

REVIEW

by

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Department of Neurosurgery, UMHATEM "N. I. Pirogov"

Concerning: Competition for the academic position "Professor" in the scientific specialty "Neurosurgery" in the field of higher education 7. "Health and Sport" in professional field 7.1. "Medicine" for the needs of the Clinic of Neurosurgery at Acibadem City Clinic University Hospital Tokuda. The competition is announced in the State Gazette No. 98 / Nov 24, 2023. Pursuant to Art. 4, par. 2 and Art. 29A of the LDASRB and Art. 2, par. 2 of the Rules for the Implementation of the LDASRB. The scientific jury was appointed by Order No 15-05-09 / 30.01.2024 of the Executive Director and the Procurator of Acibadem City Clinic UMHAT Tokuda Ltd. on the proposal of the Scientific Council of Acibadem City Clinic UMHAT Tokuda Ltd., approved at a meeting with Protocol No 49 / 01.11.2023.

The only candidate in the competition is Assoc. Prof. Vladimir Stefanov Nakov, MD, PhD.

Presented by Assoc. Prof. Nakov documents comply with the regulatory framework. The deadlines for conducting the competition and the procedure under it are met in accordance with the LDASRB and Regulations for acquiring academic degrees and occupying academic positions at Acibadem City Clinic UMHAT Tokuda Ltd.

I. BRIEF BIOGRAPHICAL SUMMARY AND CAREER DEVELOPMENT

Education & Training:

Assoc. Prof. Vladimir Stefanov Nakov has completed the full course of the Medical Academy - Sofia in the specialty "Medicine" (Diploma No 010570/ 1992). In January 1998 acquires the rights of a specialist in neurosurgery (Diploma No AC 006695 / 10.02.2000). In 2010 he successfully completed a course in professional qualification "Health Management". In 2015 he defended a dissertation on "Results of early surgical treatment of ruptured brain aneurysms" and acquired the educational and scientific degree "Doctor" (Diploma No 83 / 16.03.2015). Assoc. Prof. Nakov has participated in numerous courses and specializations and holds numerous certificates in the field of spinal surgery, cranial microsurgery, surgical treatment of tumors of the skull base and cerebrovascular diseases, etc.

Work experience:

Assoc. Prof. Nakov worked for one year from, 1992 to 1993, as a doctor in Kostenets. From 1993 to 2010 he was a physician at the Clinic of Neurosurgery of the Regional Hospital "Dr. Racho Angelov", Sofia, and University Hospital "St. Anna" - Sofia. From 2010 to 2012 he was a senior physician at the Neurosurgical Clinic of the University Hospital "Sv. Anna" - Sofia. From 2012 to 2016 he was Head of Department at the Clinic of Neurosurgery of the Military Medical Academy, Sofia. Since 2016 he has been working at the Clinic of Neurosurgery of Tokuda University Hospital

as, consecutively, neurosurgeon (2016 - 2017), associate professor at the Clinic of Neurosurgery (2017-2023), and since 02.01.2014 he has been Head of the Clinic of Neurosurgery.

Teaching activities:

Assoc. Prof. Nakov has participated in the management of the specializations of 2 neurosurgical residents. In 2015 at the Military Medical Academy he organized and conducted the first and only ever in Bulgaria live-training course on surgical treatment of brain aneurysms. Assoc. Prof. Nakov has been a lecturer in two sessions of UpSurgeOn, Cadaver Free Training Course: Skull base Surgery (Aneurysmal), July 2022 Sofia and Glioma surgery course, September 2023 Sofia. He was the scientific supervisor of the doctoral studies of 2 successfully defended doctoral students in neurosurgery. Assoc. Prof. Nakov was a reviewer and member of the Scientific Jury for the defense of dissertations of 9 doctoral students in neurosurgery. He was a member of a scientific jury in conducting 2 competitions for acquiring the academic position of Associate Professor. Since 2018 he is a member of the examination committee for acquiring a specialty in neurosurgery and regularly participates in the examination sessions.

