

S T A N D P O I N T

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**on the dissertation for awarding the educational and scientific title of
"Doctor of Philosophy":**

**"ROLE OF CT AND MR ENTEROCOLONOGRAPHY FOR
DIAGNOSIS AND FOLLOW-UP IN CROHN'S DISEASE"**

Thesis by

Dr. Svetomir Sevdalinov Chakarov

Doctoral student in the Scientific Specialty "Medical Radiology and Roentgenology
(Including Use of Radioactive Isotopes)",
Professional Heading "Medicine" (7.1)

By written order of the Rector № 109-169 / 28.02.2023 I have been appointed as an Internal Member of the Scientific Jury judging on the aforementioned thesis. In accordance with protocol № 1 / 09.03.2023 of the conducted first session of the Scientific Jury I have been appointed to formulate a standpoint.

I. BRIEF BIOGRAPHIC DATA AND CAREER DEVELOPMENT

Dr. Svetomir Sevdalinov Chakarov is born on the 19.08.1986 in Kirkovo, Kardzhali district. In 2011 he graduates his education in Medicine at Medical University "Prof. Dr. Paraskev Stoyanov" Varna.

He works at the Diagnostic Imaging department of MHAT “Dr. Atanas Dafovski” Kardzhali as a medical doctor from 10.2011 to 10.2012. From 2012 he is appointed as medical doctor at the Clinic of Diagnostic Imaging, Interventional Radiology and Radiotherapy at UMHAT “Sveta Marina” Varna.

From 2013 to 2017 he is a resident at the Clinic of Diagnostic Imaging, Interventional Radiology and Radiotherapy at UMHAT “Sveta Marina” Varna. In December 2017 he acquires the “Diagnostic Imaging” specialty.

From September 2021 Dr. Svetomir Chakarov is appointed as a teaching assistant at the Varna Medical College.

The doctoral student is fluent in English and Russian.

Dr. Chakarov has interests in: diagnostic imaging of the gastrointestinal tract and abdomen; non-vascular interventional radiology; diagnostic imaging of the breast. The doctoral student is part of the reference expert team on HRCT of pulmonary interstitial disease of the Clinic of Diagnostic Imaging at UMHAT “Saint Marina” Varna.

He is a member of the Bulgarian Association of Radiology, of the Bulgarian Medical Association, and the European Society of Radiology.

II. RELEVANCE OF THE DISSERTATION’S TOPIC

The doctoral student presents a relevant topic of substantial importance for the patients and the medical community – Crohn’s disease is an inflammatory condition of the gastrointestinal tract. It has a chronic-recurrent nature, with periods of remission and exacerbation. It can affect the entire span from the mouth to the anus with predilection to the terminal ileum. The frequency of the disease worldwide is 50 out of every 100 000 individuals. Primarily young patients are affected, between 20 and 40 years of age. The chronic-recurrent and destructive nature of the disease can lead to temporary or permanent disruption of the patient’s normal physical activity and work capacity, as well as to potentially necessitating microinvasive or open surgical interventions. Because of this Crohn’s disease is considered a socially significant condition.

Determining the initial diagnosis is relatively easy using the diagnostic imaging methods, described by the doctoral student. Due to the recurrent character of Crohn's disease diagnostic imaging is also crucial in the long-term follow-up of the patients.

Dr. Svetomir Chakarov also notes the association between the imaging-based activity and severity score – Leman index, and the quality of life of the patients (IBDQ). The doctoral student also correlates the imaging findings with paraclinical and laboratory examinations, broadening the scope of his research beyond the narrow focus of the radiologist, and presenting data of multidisciplinary importance.

III. STRUCTURE OF THE DISSERTATION

Dr. Chakarov's work encompasses 142 pages, from which: Introduction – 2 pages, Literature Review – 48 pages, Aim and Tasks – 1 page, Material and Study Organization – 11 pages, Results and Discussion – 40 pages, Conclusion – 3 page, Inferences – 1 page, Contributions – 1 page, Publications, Associated with the Dissertation – 1 pages, Addendums – 8 pages, Bibliography – 10 pages.

The dissertation is richly illustrated with 49 figures and 9 tables.

The writing style is professional, the structure – classic.

IV. CHAPTER BY CHAPTER ANALYSIS OF THE DISSERTATION

Literature review: The review of literature is comprehensive (48 pages), with excellent structure. The reader is introduced into the topic with data on the nature, epidemiology, and different risk and protective factors for Crohn's disease. This is followed up by the various means of serological and histological diagnostics. Dr. Chakarov describes the imaging means of diagnosing the condition, detailing each modality used, as well as accenting the most informative and relevant ones – CTE and MRE.

The review cites 190 sources, of which 3 in Bulgarian and 187 in English. Among them 29 are from the last 5 years (5 from 2022, 2 from 2021, 3 from 2020, 11 from 2019, 8 from 2018). In view of this I determine that the presented selection of sources is sufficiently up to

date. Additionally, the large number of articles cited demonstrates the doctoral student's broad and detailed thematic knowledge.

