

REVIEW

From

Prof. Yavor Petkov Enchev, MD, PhD

Head of Clinic of Neurosurgery, University Hospital "St. Marina",

Varna 9010, bul. "Hristo Smirnenski" No1

Member of the Scientific Jury for the procedure

for appointment to the academic position "Professor"

in professional field 7.1 Medicine, scientific specialty "Neurosurgery",

for the needs of the Clinic of Neurosurgery

of "Acibadem City Clinic UMHAT Tokuda" Ltd,

announced in SG no. 98 of 24.11.2023

General:

On the grounds of Order No 15-05-09 for 31.01.2024, on the grounds of art. 4, para. 2 and art. 29a of the Law on the Development of Academic Staff in the Republic of Bulgaria (LDASRB), art. 2, para 2. of the Regulations for Implementation of the LDASRB, in accordance with the Regulations on the terms and conditions for acquisitions of academic degrees and occupying academic positions at Acibadem City Clinic University Hospital Tokuda and on the proposal of the Scientific Council (approved at the Scientific Council meeting with Protocol No. 49 of 01.11.2023) I present this review.

All necessary materials submitted by the applicant have been prepared precisely, fully complying with the requirements of the legal framework and the rules of the academic unit for the procedures for appointment to the academic position "Professor".

Education, qualifications and specializations:

Assoc. Prof. Vladimir Stefanov Nakov, MD, PhD was born in 1966. In 1992 he graduated in Medicine from the Medical University in Sofia. He acquired a specialty in Neurosurgery in 2000. He has qualification courses in cranial microsurgery (2015, Medical University, Copenhagen, Denmark), vascular microsurgery (2011, University Hospital, Zurich, Switzerland), surgical treatment of spinal fractures by mini-invasive techniques (2011, EASME, London, UK), AOSpine course on principles of treatment of spinal injuries (2008), course in treatment of degenerative disc disease (2008). In 2015 he defended a dissertation on the acquisition of educational and scientific degree "Doctor" on "Results of early surgical treatment of ruptured brain aneurysms". In 2010 he completed a course in professional qualification "Health Management".

Professional realization:

Assoc. Prof. Vladimir Nakov is consecutively a District Doctor at the Rural Health Service – Kostenets (1992–1993), Doctor at the Clinic of Neurosurgery at the University Hospital "Sv. Anna" – Sofia (1993–2010), Senior Doctor at the Clinic of Neurosurgery at the University Hospital "Sv. Anna" – Sofia (2010–2012), Head of Department at the Clinic of Neurosurgery of the Military Medical Academy – Sofia (2012–2016), Neurosurgeon at Acibadem City Clinic University Hospital Tokuda (2016–2017). Since 2017 he has held the academic position "Associate Professor" at the Clinic of Neurosurgery of "Acibadem City Clinic UMHAT Tokuda".

He has a total medical experience of 31 years, of which 30 years as a neurosurgeon.

Memberships in scientific societies:

Assoc. Prof. Dr. Vladimir Nakov is a member of the Bulgarian Society of Neurosurgery and the Congress of Neurological Surgeons (USA).

Research activities:

Scientific works

Assoc. Prof. Nakov provides a list of 27 original full-text articles published after the date of appointment to the academic position of Associate Professor. Of these, 14 articles are in database-indexed journals; 10 publications were published in journals with Impact factor (of Web of Science), and 9 – in journals with Scopus Scimago journal rank. The total Impact factor for the publications provided is 14.03. The H-index coefficient of Assoc. Prof. Vladimir Nakov in Scopus is 3.

The total number of points for indicator group "C", indicator 4 (habilitation work, 10 referenced articles) is 102.78 points, for indicator group "D", indicators 7 and 8 (publications in indexed and non-indexed journals) is 130.01 points. The total number of points for indicator group "D" is 206.61 points. Assoc. Prof. Nakov is the first author in 3 of the 39 full-text publications listed above and is a single author of none of them.

Assoc. Prof. Nakov provides a list of 37 participations in scientific forums after appointment to the academic position of "Associate Professor", of which 29 are at national and 8 – at international events. Twenty-five of the listed participations in national events are in Bulgarian and four of them – in English.