Membership:

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

II. SCIENTIFIC OUTPUT

1. *According to the Regulations for the Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria, Appendix for Area 7: Health and Sport, Division 7.1: Medicine, Table 1 - group of indicators "A": dissertation: Assoc. Prof. Nakov has 50 points with 50 points needed.*

ESD "Doctor" - Diploma No 83 / 16.03.2015

Assoc. Prof. Nakov acquired the doctoral degree after defending a dissertation on "Results of early surgical treatment of ruptured brain aneurysms". In his dissertation, the author analyzes the results of surgical treatment of 92 ruptured brain aneurysms, conducted up to 3 days after the hemorrhage in the conditions of an endovascular alternative. Based on a quantitative evaluation of the results, an analysis of the effectiveness and safety of early aneurysmal surgery was performed. The preoperative factors influencing the outcome of the operation were analyzed - brain damage from SAH, localization and morphology of aneurysms, as well as the application of various surgical techniques and techniques to achieve brain relaxation in the conditions of acute SAH, brain retraction and temporary arterial occlusion by formulating specific recommendations for their application. The dissertation also notes the results of surgical correction of complications after aneurysmal coiling, which were made for the first time in the country at that time. It is noteworthy that the dissertation work is built entirely on the own material of Assoc. Prof. Nakov.

2. *According to the Regulations for the Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria, Appendix for Area 7: Health and Sport, Division 7.1: Medicine, Table 1 - group of indicators "B" - Assoc. Nakov has 102.78 points with 100 points needed.*

2.1. Indicators 3:

Assoc. Prof. Nakov did not propose a monograph in the list of scientific production. The author has one monograph that is based on his dissertation and was issued before appointment to the

academic position "Associate Professor", which is why he has not included it in the list of publications.

2.2 Indicator 4:

As the Rules allow indicators 3 and 4 to be interchangeable or to be complementary, instead of monograph Assoc. Prof. Nakov has presented 10 publications in journals that are indexed in world-recognized databases of scientific information. They are published after appointment to the academic position of "Associate Professor". Of these 10 articles, 7 are in journals with impact factor (IF) – Web of Science, 6 are in journals with SCImago Journal Rank (SJR) indicator (Scopus), with three of the journals in which the articles are published possessing both an impact factor and an SGR indicator. Three of the publications (articles 8, 9, 11) are in *Cureus* (IF - 1,2; SJR- 0); two of the publications (articles 5, 7) are in *Surgical Neurology International* (IF - 0; SJR - 0,309-0,256) one article (article 3) in *Folia Medica* (IF - 0; SJR - 0,252); one article (article 4) in *Journal of Neurological surgery Part B: Skull Base* (IF - 1,397; SJR - 0,469); one article (Article 12) in *Neurosonology* (IF - 0.1; SJR - 0); one article (Article 13) in *Acta neurochirurgica* (IF - 2,4; SJR - 0,718); one article (article 14) in *Operative Neurosurgery* (IF - 2,3; SJR - 0,502).

The total impact factor (IF of Web of Science) of the publications of Assoc. Prof. Nakov is 14.03. The h-index for Assoc. Prof. Nakov in Scopus is 3.

The thematic distribution of these articles is varied and is as follows:

- article No. 3 presents a clinical case of advanced intraventricular craniopharyngioma, excised totally by interhemispheric transventricular approach after an unsuccessful attempt to extirpate the tumor through lamina terminalis, and the article demonstrates the possibilities and limitations of both approaches (3);

- article No. 4 is an anatomical study of the possibilities for the application of fully endoscopic translateroorbital approach in operations of lesions of the skull base including cavernous sinus, middle and posterior cranial as well as infratemporal fossa with definition of the boundaries of the operative field provided by this approach, determination of anatomical markers, the conformance to which ensures the safe conduct of approach and demonstration of the advantages of approach over standard approaches, use in neurosurgery in operations of lesions in these areas (4);

