

# Herstory of the Korean Women Neurosurgical Society since 2008

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The Korean Women Neurosurgical Society (KWNS) was founded in 2008. To commemorate its 10th anniversary, herein we review its history and the status of Korean Neurosurgical Society (KNS)-certified women neurosurgeons. Based on the academic and social activity of the KWNS, we can expect to promote professional work as members of the KNS, facilitate interaction among neurosurgeons, and sustain professional careers.

**Key Words :** History · Neurosurgery · Women.

## INTRODUCTION

According to 2017 statistics on doctors in South Korea, 121572 doctors were registered with the Ministry of Health and Welfare, 25.4% of whom were women. According to the Korean Medical Association, in 2017, 101618 doctors reported to doctors' associations, with a gender ratio of 77689 male physicians (76.1%) to 23929 female physicians (23.9%). According to 2018 statistics on Korean neurosurgeons, 3169 neurosurgeons were registered (2.6% of all Korean doctors), and among these, 53 were women neurosurgeons (0.04% out of all Korean doctors).

In the history of women specialized in neurosurgery, the first woman neurosurgeon in the world was Diana Beck, M.D. (1902–1956) of the United Kingdom<sup>1)</sup>. During her 31-year ca-

reer, she was the only woman neurosurgeon in Western Europe and the United States. Her original research, case reports, and seminal paper were related to the surgical treatment of intracerebral hemorrhage. In 1961, Dr. Ruth Kerr Jakoby was appointed the first woman diplomat of the American Board of Neurological Surgery<sup>5)</sup>. In addition to her neurosurgical career, she developed an interest in medical-legal issues as a lawyer. Dr. Thanjavur Santhanakrishna Kanaka, who completed her degree (MCh) in neurosurgery in 1968, is widely recognized as Asia's first female neurosurgeon. Her remarkable research contributed to the field of stereotactic surgery. In Japan, Dr. Yoko Kato was promoted as a full professor and became the first female professor of neurosurgery in 1984<sup>3)</sup>. She founded the Women's Neurosurgical Association of Japan in 1990 and the Asian Women's Neurosurgical Association in

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1996. She suggested that women’s abilities should be developed further with the help of day care centers, reemployment, worksharing, team medicine, and neurosurgeons’ societies and politics, and that this effort would also broaden the minds of male neurosurgeons. Dr. Hyo-Sook Chung became the first woman neurosurgeon in the history of South Korea in 1983, and became the first president of the Korean Women Neurosurgical Society (KWNS). Dr. Moon-Sun Park became the first full professor of neurosurgery in 2011. She majored in cerebrovascular neurosurgery and led the KWNS as its second president.

In the history of women’s neurosurgery associations, Dr.

Deborah Benzil was a driving force behind the 1989 founding of Women in Neurosurgery (WINS) and became the first president of WINS in 1990<sup>5)</sup>. WINS encourages the involvement of its members in neurosurgery organizations and serves as a resource for the American Association of Neurological Surgeons, Congress of Neurological Surgeons, and other neurosurgical and medical organizations at the local, state, and national levels<sup>4,6)</sup>. Dr. Karin Muraszko, a pediatric neurosurgeon at the University of Michigan, became the first woman to be appointed chair of a residency training program approved by the Residency Review Committee in 2004. The KWNS was founded in 2008 and to commemorate its 10th



**Fig. 1.** Ceremony of the Korean Women Neurosurgical Society. A : The inauguration ceremony during the Korean Neurosurgical Society annual spring meeting in 2008 (counter-clockwise from bottom left : Drs. Tae-Young Jung, Eun-Young Kim, Hyo-Sook Chung, Moon-Sun Park, So-Hyoung Im, Eun-Kyung Park, Jin-Kyung Kim, Ji-Young Cho, Ji-yeoun Lee, In-Kyeong Kim, Soo-Eon Lee, and Seung-Jung Baek). B : The celebration party of the 10th anniversary of the Korean Women Neurosurgical Society in 2018 (from left to right : Drs. Thi-Hoang-Oanh Duong, Eun-Kyung Park, Mi-Kyung Kim, Woohyun Kim, Seonah Choi, Soo-Jeong Park, Moon-Sun Park, Seung-Won Choi, Eun-Young Kim, Ji-Hee Kim, Na-Young Jung, Woo-Kyung Kim, Hye-Ran Park, Tae-Young Jung).



