

**TITU MAIORESCU UNIVERSITY OF BUCHAREST
DOCTORAL SCHOOL OF MEDICINE**



HABILITATION THESIS SUMMARY

**CONTRIBUTIONS TO THE ADVANCEMENT OF MODERN
PHYSICAL AND REHABILITATION MEDICINE THROUGH
INNOVATIVE TECHNOLOGIES AND MULTIMODAL
INTERVENTIONS**

CANDIDATE:

Dr. Tache-Codreanu Diana-Lidia

Associate Professor, MD, PhD

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My scientific research activity represents a fundamental component of my professional and academic career, being closely connected to clinical practice and teaching. Continuing the research direction initiated during my doctoral studies, completed in 2015 with the PhD thesis entitled “Rehabilitation Programs for Motor Deficits Caused by Lumbosacral Discogenic Disorders”, my work has focused on the development, evaluation, and optimization of modern rehabilitation strategies in Physical and Rehabilitation Medicine. The main research directions include orthopedic, neurological, respiratory, and postoperative rehabilitation, with emphasis on innovative physical agents, multimodal therapeutic protocols, respiratory recovery after COVID-19 and lung transplantation, and integrative approaches involving art therapy, nutrition, and functional recovery. The results of these activities have been disseminated through ISI-indexed publications, articles indexed in international databases, specialized books, and scientific conferences and events, contributing to the consolidation of a coherent academic and scientific profile in rehabilitation medicine.

The habilitation thesis intitled “CONTRIBUTIONS TO THE ADVANCEMENT OF MODERN PHYSICAL AND REHABILITATION MEDICINE THROUGH INNOVATIVE TECHNOLOGIES AND MULTIMODAL INTERVENTIONS” is structured into four main chapters, preceded by abstracts in English and Romanian and by a table of contents, and followed by a bibliography including references used in the preparation of the thesis, as well as the publications to which I have made a personal contribution in the selected field.

The first chapter, **Scientific Activity**, presents my research activity organized into three major research directions. Each direction is structured according to the conventional scientific framework, including introduction, materials and methods, results and discussion, and conclusions.

The first research direction focuses on the integration of innovative physical therapies and personalized multimodal rehabilitation protocols in Physical and Rehabilitation Medicine, with the aim of improving functionality, accelerating recovery, and reducing disability. The studies included in this direction evaluated modern therapeutic technologies such as high-intensity laser therapy, radial extracorporeal shock wave therapy, functional electrical stimulation, and vacuum-compression therapy, as well as complex rehabilitation protocols applied in musculoskeletal, neurological, and postoperative conditions. Overall, this research direction supports the clinical value of modern physical agents and evidence-based multimodal protocols adapted to patients’ functional needs.

The second research direction focuses on modern respiratory rehabilitation as a multidimensional process that integrates functional, metabolic, psychological, and behavioral components. The studies included in this direction addressed two major clinical contexts: rehabilitation after lung transplantation performed in Romania and rehabilitation of patients with post-COVID syndrome, both conducted within Colentina Clinical Hospital, Bucharest. The research evaluated personalized and multidisciplinary rehabilitation programs, using objective tools for monitoring functional capacity, exercise tolerance, and recovery progression, while also considering the psycho-emotional impact of respiratory impairment.

The third research direction addresses integrative perspectives in functional rehabilitation, emphasizing the transition from conventional physical therapy-centred approaches toward multidimensional and personalized models of recovery. The studies included in this direction explore the complementary role of art therapy, nutritional interventions, and other integrative strategies in addressing not only the biological aspects of disease, but also the psychological, social, and functional dimensions of rehabilitation.

Particular attention is given to creative therapeutic interventions in psycho-emotional recovery, targeted nutrition and supplementation in supporting functional performance and tissue regeneration, food safety and interdisciplinary approaches relevant to chronic conditions and disability.

Following the presentation of these research directions, the thesis reviews the ISI-indexed publications in chronological order, emphasizing their scientific relevance and their contribution to the development of the three main research directions. This section also includes the specialized books published as a result of the conducted research, articles published in international databases presenting also, studies focused on new techniques, protocols, and physical agents used in rehabilitation medicine. In addition, the thesis presents the dissemination of scientific results through conferences and peer-review activities carried out for scientific journals ISI-indexed.

The second chapter is dedicated to **Academic and Teaching Activity**. It presents my academic path, teaching responsibilities, teaching materials developed, and student mentoring activities. Although my professional experience in higher education is relatively recent, covering only one academic year, it has played an essential role in my development as both a teacher and a researcher. It has provided me with the opportunity to interact directly with students and to actively contribute to the development of their professional competencies in the field of medical rehabilitation.

The third chapter presents my **Professional Activity**, describing my medical career from the first stages of professional practice, including my initial activity as a general practitioner, through the successive stages of postgraduate training, specialization, and professional development in Physical Medicine and Rehabilitation. This chapter also highlights the multiple training courses, internships, complementary certifications, and competencies that have contributed to my professional profile in rehabilitation medicine. Particular attention is given to my medical management activity as Head of the Department of Rehabilitation, Physical Medicine and Balneology at Colentina Clinical Hospital, Bucharest.

The final chapter, **Academic Career Development Plans and Future Perspectives**, outlines the main objectives for the next stage of my academic career after obtaining the habilitation certificate. In this stage, I aim to consolidate and further expand my teaching, research, and institutional activities, with the purpose of strengthening my expertise in Physical and Rehabilitation Medicine and contributing to the education of future generations of medical professionals and researchers. My academic development will be based on the integration of clinical experience, scientific research, student-centred teaching, interdisciplinary collaboration, and institutional involvement. Overall, this habilitation thesis reflects the integration of clinical expertise, scientific research, academic teaching, and professional leadership in the field of Physical and Rehabilitation Medicine.