Aim of the Study and Tasks: The doctoral student aims to “to investigate changes in CTE and MRE in Crohn's disease and to determine their role in the diagnosis and follow-up of the disease”. The goal is ambitious and multi-staged.

In order to achieve the aim Dr. Chakarov formulates a total of 6 tasks with varying degrees of difficulty and clinical relevancy. Of greatest importance for the clinician one would classify tasks 3, 4, and 5, relating to quality of life and the correlation between imaging, clinical, and paraclinical findings. Tasks 1 and 2 are primarily of interest to the specialists in diagnostic imaging, while task 6 is aimed at the radiological technologists and optimizing the imaging protocols for these patients.

Material and Study Organization: The work presents a combined retro- and prospective study, utilizing already available clinical, laboratory, and imaging data, as well as acquiring the same types of data in the follow-up process of patients with histologically-proven Crohn's disease.

Over a period of five years (2017 – 2022) 194 patients suffering from Crohn's disease have been examined. Said patients have cumulatively undergone 446 imaging studies – 386 CT and 60 MR enterocolonographies. Due to the chronic-recurrent nature of the condition, the patients have been hospitalized more than once at UMHAT “Saint Marina” Varna. The doctoral student takes into account only those hospital stays during which the patients have undergone CTE or MRE.

The author details the utilized technical tools, imaging protocols, as well as the types of analyzed imaging, clinical and laboratory data. Special attention is given to the custom CT and MR imaging protocol for patients with Crohn's – also separately noted in the addendums. A concise and accessible recapitulation of the used statistical methods is provided.

Results and Discussion: The results are diligently ordered and presented, separated by tasks, and supported with corresponding graphics and tables.

Dr. Svetomir Chakarov compares his own results with those from analogous reference international studies, reaching a similar distribution of findings. I consider this as an indication of the high quality of the doctoral student's work – both in recognizing the findings and in analyzing the results.

Conclusion: In the conclusive discussion the candidate notes the substantial importance of CTE and MRE in diagnosing and following up Crohn's disease. He stipulates the multitude of imaging findings, as well as the correlation between the measured activity indexes and the worsening quality of life of the patients. A tendency of disease progression is noted in the majority of patients. The author reports a correlation between a rise in Leman index and an increased likelihood of progression – a finding of significance.

Inferences: Nine inferences are presented – they are ascertained based purely on the results of the statistical analysis.

Contributions: The doctoral student points out 12 contributions, separated into three categories. I concur with the author's defined contributions.

V. PUBLICATIONS, ASSOCIATED WITH THE DISSERTATION

Dr. Svetomir Sevdalinov Chakarov presents the following scientific publications, associated with the dissertation:

- Full text publications in referred and indexed journals – 1 items
- Full text publications in non-referred peer-reviewed journals – 2 items

The topic of the dissertation is fundamental in the aforementioned publications. They are assiduously written, illustrated, and cite a wide range of sources, which should be interpreted as an indicator for the high quality of the doctoral student's works.

The doctoral student presents a Thesis Summary in Bulgarian comprising 67 pages, which sufficiently well presents the results of the dissertation. The Thesis Summary is also available in English.

The aforementioned materials completely satisfy and exceed the scientific metric criteria for the acquisition of the title of "Doctor of Philosophy" in Medicine.

Dr. Svetomir Sevdalinov Chakarov has active scientific profiles in *Google Scholar* and *ORCID*.

The candidate has participated in national scientific forums.

The works of Dr. Svetomir Sevdalinov Chakarov possess scientific, theoretical, and practical significance. They encompass cutting-edge topics in abdominal diagnostic imaging. A special accent on Crohn's disease and optimizing the imaging protocols for its diagnosis is evident. The publications are comprehensive, well-structured and illustrated – they demonstrate the highly specialized knowledge and expertise of the doctoral student in the field of gastrointestinal diagnostic imaging.

VI. CONCLUSION

The dissertation “Role of CT and MR Enterocolonography for Diagnosis and Follow-Up in Crohn's Disease” is an exhaustive study with substantial clinical value. The topic is current and of great significance, pertaining to the socially significant condition Crohn's disease, which is in need of accurate diagnosis and long-term follow-up through the methods of diagnostic imaging. The conducted study is excellently structured and executed, the results are comprehensive and of high quality. I deem that the doctoral student demonstrates the ability for assiduous and competent work with scientific information and data, as well as the capacity to formulate a scientific thesis and defend it with evidence. The work satisfies the requirements of the Law for the Development of Academic Staff in the Republic of Bulgaria, as well as those of the Rules for the Development of Academic Staff of MU “Prof. Dr. Paraskev Stoyanov” Varna, legitimizing the author as a reliable researcher.

I confidently express my **positive** assessment of Dr. Svetomir Sevdalinov Chakarov. I propose to the honorable members of the Scientific Jury that they also **vote in favor** of Dr. Svetomir Chakarov being awarded the educational and scientific title of “Doctor of Philosophy” in the higher education field of “Medical Radiology and Roentgenology (Including Use of Radioactive Isotopes)”, Professional Heading “Medicine” (7.1).

10.04.2023

Varna

Regards,

Assoc. Prof. Georgi Nikolaev Valchev, MD, PhD