**Fig. 2.** Portrait of the presidents of the Korean Women Neurosurgical Society. A : The first president, Dr. Hyo-Sook Chung, in conference (from left : Drs. Jung-Ran Cho, Hyo-Sook Chung, and Moon-Sun Park). B : The second president, Dr. Moon-Sun Park.

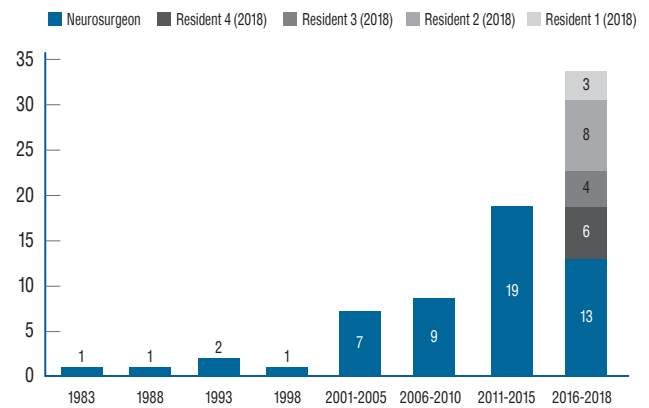
anniversary, herein we review its history and the status of Korean Neurosurgical Society (KNS)-certified women neurosurgeons. Based on the academic and social activity of the KWNS, we can expect to promote professional work as members of the KNS, facilitate interaction among neurosurgeons, and sustain professional careers.

## THE KOREAN WOMEN NEUROSURGICAL SOCIETY

The KWNS was founded on April 18, 2008 as a subgroup of the KNS<sup>2)</sup>. A special session on the KWNS was held during the KNS spring meeting and an inauguration ceremony was conducted (Fig. 1A). From 2008 to 2012, the first president of the KWNS was Dr. Hyo-Sook Chung, who was the first woman neurosurgeon in South Korea and worked in Hyeheha Neurosurgery Clinic (Fig. 2A). Dr. Moon-Sun Park, a professor of Daejeon Eulji Medical Center, Eulji University, became the second president in November 2012 (Fig. 2B).

Among the 3169 neurosurgeons in South Korea in Decem-

ber 2018, 53 (1.7%) were women neurosurgeons in the KWNS. These KWNS members were trained in 26 hospitals. Among the 335 residents in 2018, 21 (6.3%) were women residents.



**Fig. 3.** The numbers of Korean Neurosurgical Society (KNS)-certified women neurosurgeons in chronological order. In December 2018, the total number of KNS-certified women neurosurgeons was 53, leading the organization of a women’s meeting, which has gradually been increasing in attendance. Resident 4 (2018) : fourth year resident in 2018, resident 3 : third year resident, resident 2 : second year resident, resident 1 : first year resident.

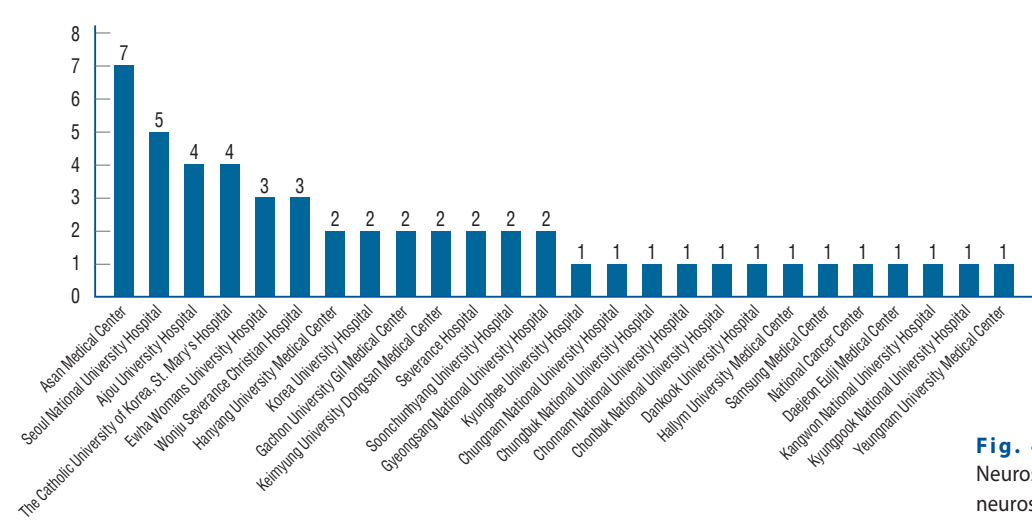
**Table 1.** The academic activity of KWNS on KNS spring and autumn meeting