- article No. 5 demonstrates an interesting case of an advanced tumor of the carotid body, manifested by intracranial hypertension due to compression of the jugular vein by the tumor, with subsequent venous sinus thrombosis and an increase in intracranial pressure. The authors conducted a two-step treatment by first compensating intracranial hypertension with VP shunt and subsequently performing total tumor excision without prior tumor embolization, and the article presents a detailed description of the microsurgical technique used (5);

- article No. 7 describes a rare case of contrast-induced neurotoxicity manifested with transient cortical blindness after endovascular procedure (7);

- three papers (articles No. 8, 11, 14) are devoted to the use of photogrammetry in neurosurgery, the first of which is a literature review of the use of this method in neurosurgery (11); the second paper presents a 3D anatomical model of the musculature of the back, depicted by photogrammetry (8); and the third article presents 3D anatomical models of cerebral circulation, depicted by photogrammetry and subsequently incorporated into virtual reality (VR), including on mobile devices, which provides innovative perspectives for individual neurosurgical training and self-learning (14);

- article No. 9 is a description of the methodology used by the authors to create 3D printed anatomical models for specific complex cases in craniostenoses and synostoses, for preoperative planning of operations for skull base lesions, for preoperative 3D imaging of aneurysms for the

needs of vascular neurosurgery and for 3D imaging of degenerative or traumatic changes of the spine (9);

- article No12 is dedicated to the concept created by the authors and a specific methodology based on transcranial color-coded duplex sonography for selecting patients to perform extracranial-intracranial bypass surgery in patients with occlusion of a main cerebral artery (12);

- article No. 13 presents the original surgical technique used by the authors in excision of advanced cervical intramedullary hemangioblastoma, demonstrated with authentic intraoperative video and presented in the section "How I do it" in Acta Neurochirurgica (13).

The thematic diversity in the above publications demonstrates the vast experience of Assoc. Prof. Nakov in various fields of neurosurgery and his abilities to successfully deal with complex cases in all stages of surgical treatment: diagnosis and determination of indications for operations (article No 5), including the creation of a concept and a specific methodology for selecting patients for EC-IC bypass (article No 12), preoperative planning and approach selection (articles No 3, 4, 5, 8, 9, 11, 14), conducting the surgical treatment, including demonstration of an original surgical technique (articles No 3, 5, 13), verification and neutralization of unusual complications in neurosurgery (article No 7), correction in case of incorrect choice of surgical approach (article No 3).

3. According to the Regulations for the Implementation of the Law on the Development of Academic Staff in the Republic of Bulgaria, Appendix for Area 7: Health and Sport, Division 7.1: Medicine, Table 1 - group of indicators "G" - Assoc. Prof. Nakov has 206.61 points with 200 points needed.

3.1. Indicator 5:

The provided by Assoc. Prof. Nakov list of scientific publications misses a monograph.

3.2. Indicator 6:

In the provided by Assoc. Prof. Nakov there is no published book based on a defended dissertation for the award of educational and scientific degree "Doctor" or for awarding the scientific degree "Doctor of Sciences".

3.3. Indicator 7:

In list, provided by Assoc. Prof. Nakov there are 4 articles (articles No. 1, 2, 6, 10), published in scientific journals indexed in world-recognized databases of scientific information. These articles provide a total of 60.45 points.

- Article No. 1 is a guide to the use of the freely available OsiriX software for three-dimensional imaging of normal cranial and cerebral anatomy and pathological intracranial structures based on preoperative CT or MRI. Based on its own experience, the capabilities of the software to recreate in three-dimensional terms the planned surgical approach, including the localization and size of the craniotomy and the desired angle for visualization of a pathological process, including its deepest parts, are demonstrated. A "step-by-step" guide to the use of the software has been provided in order both for its optimal use by a wide range of neurosurgeons and for the training of graduate students (1).

- Article No. 2 presents the technical nuances and techniques used by the authors to dissect and clip aneurysms of the vertebro-basilar articulation, which is one of the most inaccessible areas in neurosurgery. The authors support their operative concept with an original intraoperative video and the publication of the article in the section "How I do it" in Acta Neurochirurgica is a recognition of the operative technique used by the authors (2).

