

## OPINION

By Prof. Dr. Maria Hristova Milanova, DsC

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external member of the scientific jury for the defense of a dissertation thesis for a degree of education and science "PhD" in the scientific specialty "Internal Diseases" on the basis of the order № 15-05-93 # 1/26.09.2023 of the Executive Director and Procurator of the Acibadem City Clinic UMHAT Tokuda EAD

**Subject:** The dissertation on: "**PLACE AND ROLE OF AN EMERGENCY DEPARTMENT OF A MULTIDISCIPLINARY ACTIVE TREATMENT HOSPITAL IN THE APPLICATION OF A DIAGNOSTIC-TERAPUTIC ALGORITHM IN PATIENTS OVER 18 YEARS OF AGE INFECTED WITH SARS-CoV-2 VIRUS DURING PANDEMIA**", developed by Dr. Parvoleta Krasteva Yakova-Krasteva, PhD student on independent training at the Clinic of Internal Medicine of the Acibadem City Clinic UMHAT Tokuda EAD; in the field of higher education 7. Healthcare and sport, professional direction 7.1. Medicine, doctoral programme "Internal Medicine".

**Scientific supervisor:** Prof. Dr. Milena Staneva Staneva, PhD

In connection with my participation as a member of the scientific jury, I declare that:

- I have no conflict of interest;
- The documents meet the minimum requirements set by the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB) and the Regulations for the Implementation of LDASRB and the Regulations for the application of LDASRB in ACC UMHAT Tokuda EAD, Sofia for participation in the competition;
- I find no plagiarism in Dr. Krasteva's dissertation;
- I have found no irregularities in the course of the procedure so far and I have no comments to make on the material submitted for my opinion.

The opinion was prepared in accordance with the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), Regulations for the application of ASDA and the Regulations for the Implementation of LDASRB and the Regulations for the application of LDASRB in Acibadem City Clinic UMHAT Tokuda EAD, Sofia.

### **Presentation of the candidate**

Dr. Krasteva graduated in medicine in 1996 at the Medical University in Sofia. In 2005 she acquired a specialty in Emergency Medicine at Medical University in Sofia. In 2005 she completed her residency in Emergency Medicine in Sofia. She holds a professional qualification in Health Management from the European College

of Economics and Management - Sofia. Plovdiv, 2005, and as of February 2017, a certificate as an Advanced Life Support Training Instructor in a simulated environment from Acibadem University "Center for Advanced Simulation and Education", Acibadem University, Istanbul, Turkey. Since June 2022 he has been a PhD student at the Internal Medicine Clinic of the Acibadem City Clinic UMHAT Tokuda EAD. She is fluent in Russian and English. She started her career as a doctor in 1997 in the Emergency Medical Aid Centre in Sofia. In December 2006 he became part of the team of the Emergency Department at Tokuda Hospital and since March 2017 he has been the head of the same department.

### **Relevance of the topic**

The COVID-19 pandemic has posed a number of challenges to the medical community, regardless of the level of health insurance systems worldwide. COVID-19 surprised with its rapid spread from Wuhan around the world and the reported unexpected high mortality for all ages. Initially, the greatest challenge was not knowing the new virus, developing specific tests to quickly diagnose it, therapeutic options to respond to the infection, and not knowing its long-term effects. No less challenging were the possibilities and means to prevent the spread of SARS-CoV-2, to ensure safe working conditions for medics, to create an organization for access to health services for the population and to prevent the fear of infection with the new virus. At the beginning of the pandemic, there were no guidelines on where to refer patients with fever and signs of viral infection for examination, nor were there clear protocols for dealing with infectious patients in a multidisciplinary hospital setting. The Ministry of Health and the District Health Inspectorates, in accordance with the global anti-epidemic measures, gave basic guidelines, and each hospital had to adapt them to its own specific structure and available human resources and facilities. A huge flow of infected patients was directed to the emergency wards of the multidisciplinary hospitals due to insufficient number of infectious disease specialists and infectious disease wards.

### **Study of the dissertation**

The ratio between the different parts of the thesis is optimal. The dissertation is written in 171 standard pages, contains 4 annexes and is illustrated with 31 tables and 23 figures. It is structured as follows: Abbreviations used - 4 pages; Introduction - 3 pages; Literature review - 30 pages; Aim and objectives - 1 page; Materials and methods - 9 pages; Results - 52 pages; Discussion - 35 pages; Conclusions - 3 pages; Appendices - 9 pages; Bibliography - 20 pages. The bibliography comprises 273 references, of which 18 are by Bulgarian authors, 14 in Cyrillic and 4 in Latin. There are 255 foreign authors.

### **Characteristic features of labor**

In her dissertation, Dr. Krasteva analyzes the structure of an emergency department in a multidisciplinary hospital for active treatment, outlining guidelines and options for its structural reconstruction in the context of an emerging pandemic, so that both patients with COVID-19 and patients without COVID-19 can be served

simultaneously. The patient triage procedure and the sequence of its individual components as performed in the emergency department of the Acibadem City Clinic UMHAT Tokuda EAD. The specifics of the triage process in a pandemic setting are defined. There is a well-established standard in Emergency Medicine, but those working in the emergency departments do not know in detail the essence of triage, and there are no common protocols for triage of patients and no uniform form for triage in emergency departments in Bulgaria. Dr. Krasteva has presented her own organizational experience, tested and applied in practice and especially in the pandemic "Patient triage form in the Emergency department" of the Acibadem City Clinic UMHAT Tokuda EAD, an invariably associated "Nursing Assessment Sheet" for up to 60 minutes and a "Nursing Assessment Sheet" for patients with an emergency department stay of more than 60 minutes. In this dissertation, risk factors for progression and death in COVID-19 are analyzed in detail, and algorithms for diagnosis and primary assessment of patients in the Emergency department of a multidisciplinary hospital are developed.

