

Neurosurgical Training in Germany

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Although the world is experiencing a deficit in the neurosurgical [workforce](#), the number of [neurosurgeons](#) in [Germany](#) has increased within the last two decades.

The aim of the study of Ringel et al. was to assess the neurosurgical [workforce](#) in Germany, compare it to [European](#) countries, and assess structures in neurosurgical [departments](#) in Germany.

Data regarding the number of neurosurgeons in Germany as well as the number of departments, beds, cases, and neurosurgical procedures were gathered. A [survey](#) among German neurosurgical departments was performed to assess the structure of [neurosurgical care](#). Furthermore, another survey among European countries was performed to acquire information regarding the number of surgeons and the regulation of training.

From 2000 to 2019, the number of board-certified neurosurgeons in Germany increased by 151% from 973 to 2,446. During the same period, the German population increased by only 1% from 82.26 million to 83.17 million. Thus, the number of [neurosurgeons](#) per 100,000 inhabitants increased from 1.18 to 2.94. The increase of neurosurgeons is not paralleled by an increase in departments or an increase in neurosurgical procedures within the active neurosurgical departments. In comparison to the participating European countries, where the number of neurosurgeons per 100,000 inhabitants ranged from 0.45 to 2.94, with Germany shows the highest number.

German institutions of medical administration urgently need to consider [regulation](#) of neurosurgical specialist [training](#) to prevent a further uncontrolled increase in neurosurgeons in a manner that is not adapted to the needs of neurosurgical care for the German population. Actions might include a regulation of entry to the [training](#) and of the number of training sites. Furthermore, an integration of non-physician assistant health care professionals and delegation of non-surgical [workload](#) from neurosurgeons is necessary. A further increase in neurosurgeons would be associated with a decrease in the surgical caseload per surgeons during training and after board [certification](#), which might compromise the [quality](#) of neurosurgical care ¹⁾.[pital\]\]s](#).

Neurosurgery remains an attractive specialty in Germany, but there are two concerns that may impede its appeal in the near future. The administrative burden for a neurosurgeon is onerous: Perhaps 50 percent of a neurosurgeon's time is spent on administrative responsibilities such as coding and other tasks not involving patient care. Of perhaps greater concern is the limited pay. An

international ranking of physicians' pay published in Der Spiegel magazine in 2006 showed German doctors at the bottom, below their colleagues in other European countries as well as those in the U.S. and Australia. Physician pay in Germany increased by 10 percent after physician strikes in 2006, but the dissatisfaction with pay remains, as was evidenced in September by protests for higher physician pay and increased hospital funding. Neurosurgery is a hospital-based specialty, and most neurosurgeons are salaried employees of hospitals. Neurosurgeons, like most physicians, see private patients to supplement their income.

These concerns are likely to negatively influence the recruitment to neurosurgical training programs in the future. This problem is compounded by the fact that approximately 70 percent of medical students are women, to whom other specialties have appealed more than neurosurgery. Roughly one third of all neurosurgeons in Germany, including those already certified and those in training, are women.

The neurosurgical training program lasts six years, and trainees work 40 to 48 hours or 50 to 66 hours per week, depending on the state and local hospital arrangements. Providing adequate training within the prescribed time frame remains a challenge ²⁾

Little is known about the overall [training](#) experience and career opportunities for these [trainees](#).

Stienen et al. evaluated the current status of [neurosurgical training](#) of [residents](#) in [Germany](#).