- article No. 6 is devoted to modern three-dimensional technologies for generating anatomical three-dimensional images using more than 40 three-dimensional models of layered dissectional anatomy of cervical and cerebral vessels from the anterior cerebral circulation, as well as 3D models based on imaging studies, as each model can optionally be rotated in all planes to be viewed from different visual angles, be increased and decreased and moved in space, which makes these models a very convenient means of studying vascular anatomy (6).

- Article No. 10 is similar to the above article in its essence as the difference is in the presented vessels, namely in this article, unlike the above, it focuses entirely on the different segments of the vertebral artery, which on the basis of own dissections are presented as 3D photorealistic models that can be shared on digital devices and web-based platforms for 3D visualization (10).

3.4. Indicator 8:

In the provided by Assoc. Prof. Nakov list of scientific publications there are presented 13 publications in non-indexed peer-reviewed journals. 12 of these articles were published in Bulgarian neurosurgery and one in Medical magazine. These articles provide a total of 69.56 points.

The articles corresponding to Indicator 8 are focused on several thematic areas:

- Electrophysiological real-time intraoperative neuromonitoring for functional control (Articles No. 15, 24, 26). In article No. 15, the authors focus on some methodological nuances of the application of the method and on many seemingly small details in order to identify areas of suboptimal performance of electrophysiological monitoring with the potential to disrupt the optimal course of surgery. The analysis is based on own material of 147 own operational cases and the authors focus on the technological aspects in the preparation and implementation of neuromonitoring as well as on the impact of positioning and anesthesia on the reliability of neuromonitoring. In article No. 24, the authors present contemporary options for direct stimulation of the primary motor cortex. Analyzing the advantages and disadvantages of bipolar and monopolar stimulation, the authors present the methodology they use for reliable localization of the somatosensory system at reduced risk of intraoperative complications, as well as the methods they use for continuous dynamic monitoring of motor function, which makes possible the quantitative assessment of the functional integrity of the somatomotor system and changes the concept of conducting neurosurgical interventions in the motor cortex. Article No. 26 is devoted to the application of electrophysiological monitoring in operations of deep thalamic and thalamopeduncular lesions in children. Based on a limited series of 4 patients, the authors presented the electrophysiological methods they used to determine the distance from the resection plane to the bundles of the first motor neuron (dynamic subcortical stimulation) and to analyze the functional integrity of the motor system (transcranial stimulation to generate MEP). The combination of these two methods allows the definition of a safe resection limit both by determining the distance from the tip of the surgical instrument to the motor fibers and by the occurrence of changes in MEP in response to surgical trauma in the borderline area (15, 24, 26).

- Surgery of the skull base (Articles Nos. 17, 19, 21, 22, 23). Choosing the right approach is paramount in the surgical removal of tumors engaging or adjacent to the skull base, which explains why three of the articles devoted to approaching the skull base. Article No 17 is an overview of the transpetrous approaches used by the authors - anterior petrosectomy, retrolabyrinthine approach and combined petrosectomy. The indications are defined, and the operative technique used by the authors in these approaches is described in detail. Postoperative results and surgical complications are presented, and the advantages and disadvantages of these approaches are discussed. Article No. 21 presents the evolution of the used antero-lateral approaches to the skull base in the direction of

minimizing the approaches and reducing the surgical trauma while preserving the visualization to the skull base thanks to technological progress both in terms of lighting, optics and mobility of surgical microscopes and exoscopes, as well as in terms of surgical microinstrumentation. Article No. 22 focuses on one particular detail of the anterolateral approach, namely the anterior clinoidectomy, which is described in detail in the way the authors performing it. Articles Nos. 19 and 23 are devoted to extraaxial tumors in the ponto-cerebellar angle. The first of these articles (19) presents the results of the authors from the surgical treatment of advanced vestibular schwannomas in T3 and T4 clinical stages and the authors present the different stages of surgical treatment of these tumors including preoperative planning, meticulous description of the surgical technique used by them and the operative methods to avoid possible complications. The second of these two papers (23) shows the consequences of surgical trauma on the facial nerve in operations on tumors in the ponto-cerebellar angle (schwannomas and meningiomas). Based on the results of the surgical treatment of 38 patients, the authors present the perilous moments of surgery for the facial nerve and the surgical methods to prevent them (17, 19, 21, 22, 23).

