

## The woman in neurosurgery at the National Institute of Neurology and Neurosurgery

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### Abstract

Women have always had a hard time in the history of medicine; Dr. Isabel Blackwell was the first woman in history to practice medicine. Dr. Diana Beck became the world's first female neurosurgeon. The first Latin American female neurosurgeon was Dr. María Cristina García Sancho y Álvarez-Tostado. All of these women had to face a large number of social, cultural, and economic obstacles in their path; however, this situation has changed gradually. Dr. Ana Lilia Siordia Karam was the first neurosurgeon to graduate from INNN. Nineteen years later the second female neurosurgeon at this institute was Dr. María Petra Herrera Guerrero. During their time at this institute they endured a lot of difficulties, especially with most of their coworkers; however, some coworkers treated them with respect and no gender distinction. Nowadays, four of the 25 total neurosurgery residents at INNN are women, and even though some of them have had to endure acts of gender discrimination, the general situation has changed. With work and respect, women have managed to have a larger role in the surgical field. We hope that in the near future a gender discrimination-free environment will be achieved in medicine and its specialties.

**KEY WORDS:** Women. Female Neurosurgeons. Neurosurgery.

The path of women throughout the history of medicine has been complicated, ever since the year 300 BC, when Agnodice of Athens entered the University of Alexandria dressed up as a man, under the protection of Herophilus of Chalcedon and Erasistratus. Owing to her success, her colleagues accused her of sexually abusing her patients; when she defended herself by revealing she was not a man, she was sentenced to death. The punishment was not carried through owing to pressure exerted by her patients, and she was thus allowed to practice medicine<sup>1</sup>. It was until January 11, 1849 that Dr. Isabel Blackwell, in the USA, officially became the first woman to practiced as a physician in the world<sup>2</sup>. It took 38 more years for the first female surgeon physician to graduate in Mexico: Dr. Matilde Montoya Lafragua, in 1887<sup>1</sup>.

In neurosurgery, the role of women goes back to the 15<sup>th</sup> century and it is described in works performed by *Cerrahiyyetu'l-Haniyye* (1385-1470), an Ottoman surgeon, whose most prominent work was *Cerrahiyyetu'l-Haniyye* (Imperial surgery), where *Tabibas* (female surgeons) are shown using a scalpel to extract a dead fetus due to hydrocephaly<sup>3</sup>.

In Mesoamerica, women also played an important role as midwives. Mesoamerica, currently defined as a demarcated cultural super-area that comprises a considerable stripe of the Mexican territory, is highly important, since both pregnancy and delivery care were in charge of the midwife. She was indispensable, as she was the only trained woman with the medical knowledge required to help with these procedures. The midwife's task did not conclude with helping at delivery,

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**Table 1. Percentage of women graduated in health sciences**

Region	Life sciences	Physical sciences
Latin America and the Caribbean	67	51
North America and Eastern Europe	60	43
Central Asia	68	44
Western Asia and the Pacific	60	58
Arab States	73	61
Central and Western Europe	70	54

Modified from UNESCO<sup>11</sup>.

since she continued looking after the newborn and the mother<sup>4</sup>.

However, it was until the 20<sup>th</sup> century that women began to formally specialize. Dr. Diana Beck, from the United Kingdom, was the first female neurosurgeon in 1939<sup>5</sup>. Ever since, women’s participation began in other countries such as Turkey in 1959 and Iran in 1984. In 1961, Dr. Ruth Kerr Jakoby became the first female diplomatic of the American Board of Neurological Surgery<sup>2</sup>.

In Latin America, the first female neurosurgeon of this region was Mexican, Dr. María Cristina Sancho y Álvarez-Tostado, born in the city of Guadalajara in 1919 and graduated from the National Autonomous University of Mexico (UNAM – *Universidad Nacional Autónoma de México*) Faculty of Medicine in 1947. She made her training at the Institute of Neurosurgery and Cerebral Research of Santiago de Chile, tutored by Dr. Alfonso Asenjo Gómez, which she concluded in 1951. At her return to Mexico, she joined the *La Raza* General Hospital, of the Mexican Institute of Social Security,

and later she was appointed head of the neurosurgery department of the National Cancer Institute. Dr. García Sancho passed away on February 21, 2013<sup>6</sup>.