**The literature review** is presented in 30 pages, based on numerous foreign and Bulgarian literary sources. It consists of two main sections and nine subsections, which present in a sequential order the structural features of SARS-CoV-2 and the accumulated knowledge on risk factors for complicated course and increased mortality in COVID-19.

Analyzed for categorical (sex, comorbidities, transport to ED, lung x-ray/CT) and quantitative (age, number of comorbidities, temperature, SpO<sub>2</sub>, heart rate, number of days with symptoms to examination, leukocyte, lymphocyte, CRP, LDH, ferritin, D-dimer values) parameters from the primary examination of infected patients in the Emergency department that can be used as predictors of the severity of infection and to assess the risk of progression and death. Descriptive, laboratory and imaging, epidemiological and clinical methods were used and interpreted after advanced statistical processing using 6 different methods.

**Structure of the thesis:** The thesis is written in 171 standard pages, contains 4 annexes and is illustrated with 31 tables and 23 figures. The bibliography contains 273 sources, 14 of which are in Cyrillic.

**The aim** of the dissertation is formulated clearly and concretely and in accordance with it are 4 main tasks.

**The dissertation results** are described in detail in 52 standard pages and well illustrated with figures and tables. They are consistent with the stated aim and objectives of the study.

The results obtained are conclusive, presented clearly and accurately for the subgroups studied, enabling follow-up and comparison. Appropriate statistical methods have been used to accomplish the set tasks.

**The main results** of Dr. Krasteva's thesis can be summarized in the following guidelines:

1. The organizational guidelines for the structural reorganization of the Emergency Department into a multidisciplinary hospital for active treatment in pandemic conditions are outlined.
2. The process for triaging patients during a pandemic and managing patient flow from the Emergency Department area is described and characterized.
3. Risk factors for a complicated course of COVID-19 and the need for hospitalization were defined based on data from the primary examination in the Emergency Department.
4. Risk factors for COVID-19 progression and subsequent hospitalization in outpatients were defined based on data from a follow-up examination in the Emergency Department.
5. Risk factors for lethality in hospitalized patients with COVID-19 were derived from primary examination data in the Emergency Department.
6. The factor of time of stay of patients in the Emergency Department until the decision for therapeutic management during a pandemic was analyzed.
7. The influence of early administration of specific antiviral therapy in the Emergency Department on the course of infection was reported.
8. Eight algorithms for diagnostic and therapeutic management in the Emergency Department of a multidisciplinary hospital at COVID-19 have been developed and tested in practice.
9. A modified algorithm for management of suspected infectious disease in the Emergency Department of a multiprofile hospital for active treatment is proposed.

The conclusions drawn are comprehensive and fully in line with the aim, objectives and results obtained. The contributions of scientific and organizational nature are correctly formulated and adequately synthesize the significance of the dissertation work.

The practical applicability of the work is illustrated in the derivation of clear diagnostic and therapeutic algorithms in patients with COVID-19 over 18 years in a multidisciplinary hospital with important implications for clinical work.

#### **Scientific publications related to the thesis**

The PhD student has submitted four articles, including two research articles as first author, one in press, and two research articles as co-author, related to the dissertation topic. She has also presented two papers: at a scientific conference, where the topic - Algorithm for suspected COVID-19 in an Emergency Department of a multidisciplinary hospital; and a national congress with international participation, with a poster entitled - Possibilities of modifying a diagnostic algorithm for COVID-19 into a general algorithm of management of suspected infectious disease in an emergency department of a multidisciplinary hospital.

The number of scientific publications and participations corresponds to the requirements of the Regulations on the terms and conditions for acquiring scientific degrees and holding academic positions at Acibadem City Clinic UMHAT Tokuda EAD.

## CONCLUSION

The dissertation thesis of Dr. Parvoleta Krasteva Yakova-Krasteva "Place and Role of the Emergency Department of a Multidisciplinary Hospital for Active Treatment in the Implementation of the Diagnostic and Therapeutic Algorithm in Patients Over 18 Years of Age Infected with SARS-CoV-2 Virus during a Pandemic" is up-to-date and represents a completed work, complying with the Academic Staff Development Act and the Regulations on the Conditions and Procedures for the Acquisition of Scientific Degrees and Academic Positions in Acibadem City Clinic UMHAT Tokuda EAD, Sofia for obtaining the scientific degree "Doctor" in the doctoral program "Internal Diseases".

The dissertant Dr. Krasteva shows very good knowledge in the field of the chosen scientific topic with detailed follow-up and summarization of the data. This determines the possibilities of precision, competence and criticality in analyzing the obtained results for accurate conclusions and logic in discussions. The dissertation is of scientific and practical value.

This gives me grounds to confidently propose to the esteemed members of the Scientific jury to vote positively for the award of the educational and scientific degree "PhD" to Dr. Parvoleta Krasteva Yakova-Krasteva, PhD student in independent training at the Clinic of Internal Diseases in Acibadem City Clinic UMHAT Tokuda EAD, Sofia.

30.10.2023

Prepared the opinion:



Prof. Dr. Maria Hristova Milanova, DsC