- Two articles are devoted to the usefulness of the application of 3D visualization software OziriX or its analogue Horos in preoperative planning based on specific imaging studies. Article No. 16 is a literature review that proves the accuracy and reliability of measurements with 3D visualization software OziriX (Horos) in the preoperative calculation of intracranial lesion coordinates and simulations of various approaches to select the optimal one of them. Paper No. 25 proves the utility of using OziriX (Horos) in planning cranioplasty for calvaria and skull base defects, the method being used by the authors on 13 occasions with a very good result (16, 25).

- Articles No. 18 and 27 present two rare diseases in neurosurgery. In the first paper (18), the authors showed a small series of children operated on due to the presence of a tethered terminal filum with very good postoperative results, and the second article (27) is a case-report describing the successful surgical treatment of a child with calvaria aneurysmal bone cyst (18,27).

- Article No. 20, which I personally would distinguish, demonstrates the possibilities of extracranial-intracranial bypass surgery to compensate for chronic hemodynamic insufficiency of cerebral circulation in patients with occlusion of the main cerebral artery as well as to protect cerebral circulation in operations on giant brain aneurysms (20).

3.5. Indicator 9:

In the list of scientific publications provided by Assoc. Prof. Nakov 12 chapters of the collective monograph "Neurosurgery" with the status of a textbook, issued under the editorship of Corr. Member BAS Prof. N. Gabrovski, MD, PhD, DSc are presented. The participation of Assoc. Prof. Nakov, as a co-author of these 12 chapters, provides him with a total of 76.6 points.

- One chapter (article No. 28) is devoted to the craniometric points and external landmarks used to locate certain anatomical brain structures and correspondingly pathological brain lesions engaging these structures, therefore this chapter is a valuable practical guide in the daily work of neurosurgeons.

- Eight chapters (articles No. 29, 30, 31, 32, 33, 34, 35, 36) present various tumor processes and lesions of the brain and skull base - mucocele, mesenchymal brain tumors, glioma of the optic nerves, hemangiopericytoma, esthesioneuroblastoma, nasopharyngeal carcinoma, fibrous dysplasia, chordomas, in which chapters concisely, but comprehensively, all aspects of etiopathogenesis, classification, diagnosis and treatment of the respective pathologies are presented.

- Three chapters (Articles No. 37, 38, 39) are devoted to brain aneurysms. The first chapter of this series presents contemporary view on the etiology and pathophysiology of brain aneurysms concerning the occurrence, development and rupture of aneurysms. The second chapter (38) is

devoted to the basic principles of surgical treatment of ruptured brain aneurysms as the authors have explained the principles determining the indications for the treatment of bleeding aneurysms, the factors that determine the choice of the type of treatment - endovascular or surgical, after which they have presented in detail the surgical technique for approach, dissection and clipping of aneurysms with an emphasis on possible complications and ways to prevent them. The third chapter (39) presents the principles of treatment of unruptured and giant brain aneurysms.

4. According to the Regulations for the Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria, Appendix for Area 7: Health and Sport, Direction 7.1: Medicine, Table 1 - group of indicators "D" - Assoc. Prof. Nakov has 570 points with 100 points needed.

According to a report prepared by NACID, journals publications of Assoc. Prof. Nakov are cited 32 times in journals indexed in international databases of scientific information (Indicator 10) and 18 times in non-indexed peer-reviewed journal publications (Indicator 12), with a total sum of points by group of indicators "D" being 570.