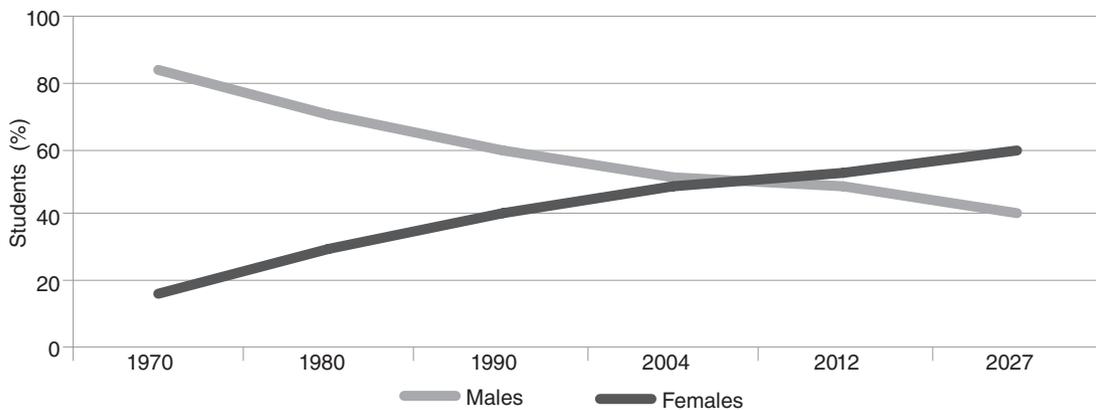
All these women had to face serious social, cultural and economic obstacles. However, this situation has gradually changed in Mexico and the world. Data from the United Nations Educational, Scientific and Cultural Organization (UNESCO) show that the number of women graduated in sciences is increasingly higher (Table 1).

In Mexico, the percentage of women admitted to medical schools has also importantly increased, from 15% in 1970 to 52% in 2012<sup>7</sup> (Fig. 1).

This situation is similar for the number of applicants selected in the Medical Residencies National Exam (ENARM – *Examen Nacional de Residencias Médicas*), with 50% being of the female sex and 50% of the male sex<sup>8</sup>; however, inclination towards certain specialties according to sex continues to exist. This way, “feminized” specialties are pediatrics, medical genetics, rehabilitation medicine and family medicine, whereas general surgery, orthopedics, internal medicine, emergency medicine and forensic pathology are regarded as “masculinized”. Others, such as epidemiology, psychiatry and ophthalmology remain equal in preferences. Neurosurgery remains a “masculinized” specialty, since only 8.5% of residents in this area are women<sup>8</sup>, and this situation is not exclusive to our country, since in USA and Japan, the percentage of female neurosurgeons is 15% and 3.4%, respectively<sup>9,10</sup>.

### Panorama at the INNN

The National Institute of Neurology and Neurosurgery (INNN – *Instituto Nacional de Neurología y*



**Figure 1.** Percentage of males and females admitted to medical schools in Mexico (modified from Sánchez-Guzmán MA, Corona-Vázquez T. Inserción de las mujeres en la ciencia. *Gac Med Mex.* 2009;145:71-6).

*Neurocirugía*) was opened on February 28, 1964, with the first neurosurgeons graduating in 1968. In 1982, Dr. Ana Lilia Siordia Karam was the first female neurosurgeon to graduate from the IMMM. Native to Torreón, she graduated in medicine at the Autonomous University of Coahuila and joined the INNN in 1979. She returned to her home city, where she practiced at the Institute of Services and Social Security for State Workers hospital of the city of Torreón, as well as at the University Children's Hospital, and subsequently at the University General Hospital, and was retired in 2012. Currently, she continues to practice in the private setting. Nineteen years had to elapse for the second female neurosurgeon to graduate, Dr. María Petra Herrera Guerrero, graduated from the Autonomous University of Querétaro. She entered the residency in 1996 and was the first female neurosurgeon to be appointed chief resident for all INNN specialties. She was granted an endoscopic neurosurgery fellowship at the Rainbow Babies and Children's Hospital (Cleveland, Ohio, USA) in 2001. Currently, she continues to practice as a neurosurgeon in San Juan del Río (Querétaro). In 2000, Dr. Ana Julia Rodríguez Payán was accepted. More than one lustrum had to elapse for another woman to be admitted, Dr. Patricia Reyes, graduated from the School of Medicine of León, who was admitted in 2009 and graduated in 2013. Subsequently, she made the High Specialty Course in Epilepsy and currently she is studying the Pediatric Neurosurgery subspecialty.