Date	Program	Moderator	Content	Presenter
2008.4.18	Special Session		The inauguration of Korean Women Neurosurgical Society	
2014.10.17	Luncheon Seminar	Moon-Sun Park (Eulji Univ.)	How to make a career decision in the field of neurosurgery	Tae-Young Jung (Chonnam Univ.)
			To be a functional neurosurgeon-from a woman’s perspective	Eun-Young Kim (Gachon Univ.)
			To be a vascular neurosurgeon-from a woman’s perspective	Sook-Young Shim (Inje Univ.)
2015.10.16	Luncheon Seminar	Moon-Sun Park (Eulji Univ.)	Special guest lectures: Women doctor guarding work and family	Hwa-Sook Kim (Korean Women’s Medical Society)
			To be a pediatric neurosurgeon: my perspective	Eun-Kyung Park (Yonsei Univ.)
			To be a spinal neurosurgeon: women’s perspective	Ji-Young Cho (Gang-buk Wooridul spine hospital)
2016.9.30	Luncheon Seminar	Moon-Sun Park (Eulji Univ.)	Overseas training report	Yong-Sook Park (Chung-Ang Univ.)
			4th year woman vascular neurosurgeon’s daily life	Na-Rae Yang (Ewha Women’s Univ.)
			How to deal with investigation and trial	Ho-Jeong Kang (Law firm, Jipyong)
2017.10.13	Luncheon Seminar	Moon-Sun Park (Eulji Univ.)	Fundamental role of medical doctor in drug development	Young-Im Kim (Novartis Korea)
			Common symptoms and diseases in neurosurgeon outpatient	Ji-Hee Kim (Hallym Univ.)
			Application of botulinum toxin to nervous system disease	Eun-Young Kim (Gachon Univ.)
2018.10.13	Luncheon Seminar	Moon-Sun Park (Eulji Univ.)	Herstory of KWNS since 2008	Tae-Young Jung (Chonnam Univ.)
			The vision and mission of KWNS	Eun-Young Kim (Gachon Univ.)
			Machine-learning driven biomarker prediction for glioblastoma	Seung-Won Choi (Sungkyunkwan Univ.)

Univ. : university, KWNS : The Korean Women Neurosurgical Society

**Table 2.** Hospitals for women neurosurgeons in residency training program

Training hospital	No.	Years of KNS-certification (No.)
Hanyang University Medical Center	2	1983 (1), 2010 (1)
Kyunghee University Hospital	1	1988 (1)
Chungnam National University Hospital	1	1993 (1)
Korea University Hospital	2	1993 (1), 2014 (1)
Ewha Womans University Hospital	3	1998 (1), 2012 (1), 2017 (1)
Chungbuk National University Hospital	1	2001 (1)
Wonju Severance Christian Hospital	3	2001 (1), 2006 (1), 2015 (1)
The Catholic University of Korea, St. Mary's Hospital	4	2002 (1), 2018 (3)
Seoul National University Hospital	5	2003 (1), 2009 (1), 2010 (1), 2011 (1), 2014 (1)
Ajou University Hospital	4	2004 (1), 2013 (1), 2015 (1), 2018 (1)
Chonnam National University Hospital	1	2004 (1)
Chonbuk National University Hospital	1	2005 (1)
Dankook University Hospital	1	2006 (1)
Gachon University Gil Medical Center	2	2007 (1), 2017 (1)
Hallym University Medical Center	1	2007 (1)
Asan Medical Center	7	2008 (1), 2009 (1), 2011 (1), 2013 (1), 2014 (1), 2016 (1), 2017 (1)
Keimyung University Dongsan Medical Center	2	2011 (1), 2014 (1)
Samsung Medical Center	1	2011 (1)
Severance Hospital	2	2012 (2)
National Cancer Center	1	2014 (1)
Soonchunhyang University Hospital	2	2014 (2)
Daejeon Eulji Medical Center	1	2015 (1)
Gyeongsang National University Hospital	2	2017 (1), 2018 (1)
Kangwon National University Hospital	1	2017 (1)
Kyungpook National University Hospital	1	2017 (1)
Yeungnam University Medical Center	1	2018 (1)
Total number of neurosurgeon	53	



