

## Summary of the Habilitation Thesis

The thesis titled "Neurosurgery between Surgical Practice, Innovative Technology, and Multidisciplinary Approach" is structured into four parts. The first part refers to the scientific activity through which the candidate establishes their legitimacy with outstanding results across multiple research levels. The first is dedicated to vertebro-medullary pathology, a topic studied over the course of 10 years and materialized in the doctoral thesis titled "The Value of Various Imaging Modalities in the Diagnosis of Vertebro-Medullary Tumors."

The interest in this research area was subsequently materialized through other cases presented at various scientific events and published in prestigious ISI journals such as World Neurosurgery. Since military medicine has a specific character, including field medicine, it seems natural that translational neurosurgery in trauma and polytrauma constitutes a research topic in itself. Severe cases of craniocerebral trauma presented demonstrate the necessity of multidisciplinary teams, as well as the role of innovative technologies in ensuring complete and correct medical care that restores patients' quality of life.

The collaboration of the team of neurosurgeons, imagists, plastic surgeons, and engineers from the Polytechnic University of Bucharest led not only to saving lives but also to patents, such as the one obtained for the cranial endoprosthesis with a sliding system, which received seven international awards.

A subchapter of the scientific activity refers to fields related to neurosurgery, with several papers published in ISI journals with impact factors, such as Journal of Clinical Medicine (Q2), Bioengineering, Healthcare, Brain Sciences, American Journal of Therapeutics (Q2), Diagnostics (Q2), Experimental and Therapeutic Medicine, Romanian Journal of Military Medicine, etc. Some of the topics addressed here refer to normal-pressure hydrocephalus (NPH), the seasonal incidence of cerebral hemorrhages and other associated risk factors and the role of imaging in evacuating cerebral hemorrhages through minimally invasive techniques.

Remaining in the same field of cerebrovascular accidents, we studied *stroke-heart syndrome* (SHS), an underdiagnosed condition that includes several cardiac complications occurring after an ischemic stroke. Multinodular vacuolating neuronal tumors (MVNT) are very rare, and since they pose diagnostic challenges, we studied the cases published so far and attempted to present their clinical, imaging, and immunohistochemical characteristics.

The synthesis of these studies, reflected on Web of Science accessed on December 27, 2024, shows a number of **22 publications**, an **Hirsch index of 6**, and **66 citations**. Another subchapter refers to publishing activity, which also includes the publication of specialty books as a co-author or coordinator, as well as chapters in medical treatises that have enjoyed real success.

From the subchapter dedicated to scientific events, we note participation in the scientific committees of the Conferences of the Central Military Emergency University Hospital, Bucharest, the organization and coordination of the conference "Neuroteam - Neurosciences at the Intersection of Medical and Surgical Specialties," held in 2022, being a panelist at the National Neurology Forum, Neuro-oncology Section, 2023, and many others. Activity on the editorial board of the Romanian Military Medical Journal, started in 2021, continues to this day.

The second part addresses academic activity, focusing on the academic trajectory starting as a lecturer in 2021 and the main academic responsibilities reviewed up to today. In addition, administrative and managerial tasks are described, with their specific degrees of complexity, considering the specificities of military medicine and the neurosurgical specialty.

The third part focuses on professional activity. The professional trajectory from graduating UMFCU with a grade average of 9.80 to the current position as discipline chief, clinical section head, and residency coordinator is detailed here.

The last part, dedicated to the career development and evolution plan, is structured around teaching activities with students and residents and research activities. In addition to the continuous improvement of teaching and mentoring activities, starting from new paradigms and exchanges within ERASMUS+ mobility programs, which are detailed herein, some potential research topics are also mentioned (modern, non-invasive, and safe performance techniques for the early identification of risk and progression markers for brain tumors; personalizing medicine to tailor therapies to the patient, increasing their effectiveness and limiting toxicity based on individual profiles; developing "smart" materials – nanostructures, smart gels, nanomaterials, biosensors – biocompatible, efficient, and safe in collaboration with teams from UPB; innovative approaches to reducing the risk of infections with a tropism for the nervous system, etc.).

The thesis concludes with a SWOT analysis, allowing for a realistic positioning concerning the proposed objectives.