To the Chairman of the Scientific Jury,

determined by Order No. P-109-408/ 28.09.2023

of the Rector of the Medical University - Varna

On Your Protocol No. 1/ of 29.09.2023

DISSERTATION REVIEW

from

Prof. Dr. Nikolay Kolev, MD

University of Medicine - Pleven

UMBAL "Dr. Georgi Stranski" EAD,

Clinic of urology, Pleven

On the dissertation work of Dr. Doichin Gergiev Nikolov, on the topic:

"Challenges for hospital urology practice in the context of the COVID-19 pandemic"

for the awarding of a scientific educational degree "Doctor"

The dissertation work for obtaining the scientific educational degree "Doctor" on the topic "Challenges for hospital urological practice in the conditions of the

COVID-19 pandemic" developed by Dr. Doichin Nikolov is a different topic for urology, a result of the COVID epidemic and the imposed changes in the hospital wards.During the period of the epidemic, radical changes in the admission and structure of urological patients were required.

The presented scientific work contains 126 pages and is illustrated with 40 figures and 25 tables. The bibliography includes 190 titles, of which 16 are in Cyrillic and 174 are in English. The 3 publications related to the dissertation work are presented.

The structure of the dissertation corresponds to modern requirements and contains all the necessary sections.

The literature review is detailed in content and, in a volume of 39 pages, informs us about the nature and specificity of the COVID-19 epidemic. It faced medical facilities and medical professionals with extremely complex situations related to the treatment of patients with COVID-19, and at the same time continuing to work with patients with other diseases. Consideration of the impact of COVID-19 on urology practice and changes to admission and treatment protocols are central to maintaining quality of care and patient safety in urology clinics.

Dr. Nikolov examines in detail the available historical data on the outbreak of the epidemic, what is known about its etiology, epidemiology and pathophysiology. It examines in detail the involvement of various organs and systems with their clinical manifestations. In the next part, Dr. Nikolov presents the known laboratory methods for diagnosing the disease. In the following section, the impact of the COVID-19 epidemic on health care, health professionals and patients in Bulgaria and around the world has been examined, presenting the known scientific studies and statistical data. Special attention is paid to the impact of the pandemic on urological hospital practice. Changes by nosological units were examined: in renal transplantation, oncourology, benign diseases, endoscopic operations, laparoscopic operations and robot-assisted surgery, operations using an intestinal segment and in other urological operations.

In the following section, Dr. Nikolov has reviewed basic principles of triage in hospital urology practice. He presented the world experience in the priority directions for treatment and deferred surgical treatment of malignant and benign nosological entities in urology.

The presented problems lead Dr. Nikolov to formulate the **main goal** of the dissertation work, which is **to study and analyze the challenges of the impact of the COVID-19 pandemic on hospitalizations and operational activity in hospital urology practice, proposing an algorithm for behavior after prioritizing patients with various urological diseases.** The purpose of the dissertation is clear and well-articulated.

For the realization of this goal, Dr. Nikolov sets himself six tasks with which to prove his thesis.

Task I. To prepare a retrospective analysis of patients hospitalized and operated in the Clinic of Urology for two periods 2018-2019 and 2020-2021.

Task II. To evaluate the order, choice of anesthesia and duration of operative interventions before and during the COVID-19 pandemic.

Task III. To analyze the impact of the COVID-19 pandemic on therapeutic procedures in patients with malignant urological diseases, urolithiasis and other benign urological diseases.

Task IV. To compare deobstructive methods for the operative treatment of patients with GUT obstructions before and during the COVID-19 pandemic.

Task V. To produce an analysis of the impact of age and comorbidities on patient hospital stays before and during the COVID-19 pandemic.

Task VI. To propose a diagnostic-therapeutic algorithm, adapted to the health system of our country and suitable to serve as a model in a future epidemic situation of a similar nature.

The number of tasks set is quite sufficient to substantiate the main thesis of the dissertation work. They are formulated correctly, clearly and accurately.