**Fig. 4.** The numbers of Korean Neurosurgical Society-certified women neurosurgeons at training hospitals.

The KWNS engages in academic and social activities. We publish newsletters that report news of individual members and KWNS activities. Regarding regular social activities, a ceremony is conducted for new KNS-certified women neurosurgeons and a dinner is held during the KNS annual autumn meeting. Regarding regular academic activities, a luncheon seminar for the KNS annual autumn meeting has been held since 2014 (Table 1). The president, Dr. Moon-Sun Park, moderated all seminars, and we focus on the promotion of professional growth for individual members, enhancement of member interaction, and maintenance of sustainable careers. To commemorate the 10th anniversary of the KWNS, we held a celebration party during the KNS annual meeting (Fig. 1B).

### THE STATUS OF KOREAN NEUROSURGICAL SOCIETY-CERTIFIED WOMEN NEUROSURGEONS

In December 2018, the total number of KNS-certified women neurosurgeons was 53, leading the organization of a women’s meeting, which has gradually been increasing in attendance (Fig. 3). The first female neurosurgeon finished

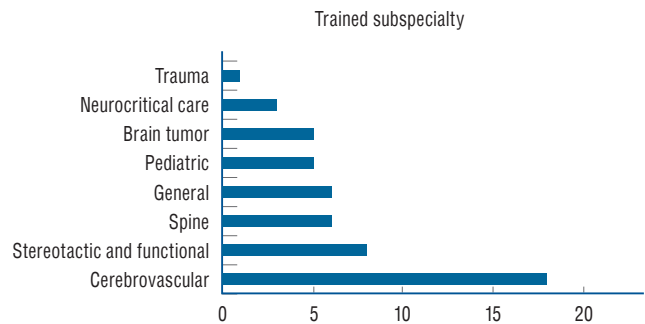
**Table 3.** Trained subspecialty and regional member of women neurosurgeon in 2018

	Value
<b>Trained subspecialty</b>	
Cerebrovascular surgery	18 (34.6)
Stereotactic and functional neurosurgery	8 (15.4)
Spinal neurosurgery	6 (11.5)
General neurosurgery	6 (11.5)
Pediatric neurosurgery	5 (9.6)
Brain tumor surgery	5 (9.6)
Neurocritical care	3 (5.8)
Trauma	1 (1.9)
<b>Regional</b>	
Seoul-Gyeonggi-Inchon (Gangwon, Jeju) Society	41 (78.8)
Daejeon-Chungcheong Society	4 (7.7)
Daegu-Gyeongbuk Society	3 (5.8)
Busan-Ulsan-Gyeongnam Society	2 (3.8)
Honam Society	2 (3.8)
<b>Total</b>	<b>52</b>

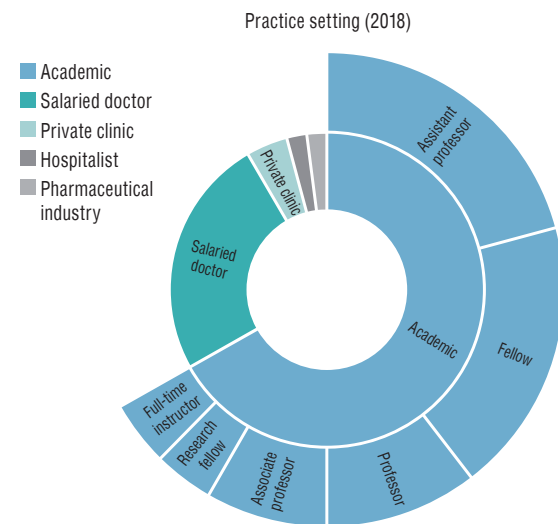
Values are presented as number (%)

training in 1983. Before 2000, five women neurosurgeons were registered in South Korea; from 2001 to 2005, seven women neurosurgeons were registered; from 2006 to 2010, nine women neurosurgeons were registered; from 2011 to 2015, 19 women neurosurgeons were registered; and from 2016 to 2018, 13 women neurosurgeons were registered. The number of women in neurosurgical residency programs was 21 in 2018, with 3 residents in the first year, 8 in the second year, 4 in the third year, and 6 in the fourth year.