The citations of the publications are in the following journals in the field of neurosurgery 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 of 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).

5. According to the Regulations for the Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria, Appendix for Area 7: Health and Sport, Direction 7.1: Medicine, Table 1 - Group of Indicators "D" - Assoc. Prof. Nakov has 200 points with 100 points needed.

5.1. Assoc. Prof. Nakov was the supervisor of two successfully defended PhD students:

- Milko Milev, MD, PhD, defended a dissertation on "Multimodal intraoperative electrophysiological neuromonitoring in neurosurgical surgical interventions" - January 2023
- Lili Laleva, MD, PhD, defended a dissertation on "Minimally invasive extended orbital approach in intraorbital and intracranial pathology" - January 2023

5.2. Indicator 16:

Assoc. Prof. Nakov is a participant in two national scientific projects funded by the National Science Fund at Sofia University "St. Kliment Ohridski" with funds allocated from the state budget:

- "Neurovascular layer anatomy of the suboccipital fossa in revascularization of posterior cerebral circulation and their conversion into 3D models" (Contract No 80-10-192 / 27.05.2022);
- "Training of students in anatomy with three-dimensional photorealistic dissectional models presented through virtual and augmented reality" (Contract No 80-10-182 / 17.05.2023).

5.3 Indicator 17:

Assoc. Prof. Nakov is a participant in an international scientific project "Three-Dimensional Photorealistic Atlas of Neurological Surgery" 2022, funded by the Research Fund of the European Association of Neurosurgical Societies (EANS) after winning an announced competition by EANS.

The project involves representatives of the Clinic of Neurosurgery at the University Hospital in Tokuda, the Department of Anatomy and Histology, Pathology and Forensic Medicine at the Medical Faculty of Sofia University, the Clinic of Neurosurgery and the Department of Anatomy, University Hospital Düsseldorf, Heinrich Heine University, Germany, Clinic of Neurosurgery and Department of Anatomy, University of Copenhagen Denmark, Laboratory of Neuroanatomy Idris, Salerno, Italy.

5.4. Indicator 22:

Assoc Prof. Nakov has actively participated in the training of interns and residents, for which he has presented certificates from the Clinic of Neurosurgery of the University Hospital "St. Georgi" Plovdiv (Certificate No 256 / 15.01.2024) and from the Training Department of Acibadem City Clinic UMHAT Tokuda (Certificate No 19-665 / 04.12.2023).

III. SCIENTIFIC CONTRIBUTIONS

According to the presented publications the scientific contributions of Assoc. Prof. Nakov are in the following areas:

1. Cerebrovascular surgery

1.1. Systematization of knowledge about the etiology, pathogenesis and natural biological behavior of brain aneurysms. Presentation of a comprehensive concept for behavior in patients with ruptured brain aneurysms, including diagnostics, choice of method and timing for aneurysmal obliteration, based on the influence of various objective and subjective factors on the outcome of treatment, detailed description of the surgical technique for dissection and clipping of aneurysms, description of possible surgical complications and presentation of methods and surgical techniques for their prevention and neutralization, including the implementation for the first time in the country of surgical techniques to compensate complications of endovascular treatment of brain aneurysms. On this topic are dedicated publications No. 2, 7, 37, 38, 39, as well as the dissertation of Assoc. Prof. Nakov.

1.2. Establishing extra-intracranial arterial bypass surgery as a protective agent in the treatment of giant cerebral aneurysms and as a means of treating hemodynamic cerebrovascular insufficiency in patients with major artery occlusion, including the implementation of an original methodology for determining bypass-appropriate patients based on color-coded duplex transcranial sonography. Publications No. 12, 20, 39 are devoted to this topic.

2. Surgery of the skull base

2.1. Detailed description of approaches to the skull base: presentation of anterolateral approach to the skull base, including anatomical study for fully endoscopic execution of approach (Articles No. 4, 21, 22) and description based on specific anatomical markers of the different types of transpetrous approaches with rules for selecting the correct approach and for its accurate execution (article No. 17).