Citations

A reference review by NACID is presented for a total of 50 citations of the publications of Assoc. Prof. Vladimir Nakov in Scopus, Web of Science, etc. for the period after appointment to the academic position "Associate Professor" as of 19.01.2024. Of these, 32 citations are in database-indexed editions. Citations are mainly in renowned journals in the fields of neurosurgery, surgery and neurosciences – Neurosurgical Review (IF 2,8), Clinical Neurology and Neurosurgery (IF 1,9), Journal of Clinical Neuroscience (IF 2,0), Operative Neurosurgery (IF 2,3), Ophthalmic Plastic and Reconstructive Surgery (IF 2,0), PLOS One (IF 3,7), World Neurosurgery (IF 2,0/2022, 2,104/2020), Frontiers in Surgery (IF 1,8), Journal of Neurosurgery

(IF 4,1/2022, 5,115/2020), Frontiers in Neurology (IF 4,086), Neurosurgical Focus (IF 4,332/2021, 4,047/2020), Acta Neurochirurgica (IF 2,216), Journal of Clinical Neuroscience (IF 1,76), Rheumatic Disease Clinics of North America (IF 3,244), Journal of Healthcare Engineering (IF 1,295).

Thematic areas of scientific works:

1a. Surgical and endovascular treatment of ruptured and non-ruptured cerebral aneurysms (dissertation, publications 2, 7, 37, 38, 39).

Assoc. Prof. Nakov has significant scientific and clinical experience in cerebrovascular surgery, with special emphasis on surgical treatment of brain aneurysms. He has published numerous articles describing various surgical techniques and personalized treatment strategies. His innovative introduction of surgical techniques, such as clip reconstruction of complex aneurysms and clip-reconstruction in complex aneurysms after the establishment of a protective extra-intracranial bypass, allow a safer and more effective treatment of these challenging lesions. Publications include detailed descriptions of various surgical techniques for approach to, dissection and obliteration of aneurysms, as well as discussions on personalised treatment strategies based on specific indicators (38). Particular attention is paid to giant and unruptured aneurysms, which present unique challenges due to their size and potential for complications (39). He shares his extensive surgical experience by demonstrating surgical techniques, such as vertebro-basilar junction aneurysm dissection and clipping (2), and presents his personal contributions, such as the development of innovative surgical techniques and the analysis of complications of surgical treatment. The rich surgical experience of Assoc. Prof. Nakov allows him to analyze the various complications of the surgical treatment and to present conclusions, advice, and guidance on the avoidance or neutralization of these complications. This is especially important in the treatment of brain aneurysms, as their surgical treatment carries inherent risks, including stroke, bleeding, and damage to adjacent structures.

1b. Extra-intracranial bypass (12, 20)

In addition to his work with brain aneurysms, Assoc. Prof. Nakov has made a significant contribution to the field of extracranial-intracranial arterial bypass. He formulates and introduces

a reliable test, Colorcoded Duplex-Sonography, to refine suitable candidates for this type of surgery in patients with chronic insufficiency of cerebral circulation (12). This test helps identify patients who may benefit from bypass, thereby improving surgery outcomes and reducing the risk of complications. In addition, he has successfully performed extra-intracranial arterial bypass graft in patients with Moyamoya disease and in complex cases involving simultaneous occlusion of the internal and external carotid arteries (20). These advances demonstrate the author's flexibility and adaptability in addressing a wide range of neurosurgical challenges.

Throughout his career, Assoc. Prof. Nakov has led surgical teams in performing a large number of cerebrovascular operations, including over 300 aneurysms (176 after appointment to the academic position of Associate Professor) and 25 extra-intracranial bypasses. His scientific and clinical achievements have had a significant impact on the field of cerebrovascular surgery, especially in the treatment of brain aneurysms and chronic insufficiency of cerebral circulation.

2. Surgical treatment of mesenchymal vascularized tumors and CNS lesions (5, 13, 27, 29, 31).

In the field of treatment of mesenchymal vascularized tumors, Assoc. Prof. Nakov has 5 publications. Two of these articles are case reports describing successful surgical treatments of advanced high-risk mesenchymal tumors including the "carotid body" tumor and cervical intramedullary hemangioblastoma. One article includes an intraoperative video published in the "How I do it" section of *Acta Neurochirurgica*. The other two publications are chapters in the monograph "Neurosurgery", providing an overview of the current understanding of the pathogenesis, clinical manifestation and treatment of these rare brain tumors.

3. Cranial base surgery (4, 17, 19, 21, 22, 23, 32, 33, 34, 35, 36)

Assoc. Prof. Nakov has made significant contributions to the field of skull base surgery, having written eleven publications on various topics. Four of these papers have practical application and focus on different skull base approaches (4, 17, 21, 22). These include three articles on anterolateral transorbital access, including one article on innovative endoscopic transorbital and transverse access, and a publication with an experience-based review of the indications, technical nuances, results, and prevention of complication for anterior petrosectomy, retrolabyrinthine, and combined transpetrosal approaches. Two other publications of the author

are devoted to electrophysiological intraoperative monitoring during operations of the skull base, which is essential in the preservation of function of the cranial nerves (19, 23). The remaining publications are reviews, discussing various aspects of skull base surgery (32, 33, 34, 35, 36). In general, the author has considerable experience and contributions in the field of skull base surgery, especially in the development of various skull base approaches and the use of intraoperative functional neurophysiological monitoring to ensure favorable outcomes.