There were 26 training hospitals for women neurosurgeons in South Korea (Table 2). The first training hospital for KNS-certified women neurosurgeons was Hanyang University Medical Center in 1983. Subsequently training hospitals were as follows : Kyunghee University Hospital in 1988, Chungnam National University Hospital in 1993, Korea University Hospital in 1993, Ewha Womans University Hospital in 1998, Chun-



**Fig. 5.** Subspecialties of Korean Neurosurgical Society-certified women neurosurgeons.



**Fig. 6.** Practice settings of Korean Neurosurgical Society-certified women neurosurgeons in 2018.

gbuk National University Hospital and Wonju Severance Christian Hospital in 2001, The Catholic University of Korea, St. Mary's Hospital in 2002, Seoul National University Hospital in 2003, Ajou University Hospital and Chonnam National University Hospital in 2004, Chonbuk National University Hospital in 2005, Dankook University Hospital in 2006, Gachon University Gil Medical Center and Hallym University Medical Center in 2007, Asan Medical Center in 2008, Keimyung University Dongsan Medical Center and Samsung Medical Center in 2011, Severance Hospital in 2012, National Cancer Center and Soonchunhyang University Hospital in 2014, Daejeon Eulji Medical Center in 2015, Gyeongsang National University Hospital, Kangwon National University Hospital, and Kyungpook National University Hospital in 2017, and Yeungnam University Medical Center in 2018. Among KNS-certified women neurosurgeons, seven were trained in Asan Medical Center, five in Seoul National University Hospital, four in Ajou University Hospital, four in The Catholic University of Korea, St. Mary's Hospital, three in Ewha Women's University Hospital, and three in Wonju Severance Christian Hospital (Fig. 4). Generally, there were one or two women neurosurgeons in each training hospital.

Regarding the subspecialties of KNS-certified women neurosurgeons after the completion of residency programs, 18 trained in cerebrovascular surgery (34.6%), eight in stereotactic and functional neurosurgery (15.4%), six in spinal neurosurgery (11.5%), six in general neurosurgery (11.5%), five in pediatric neurosurgery (9.6%), five in brain tumor surgery (9.6%), three in neurocritical care (5.8%), and one in trauma (1.9%) (Table 3, Fig. 5). In December 2018, most women neurosurgeons worked in academic institutes (n=32, 61.5%). Twelve neurosurgeons (23.1%) were salaried doctors, two worked in private clinics, one worked in the pharmaceutical industry, and one worked as a hospitalist. Of those working in academia, nine were in neurosurgery fellowships, two were research fellows, two were full-time instructors, 10 were assistant professors, four were associate professors, and five were professors (Fig. 6).

Regionally, most women neurosurgeons were members of the Seoul-Gyeonggi-Inchon Society (Gangwon, Jeju) (n=41, 78.8%), whereas four (7.7%) were members of the Daejeon-Chungcheong Society, three (5.8%) were members of the Dae-gu-Gyeongbuk Society, two (3.8%) were members of the Busan-Ulsan-Gyeongnam Society, and two (3.8%) were mem-

bers of the Honam Society (Table 3).

## FUTURE CONSIDERATIONS

Women neurosurgeons were isolated individuals rather than a minority group. The individual's barriers for active professional development may neither be obvious nor even acknowledged, but exist. However, as described thus far, we have achieved modest quantitative growth in the past decade. It is the next decade in which we will occupy a distinct area of the KNS and the South Korean medical community.

At this point, it is our duty to clearly define the role of our meeting in the new generation and to act responsibly in the new era. As a result of our deep discussions, we have decided on the missions and goals of the KWNS. First, the mission is to educate, inspire, and encourage female neurosurgeons in South Korea to understand their professional and personal goals and solve the inherent problems therein. Our goals are as follows : 1) to maintain professionalism and develop competency. 2) To create an environment that recognizes and supports individual values and individual diversity. And 3) to promote communication among members and to contribute to the development of the KNS.

To achieve these missions and goals, we will always try to help each member overcome obstacles and grow, and to contribute to the well-being and growth of our society, the KNS, the medical community, and the nation.

## CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

## AUTHOR CONTRIBUTIONS

**Conceptualization :** MSP

**Data curation :** TYJ

**Formal analysis :** TYJ

**Funding acquisition :** EYK

**Methodology :** TYJ

**Project administration :** MSP

Visualization : EYK

Writing - original draft : TYJ, EYK

Writing - review & editing : MSP

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