In the next section, Dr. Nikolov presents a retrospective analysis of the hospitalized and operated patients at the "Clinic of Urology" at the "St. Marina" UMBAL - Varna for the period 2018-2021. 2 periods are considered: from 1.01.2018 to 13.03.2020 incl. (period before COVID-19) and from 14.03.2020 to 31.12.2021 (period during COVID-19).

The doctoral student performs the descriptive statistical analysis of the groups according to the frequency distribution of the considered characteristics (gender of the patients, number of patients in the individual structures, types of diseases, etc.) broken down by research groups, average values, etc. The differences and changes before and during the epidemic, according to various indicators, are presented.

The next **chapter** presents the obtained **results and discussion**. A decline in hospitalized and operated patients was reported during the epidemic period. The data reviewed worldwide also confirm the decline of these indicators in urology departments. The reason for this is the attempts to limit the disease, the fear of the patients, the illness of the staff, etc. The COVID-19 pandemic has had a significant impact on healthcare worldwide, including urology surgery. In a subsequent analysis, Dr. Nikolov found a trend toward a decline in local and regional anesthesia at the expense of general anesthesia during the COVID period. The operating time increased by 8 minutes, probably in connection with the anti-epidemic measures.

Dr. Nikolov analyzed operative interventions in three subgroups: oncourology, urolithiasis and other benign urological diseases. During the pandemic, urology centers focused on priority operations, especially for urological oncology patients.

An analysis of oncological operations shows a decrease in their number, but an increase in percentage to the performed operations. The most common localization of the operated from oncological diseases is bladder carcinoma.

In an analysis of those operated on with urolithiasis, Dr. Nikolov reports a decrease in the percentage in the period with Covid, as well as a decrease compared to the total operated.

In the hospitalized and operated patients with benign diseases, no statistically significant difference was reported in the two periods.

The European Urological Association recommends consideration of urological diseases at 4 levels: low, intermediate, high priority and emergency. These levels are determined by the likelihood of clinical damage and the length of time treatment can be delayed without significant consequences. As a result of the performed analysis, based on the experience and the obtained results, Dr. Nikolov proposes a diagnostic-therapeutic algorithm of behavior for hospitalization of patients. It is adapted for the management of urological diseases according to their priority in the context of a health crisis. It is proposed that patients are initially divided into three groups according to priority plus a fourth group for emergency conditions. An algorithm of research and behavior in groups is formulated.

The next section involves formulating **conclusions**, the more important of which are:

- Decrease in operating activity by nearly 24% for the period during the course of the COVID-19 pandemic.
- Reduction of planned operations by 18% compared to the total number for both periods, and increase of emergency interventions up to 6 hours after hospitalization by 8% and after 24 hours of hospitalization by 10%.
- A decrease in the choice of local and regional anesthesia by 6% and 1% and an increase in the relative share of general anesthesia by 7%.
- The average operating time before and during the pandemic did not change significantly, reporting a delay of 8 minutes on average due to the increased use of personal protective equipment and strict disinfection measures.
- The share of therapeutic procedures in patients with malignant urological diseases increased by 3.7%, while the share of patients with urolithiasis decreased by 4.4%.

In the **contributions** chapter, Dr. Nikolov formulated five scientific contributions of a practical-applied nature. The most important ones are that for the first time in Bulgaria, the impact of the COVID-19 pandemic on urological surgery is analysed. Another important contribution is the development of a diagnostic-therapeutic algorithm tailored to the country's healthcare system.

In **conclusion**, I can say that the dissertation work of Dr. Doichin Gergiev Nikolov on the topic **"Challenges for hospital urological practice in the conditions of the COVID-19 pandemic"** is properly structured and written in an academically sound style with a marked scientifically applied contribution. The dissertation student fulfilled the scientific objective through the formulated tasks and made correct and logical conclusions.

The scientific value of the dissertation gives me reason to recommend to the respected scientific jury to award Dr. Doichin Nikolov the educational and scientific degree "Doctor".

Yours

29.10. 2023
sincerely:

Prof. Dr. Nikolay Kolev, MD