### **Situations experienced by the first female neurosurgeons**

Although many were productive and significant experiences related to their training and to the motivation to be in contact with neurosurgical pathologies, from the gender discrimination point of view, some were complicated and sometimes involved harassment. They remember having experienced a difficult admission process, in spite of their excellent grades.

During their stay as residents, they refer having had difficulties in the area of interpersonal, working and social relationships with their peers, since some incurred gender discrimination acts, with a poor environment in terms of respect being developed, which sometimes even spread to the nursing personnel, staff physicians and faculty. However, there were exceptions

and some workmates treated them with the fairness and respect they deserved, with regard to their condition of resident physicians, with no gender distinction.

Currently, four of all 25 (16%) INNN neurosurgery residents are females, and although some still lived through difficult experiences with regard to gender discrimination, the general situation has changed since, today, respectful and ethical treatment has been promoted not only towards women, but towards all residents in the institution, and it includes gender equity and fight against discrimination.

With work and respect, women have managed to have increasingly greater presence within the medical-surgical field, and it is hoped for female doctors who decide specializing in neurosurgery and other surgical areas to be able to do it without the stigma of the gender equity subject and with an egalitarian conscience for their human development and professional life project.

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### **References**

1. Castañeda López G. Desafiando a la tradición: las primeras egresadas de las escuelas de medicina de México 1887-1936. México: Academia Nacional de Medicina de México; 2014. 98 p.
2. Spetzler RF. Progress of women in neurosurgery. *Asian J Neurosurg.* 2011;6:6-12.
3. Bademci G. First illustrations of female "Neurosurgeons" in the fifteenth century by Serefeddin Sabuncuoglu. *Neurocirugía.* 2006;17:162-5.
4. López Miranda KP PTE. El valor de la procreación y el embarazo desde la cosmovisión mesoamericana. *Antropomorfas.* 2012;2:45-58.
5. Gilkes CE. An account of the life and achievements of Miss Diana Beck, neurosurgeon (1902-1956). *Neurosurgery.* 2008;62:738-42.
6. Castañeda López G. María Cristina García-Sancho y Álvarez-Tostado: primera neurocirujana en Latinoamérica. *Salud Mental.* 2010;33:111-21.
7. Corona TM, Ortosky M, Sartri P, Uribe E. La mujer y la salud en México. México D.F.: CONACYT; 2014. 329 p.
8. Graue-Wiechers E, Guevara-Gúzman R, Ostrosky-Wegman P. La feminización de la medicina en la educación médica y áreas biomédicas. En: Corona-Vázquez T, Medina-Mora ME, Ostrosky-Wegman P, Sarti-Gutiérrez E, Uribe-Zuñiga P, editores. *La mujer y la salud en México.* México, D.F: Intersistemas; 2014. p. 127-50.
9. Kato Y, Mihara C, Matsuyama J, et al. Role of women in medicine: a look at the history, the present condition and the future status of women in the surgical field, especially neurosurgery. *Minim Invasive Neurosurg.* 2004;47:65-71.
10. A. A. President's message 2010: an incredible year for WINS. But much left to do. *Women in Neurosurgery Spring 2010 Newsletter.* (Actualizado el 25 de abril de 2011; consultado el 2 de julio de 2015.) Disponible en: <http://www.neurosurgerywins.org/news/newsletter/currentnewsletter.pdf>
11. UNESCO. Atlas mundial de la igualdad de género en la educación. 2012. (Consultado el 2 de julio de 2015.) Disponible en: <http://www.uis.unesco.org/Education/Documents/unesco-gender-education-atlas-2012-spa.pdf>