

„VASILE GOLDIȘ” WESTERN UNIVERSITY of ARAD

**MULTIDISCIPLINARY DOCTORAL SCHOOL
MEDICINE DOMAIN**



UNIVERSITATEA DE VEST
“VASILE GOLDIȘ”
din ARAD

**INTERDISCIPLINARY RESEARCH IN
CARDIOVASCULAR PATHOLOGY, PATHOLOGY
GENERATED BY SARS-CoV-2 VIRUS INFECTION AND
PROFESSION RELATED PATHOLOGY**

ABSTRACT

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The habilitation thesis entitled "Interdisciplinary research in cardiovascular pathology, pathology generated by SARS-CoV-2 virus infection and profession related pathology " contains the author's most important achievements, after obtaining the title of Doctor of Medicine in 2001, with the thesis "Research on cardiovascular functional capacity and effort capacity of active professional hypertensives", under the coordination of Professor Streian Caius.

The habilitation thesis is structured in 3 large sections:

- The first section comprises personal scientific achievements.
- The second section includes plans and prospects for professional, scientific and academic career development.
- The third part contains references used for the aforementioned research and documentation work.

Given the interdisciplinary nature of Occupational Health and the interdisciplinary research during the predoctoral period, I had the opportunity to be part of several national and international research teams:

- ERS CoPD Audit 2011 – Junior Investigator in a European project.
- Clinical Impact of the HOMA Index in Establishing the Early Risk of Preeclampsia in Pregnant Women, Internal Research Project 2014-2016, Project Member
- CA COST Action CA 15129 – Diagnosis, Monitoring and Prevention of Exposure – Related Noncommunicable Diseases – DiMoPex- International competition, Management Committee member 2016-2020, on behalf of UVVG Arad
- EXIMIOUS project – "Mapping Exposure- Induced Immune Effects: Connecting the Exposome and the Immunome"- 2020 – 2024, scientific researcher WP2.
- Cancer Prevention at Work (CPW): Occupational health surveillance in the implementation of prevention of infection-related cancer, 2023-2024 scientific researcher WP2.

This research has contributed to broadening the medical horizon, being published in 17 articles in ISI-rated journals, as well as 11 articles indexed in national and international databases, as well as 16 oral presentations delivered at national and international conferences.

According to the Web of Science, the attained Hirsch index is 6, with a total of 98 citations.

The current thesis highlights the author's main scientific achievements, presenting the results of the most important studies.

The first section, dedicated to scientific achievements, is structured as follows:

- Interdisciplinary research on cardiovascular pathology,
- Research on the pathology and complications generated by SARS-CoV-2 virus infection
- Research on profession-related pathology.

Cardiovascular pathology is an issue of great concern due to the fact that cardiovascular diseases rank first in the Table of Profession Related Diseases, being triggered or aggravated by working conditions.

We have addressed some of the most frequent and serious cardiovascular diseases with a major impact on patients' quality of life and their work capacity. These conditions are cardiomyopathies, atrial fibrillation and ischemic heart disease.

Atrial fibrillation is considered to be the most frequent arrhythmia, and can lead to severe neurological impairment or death due to stroke.

Genetical factors, hypertension, thyroid disease, valvular disease, alcohol intake, strenuous exercise, as well as smoking are all factors frequently associated with the onset of atrial fibrillation in younger patients, highlighting its multifactorial etiology. It is paramount to identify such comorbidities in early stages in order to prevent possible complications. Based on our study's results, we can statistically conclude that permanent atrial fibrillation is more harmful than paroxysmal atrial fibrillation, ischemic stroke and dementia being more frequent in those with permanent atrial fibrillation. However, we consider paroxysmal atrial fibrillation is a more serious condition due to the higher prevalence of young patients. Heart rate control is essential in managing atrial fibrillation. It is necessary to implement public awareness programs in order to educate the general population regarding the signs and symptoms of cerebral hypoperfusion that can lead to stroke, for an optimal emergency management of such cases, as to reduce stroke-related mortality and disability rates.

The second direction of research, that of the pathology and complications generated by SARS-CoV-2 virus infection, is the result of a unique experience, given the fact that between 2020 and 2022 I led the Occupational Health Clinical Department, which was designated a Covid support department by Order of the Minister of Health, actively participating in the treatment of Covid-positive patients.

Studies carried out during the pandemic and post-pandemic periods have shown that SARS-CoV-2 infection can cause multi-organ damage, the most feared complications studied being cardiovascular complications (rhythm disorders and cardiomyopathies).

Asymptomatic as well as symptomatic cases can lead to complications such as arrhythmias or systolic dysfunction with an impact on life quality.

The third direction of research refers to the diseases generated or aggravated by pollutants found in the workplace environment: physical fumes (inorganic and organic dusts), chemical fumes (organic solvents, welding gases, pesticides).

The occupational pollutants mentioned above can generate occupational diseases or diseases related to the profession as well as neoplastic diseases.

The second section of the thesis – career development plans and prospects is structured as follows: professional, scientific and academic development.

Professional career

My concerns regarding the legislative aspects of the profession have materialized over time in numerous legislative initiatives within the Occupational Health Commission of the Ministry of Health, within the Interministerial Working Group (Ministry of Health, Ministry of Labor), a group of which I am a member, as well as initiatives on my own by submitting proposals to the parliamentarians of Arad.

As a occupational medicine physician, internal medicine specialist, head of the Occupational Health Clinical Department and president of the Occupational Health Commission of the Ministry of Health, I will continue to advocate for the development of the Occupational Health specialty as an interdisciplinary clinical specialty, with roles in prevention, diagnosis and treatment of diseases generated or aggravated by working conditions.

I will propose and continue to support the amendment and improvement of the legislation regulating the specialty.

Scientific career

On a scientific level, I want to continue the 3 aforementioned research directions.

The main area of research I pursue relates professional diseases, in particular cardiovascular diseases as diseases related to the profession (Hypertension in relation to work overloads).

Currently, the main area of scientific interest is represented by the pathology of welders. A study is currently underway on subjects with significant welding exposure and who, in addition to fibrosis or siderosis, also have cardiovascular diseases, namely ischemic heart disease and hypertension, both on the first places in the Table of profession related diseases.

I will continue my scientific career by collaborating and activating in multidisciplinary research teams, including occupational health, internal medicine, cardiology, physiotherapeutic recovery specialists as well as researchers from the Institute of Life Sciences of the „Vasile Goldiș” West University of Arad.

Academic career

Academically, I have the following objectives:

- Pursuing international and especially European trends regarding teaching and research;

- Orienting the student-centered teaching and learning activities, the use of active-participatory strategies, the application of academic group management, the diversification of evaluation techniques with a focus on student performance and skills;
- Student involvement in the teaching-learning process, solving problematic situations, simulations, microgroup activities and research projects;
- Involving students in the scientific research process and encouraging participation in international scientific events.

I will propose optional postgraduate courses, scientific circles, workshops as well as a master's degree in the field of occupational health that will provide in-depth knowledge.

Through these achievements, gained experience, and the materialization of future projects, I want to contribute to the academic activity of the „Vasile Goldiș” West University of Arad and to strengthen the prestige of the institution.

The reference list is the last chapter of the present thesis and encompasses 366 titles significant for documenting and researching the aforementioned subjects.