opening, it has improved patients' quality of life, reduced hospitalizations, and significantly reduced the number of surgeries performed on patients.

Specialized activities

In 2007, the Coloproctology Service, in conjunction with the Gynecology and Obstetrics Colposcopy Clinic, implemented high-resolution anoscopy (HRA) to detect premalignant lesions caused by anal HPV, with a first publication in 2010. We currently have our own colposcope and a specialized anal HPV consultation service focused on the prevention and comprehensive treatment of these lesions.

As the only service within the public hospital system in Mexico to implement laser technology for anorectal pathology, we have established laser-assisted procedures for the treatment of hemorrhoidal disease, anal fistulas, pilonidal sinus disease, and human papillomavirus-related lesions. This minimally invasive approach utilizing 1940-nm laser technology enables precise tissue ablation with preservation of sphincter function, resulting in reduced postoperative pain, accelerated recovery, and lower complication rates compared with conventional surgical techniques.

With the dedication of Dr. Agustín Guemes Quinto and Dr. Luis Enrique Bolaños Badillo to intestinal reconstruction, our service has successfully addressed the substantial clinical need for restoration of bowel continuity at this institution and throughout the country, while advancing minimally invasive surgical techniques to improve quality of life for patients with ostomies.

Human resources and equipment

The service comprises 11 board-certified colorectal specialists who provide comprehensive clinical coverage. Outpatient consultation services are available monday through friday during morning hours, with 100 daily patient consultations conducted across specialized clinics dedicated to coloproctology, colorectal cancer and rectal surgery (CCCR), specialized procedures, anorectal physiology, and pelvic floor rehabilitation, in addition to designated offices for external consultation and institutional referrals. Under the directorship of Dr. Ulises Pérez Escobedo, specialist coverage extends to weekends and holidays, while overnight colorectal surgery coverage is provided by Dr. Hamzeh Bandeh Moghadam. The service operates with continuous 24-hour emergency surgical coverage and performs scheduled surgical procedures Monday through Sunday. Daily diagnostic capabilities include 10 high-resolution anorectal manometry studies and 10 endoanal ultrasound examinations, with 15 daily pelvic floor rehabilitation therapy sessions. The surgical volume averages 50 highly specialized colorectal procedures weekly, with

optimal resource utilization achieved through simultaneous operation of three operating rooms on mondays.

The future

The future of the Coloproctology Service looks promising, with a focus on technological innovation and resource optimization. We are working with the authorities to acquire a robotic system that will allow us to perform surgeries with greater precision. Other strategic areas for the future of the service include:

- Pre-habilitation in colorectal surgery: we seek to reduce hospital stays and accelerate the comprehensive recovery of patients.
- Indocyanine green: this technology allows for the evaluation of intraoperative tissue perfusion, reducing the risk of complications, such as anastomotic dehiscence.
- Artificial intelligence (AI): integrating AI into surgical decision-making and diagnosis.
- Telemedicine: in pre- and post-operative consultations, allowing closer monitoring of the patient without the need for displacements.

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Declaration on the use of artificial intelligence. The authors declare that no generative artificial intelligence was used in the writing of this manuscript.