4. Intraoperative real-time functional physiological control (15, 19, 23, 24, 26).

Assoc. Prof. Nakov plays an active role in the processes of introduction of intraoperative neuromonitoring. Out of a total of five publications, in two the importance of electrophysiological control for improving the results of surgery and reducing complications in skull base surgery is presented (19, 23). One study (15) focuses on reversal of suboptimal neuromonitoring results by addressing operating room disturbances, inadequate electrode positioning, and variations in anesthesia. The other papers (24, 26) further support the importance of electrophysiological control for interventions in the area of primary motor cortex and of tumors in the diencephalic region, respectively.

4. Three-dimensional visualization of normal anatomical structures and pathological processes in neurosurgery (1, 6, 8, 9, 10, 11, 14, 16, 25)

Assoc. Prof. Nakov is involved in the development of algorithms for preoperative planning that can be integrated with virtual and mixed reality systems. This allows the surgical team to discuss and visualize the stages of surgery both in advance and directly over the patient, during the procedure using mixed reality. In addition, three-dimensional printing is successfully applied to cranial surgery (cranioplasty) and spinal surgery (for 3D models for preoperative planning). Methods for photorealistic 3D scanning of anatomical models for the purpose of training of graduate students and neurosurgical trainees have also been developed. This technology allows the creation of detailed, realistic 3D models of human organs and tissues that can be used to improve the understanding of complex anatomical structures and surgical techniques. A product of this technology is the www.3datlasofneurologicalsurgery.org project, which provides an online platform for sharing and exploring such 3D models among neurosurgeons around the world.

Participation in scientific projects:

Assoc. Prof. Nakov participated in three scientific projects led by Dr. Toma Spiriev. The first is an international project called "Three-Dimensional Photorealistic Atlas of Neurosurgery" (2022), funded by the Research Fund of the European Association of Neurosurgical Societies (EANS). This project involves researchers from the Clinic of Neurosurgery of Tokuda University Hospital, as well as from other institutions, including Sofia University, Germany, Denmark and Italy. The second and third projects are national projects funded by the Research Fund of Sofia University. These include "Neurovascular Layer Anatomy of Suboccipital Fossa in Revascularization of Posterior Cerebral Circulation" (2022) and "Training Students in Anatomy Using Three-Dimensional Photorealistic Direct Models Presented by Virtual and Augmented Reality" (2023). These projects aim to improve the medical students' understanding of human anatomy and to develop new teaching techniques.

Teaching activities:

After the date of occupying the academic position "Associate Professor" Assoc. Prof. Dr. Vladimir Nakov is the scientific supervisor of two PhD students with successfully defended dissertations in 2023. Since 2017 he has been a reviewer and member of the Scientific Jury for the defense of dissertations of nine doctoral students in neurosurgery. He is also a member of the Examination Committee for acquiring a specialty in neurosurgery since 2018.


Assoc. Prof. Nakov has realized a teaching activity with post-graduate students amounting to 1195 eq. hours at Acibadem City Clinic University Hospital Tokuda, as well as 559 astronomical hours theoretical and practical training of specialists and post-graduate students at the University Hospital "St. George" for the period 2017-2023. He is a lecturer in a course in surgical treatment of aneurysms at the Military Medical Academy in Sofia and in two courses "UpSurgeOn", in the fields of cranial surgery and glial tumor surgery.

Conclusion:

The personal qualities and the educational and professional development and qualifications as a doctor and neurosurgeon of Assoc. Prof. Vladimir Stefanov Nakov, MD, PhD, his research, publication activity and educational and teaching engagement demonstrate that the candidate fully meets the requirements of the LDASRB and covers and exceeds both the national criteria and the ones set out in the Rules for the Development of the Academic Staff of "Acibadem City Clinic University Hospital Tokuda" Ltd for appointment to the academic position of "Professor".

I give my positive assessment and I call on the members of the Scientific Jury to vote positively for the award to Assoc. Prof. Vladimir Stefanov Nakov, MD, PhD of the academic position "Professor" in the scientific specialty "Neurosurgery" for the needs of the Clinic of Neurosurgery of "Acibadem City Clinic University Hospital Tokuda" Ltd.

27 Mar 2024


Prof. Y. Enchev, MD, PhD

Varna