2.2. Establishment of electrophysiological intraoperative monitoring as the only reliable objective intraoperative indicator for protection the function of the cranial nerves during resection of advanced tumors of the ponto-cerebellar angle (Articles Nos. 19, 23).

3. Intraoperative real-time functional physiological control

3.1. Systematization of the possible cause of suboptimal implementation of intraoperative electrophysiological neuromonitoring and proposing specific solutions for their appropriate correction in order to preserve the reliability and security of the method (article No 15).

3.2. Presentation of the results of the application of intraoperative electrophysiological neuromonitoring in operations of tumors engaging the diencephalic area (article no. 26).

3.3. Analysis of methods for intraoperative electrophysiological direct identification of primary cerebral cortex and of the results of cortical stimulations in operations on supratentorial lesions (article no. 24).

4. Three-dimensional visualization of normal anatomical structures and pathological processes in neurosurgery

4.1. Implementation in daily surgical practice of preoperative planning of surgical approaches based on 3D visualization of individual patient preoperative images and superposition of 3D images on the patient during surgery.

4.2. Individualized 3D printing of cranium in patients with lesions of the cranial roof or skull base as part of preoperative planning.

4.2. Photorealistic 3D scanning of anatomical models and various neurosurgical surgical interventions to train students and post-graduate students through the project www.3Ddataofneurologicalsurgery.org

IV. TEACHING ACTIVITIES

1. Assoc. Prof. Nakov has presented certificates for activities in the total amount of 1754 hours - 1195 equivalent hours at the "Acibadem City Clinic UMHAT Tokuda" Ltd and 559 hours at the University Hospital "St. Georgi" Plovdiv.

2. Assoc. Prof. Nakov has been a lecturer in two sessions of UpSurgeOn, Cadaver Free Training Course: Skull Base Surgery (Aneurismal), July 2022, Sofia, Bulgaria and Glioma Surgery Course, September 2023, Sofia Bulgaria, for which he has presented certificates from the course organizers.

3. Assoc. Prof. Nakov was the scientific supervisor of the doctoral studies of two successfully defended PhD students:

- "Multimodal intraoperative electrophysiological neuromonitoring in neurosurgical interventions" - Milko Milev MD, PhD, January 2023

- "Minimally invasive extended lateral orbital approach in intraorbital and intracranial pathology" - Lili Laleva, MD, PhD, January 2023

4. During the period 2018 - 2023 Assoc. Prof. Nakov has repeatedly participated in examination committees in exams for acquisition of a specialty in neurosurgery.

5. During the period 2017 - 2023 Assoc. Prof. Nakov was a reviewer and member of the Scientific Jury for the defense of nine PhD students in neurosurgery.

V. TREATMENT AND DIAGNOSTIC ACTIVITIES

As is evident from the publications of Assoc. Prof. Nakov, which are based entirely on personal clinical material, his practical activity is focused on the diagnosis and treatment of brain aneurysms, tumors of the skull base and ponto-cerebellar angle, extraaxial brain tumors. These areas of neurosurgery require detailed anatomical knowledge, complex neurosurgical training, precise surgical technique and, above all, the construction of a synchronized team. In addition to being an accomplished neurosurgeon with proven achievements, Assoc. Prof. Nakov is the head of a sustainable and progressive team whose existence is based on individual subspecialization and complementarity and trust, which allows for performing the most complex neurosurgical surgical interventions at controlled risk and with good results.

VI. CONCLUSION

The documents and materials presented demonstrate, that the scientific, educational and teaching engagement and diagnostic and therapeutic workload of Assoc. Prof. Nakov satisfy in quantitative and qualitative aspect the requirements of the LDASRB to apply for the academic position of "professor". I am therefore voting in favour of awarding to Assoc. Prof. Nakov the academic title "professor" and I call on the other members of the jury to vote in the same way.

Mar 20, 2024

Reviewer:

/Corr. member. Prof. Dr. Nikolay Gabrovski, MD, PhD, DSc/