An electronic survey was sent to European neurosurgical [trainees](#) between June 2014 and March 2015. The responses of German trainees were compared with those of trainees from other European countries. [Logistic regression](#) analysis was performed to assess the effect size of the relationship between a trainee being from Germany and the outcome (e.g., satisfaction, working time). Results Of 532 responses, 95 were from German trainees (17.8%). In a [multivariate](#) analysis corrected for [baseline](#) group differences, German trainees were 29% as likely as non-German trainees to be satisfied with clinical lectures given at their teaching facility (odds ratio [OR]: 0.29; 95% confidence interval [CI]: 0.18-0.49; $p < 0.0001$). The satisfaction rate with hands-on operating room exposure was 73.9% and equal to the rate in Europe (OR: 0.94; 95% CI, 0.56-1.59; $p = 0.834$). German trainees were 2.3 times as likely to perform a lumbar spine intervention as the primary surgeon within the first year of training (OR: 2.27; 95% CI, 1.42-3.64; $p = 0.001$). However, they were less likely to perform a cervical spine procedure within 24 months of training (OR: 0.38; 95% CI, 0.17-0.82; $p = 0.014$) and less likely to perform a craniotomy within 36 months of training (OR: 0.49; 95% CI, 0.31-0.79; $p = 0.003$). Only 25.6% of German trainees currently adhere to the weekly limit of 48 hours as requested from [the European Working Time Directive](#) 2003/88/EC, and in an international comparison, German trainees were twice as likely to work > 50 hours per week (OR: 2.13; 95% CI, 1.25-3.61; $p = 0.005$). This working time, however, is less spent in the operating suite (OR: 0.26; 95% CI, 0.11-0.59; $p = 0.001$) and more doing administrative work (OR: 1.83; 95% CI, 1.13-2.96; $p = 0.015$).

Some theoretical and practical aspects of neurosurgical training are superior, but a considerable proportion of relevant aspects are inferior in Germany compared with other European countries. This analyses provide the opportunity for a [critical review](#) of the local conditions in German training facilities ³⁾.

Survey on training satisfaction

As a resident representative, Lawson McLean et al. implemented a mailing list for interested German neurosurgical [trainees](#). Thereafter, they created a [survey](#) including 25 items to assess the trainees' [satisfaction](#) with their [training](#) and their [perceived career prospects](#), which they then distributed through the mailing list. The [survey](#) was open from 1st April until 31st May 2021.

90 trainees were enrolled in the mailing list and they received 81 completed responses to the survey. Overall, 47% of trainees were very dissatisfied or dissatisfied with their training. 62% of trainees reported a lack of [neurosurgical training](#). 58% of trainees found it difficult to attend [courses](#) or classes and only 16% had consistent [mentoring](#). There was an expressed desire for a more structured [Neurosurgical Resident Training Program](#) and [mentoring projects](#). In addition, 88% of [trainees](#) were willing to relocate for [fellowships](#) outside their current [hospitals](#).

Half of the responders were dissatisfied with their [neurosurgical training](#). There are various aspects that require improvement, such as the training curriculum, the lack of structured mentoring, and the amount of [administrative work](#). They propose the implementation of a [modernized structured curriculum](#), which addresses the mentioned aspects, in order to improve [neurosurgical training](#) and, consecutively, [patient care](#) ⁴⁾.

1)

Ringel F, Stoffel M, Krieg SM, Schöller K, Gerlach R, Conzen M, Schuss P, Kreutzer J; and; Beck J; Ressort 1 of the Neurosurgical Academy (NCA) of the German Society of Neurosurgery (DGNC) the Berufsverband Deutscher Neurochirurgen (BDNC). Structure of Neurosurgical Care in Germany in Comparison to Countries Organized in the European Association of Neurosurgical Societies: A Need to Reorganize Neurosurgical Training and Care in Germany. J Neurol Surg A Cent Eur Neurosurg. 2023 Jul;84(4):305-315. doi: 10.1055/a-1982-3976. Epub 2022 Nov 18. PMID: 36400110; PMCID: PMC10226811.

2)

<https://aansneurosurgeon.org/practicing-neurosurgery-in-germany/>

3)

Stienen MN, Gempt J, Gautschi OP, Demetriades AK, Netuka D, Kuhlen DE, Schaller K, Ringel F. Neurosurgical Resident Training in Germany. J Neurol Surg A Cent Eur Neurosurg. 2017 Jul;78(4):337-343. doi: 10.1055/s-0036-1594012. Epub 2016 Nov 30. PubMed PMID: 27903015.

4)

Lawson McLean A, Maurer S, Nistor-Gallo D, Moritz I, Tourbier M. [Survey](#) on training [satisfaction](#) among German neurosurgical [trainees](#). J Neurol Surg A Cent Eur Neurosurg. 2023 Mar 13. doi: 10.1055/a-2053-3108. Epub ahead of print. PMID: 36914157.

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