

To  
the Chairman of the Scientific Jury  
assigned by the Executive Director  
of the National Hospital of Cardiology  
with order No 54/ 01.02.2022

## **R E V I E W**

by

**Prof. Dr. Dimitar Georgiev Petkov**

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**"Prof Dr. Al. Tschirkov" University Hospital, Sofia**

**Subject:** Participation in a competition for the academic position of "Associate Professor" in the field of higher education 7. Health and sports, Professional field 7.1. Medicine with specialty "Cardiac Surgery" for the Department of Cardiac Surgery needs at the National Hospital of Cardiology, LTD, announced in SG issue no. 96/02.12.2022.

**Dear Members,**

Dr. Dimitar Ivanov Kyuchukov is the only candidate participating in the current competition. He was born on 18.10.1976. He graduated from Medical University-Sofia in 2000 with - a Master's Degree in Medicine, with excellent results from the state exams. In the same year, he was appointed as a resident in the Cardiac Surgery Clinic at the University Hospital "St. Ekaterina," Sofia. From 2016 to 2022, he held the Head of the Department of "Surgical Treatment of Acquired Heart Diseases " position at the same hospital 2022- 2023 he was the interim executive Head of the Department of Cardiac Surgery at the National Hospital of Cardiology, and from 2023 till the present- after a competition, he is the acting Head of the Department of Cardiac Surgery at the National Hospital of Cardiology. Since 2008, after a competition, he has been appointed

Assistant at the Department of Cardiovascular Surgery at Medical University Sofia. In 2019 he became Chief Assistant Professor in the Department of Cardiovascular Surgery and Invasive Cardiology at Medical University Sofia. In 2016 he successfully defended his dissertation: Surgical treatment of acquired heart diseases and obtained an educational and scientific degree "Doctor" in Cardiac Surgery diploma from MU-Sofia. In addition, he has a certificate in Health Management issued from MU, Sofia. He is also certified for a basic level of Electrical cardiac stimulation. The candidate is a member of the Bulgarian Society of Cardiac Surgery, and since 2022 he has been elected to its board of directors. Dr. Kyuchukov is a member of the Bulgarian Association for Thoracic, Cardiac, and Vascular Surgery and the European Association of Cardio-Thoracic Surgery.

### **1. Research activity:**

In the current competition, Dr. Kyuchukov participates with the following evidence for the occupation of the academic position "Of Associate Professor."

**1.1 Defended dissertation** on the topic: "Surgical treatment of atrial arrhythmias" MU-Sofia

**1.2 Original monograph** - "Surgical treatment of atrial fibrillation" -- ISBN 978-619-753686.

Prof. Dr. G. Nachev, Ph.D., Assoc. Prof. Dr. B. Baev, MD, and I reviewed the monograph. The monograph discusses all current problems in the surgical treatment of atrial fibrillation. In addition, it contains the author's own experience and a detailed description of the logic and technique for performing antiarrhythmic operations. The candidate started a sequence of work with his dissertation on research and introduction of this new type of surgical operation in Bulgaria for treating the most common supraventricular arrhythmia.

**1.3 Publications.** Dr. Kyuchukov submitted 28 publications for the present competition, all different from those offered for obtaining the academic position of "Doctor." 11 publications were published in English in journals indexed and referenced in international databases (Scopus, Web of Science). In addition, nine are published in journals with an Impact Factor (Heart Surgery Forum, Journal of Cardiothoracic Surgery, and Minerva Medica- Journal of Cardiovascular Surgery), for which the applicant has submitted a reference from the Central Medical Library. In 4 publications reviewed so far, Dr. Kyuchukov is the first author. The remaining 17 articles were published in Bulgarian journals or peer-reviewed reports. In 11 of them, Dr. Kyuchukov is the first author.

**1.4 A chapter in a Collective Monograph.** For the competition, Dr. Kyuchukov also presented three chapters of a collective monograph, in which he is a co-author.

**1.5 Citations.** Till 31.12.2022, according to a quote from the Central medical library, the candidate has 12 citations in Bulgarian peer-reviewed journals and one in a journal with an Impact Factor available in Web of Science. After 01.01.23, the candidate submitted evidence for 7 more citations with Bulgarian peer-reviewed journals.

## **2. Profile of scientific research.**

**2.1. The main scientific interests** of Dr. Kyuchukov are in the surgical treatment of atrial fibrillation, which is reflected in the predominant number of publications on the subject, the defended dissertation, and the author's monograph (numbers-1,2,11,18,19,20 from the submitted report). This scientific work details all aspects of this problem in heart surgery patients - etiology, epidemiology, pathophysiology, risk factors, surgical techniques, and outcomes. In the dissertation, an algorithm indicating the patients suitable for the operation was developed. In the monograph, the surgical techniques used are described in detail. The mandatory sequences of activities guaranteeing the effectiveness and safety of the antiarrhythmic procedures performed during another major heart operation are described in the appendix.

**2.2. Scientific works related to other problems in Cardiac Surgery.** The candidate, as part of a team from Sveta Ekaterina Hospital, participated in a few types of research investigating the results of surgical treatment in several important groups of patients:

A) Surgical revascularization of the myocardium (3,4,5,14,15,24,27).

B) Surgical treatment of complications of ischemic heart disease (7;10;17;28;31;32;33);

C) Surgical treatment of aortic diseases (9,12,13,21,22,29,30)

D) Surgical treatment of mitral valve diseases (6,16,23)

E) Surgical treatment of aortic valve diseases (8,25)

F) Surgical treatment of pulmonary thromboembolism (26)

### **3. Important Scientific Contributions**

#### **3.1 Original contributions related to the dissertation work**

1. A prospective non-randomized study of intraoperatively performed radiofrequency ablation in patients with atrial arrhythmias operated in conditions of extracorporeal circulation was conducted.
2. For the first time in Bulgaria, an analysis of the pre-and post-operative characteristics of patients with atrial fibrillation operated under conditions of extracorporeal circulation was made.
3. For the first time in Bulgaria, a one-year follow-up of patients with supraventricular arrhythmias operated under conditions of extracorporeal circulation was performed.
4. The factors influencing the one-year survival of patients undergoing intraoperative radiofrequency ablation were analyzed for the first time in Bulgaria.
5. For the first time in the country, the risk factors for failure of surgical ablation have been identified.
6. Post-operative problems in heart surgery patients with atrial fibrillation were analyzed.
7. A positive correlation between the performance of surgical radiofrequency ablation and conversion to sinus rhythm was confirmed.
8. A positive correlation was confirmed between the performance of surgical radiofrequency ablation and the improved ejection fraction at the end of the follow-up period.
9. For the first time in Bulgaria, it has been confirmed that Radiofrequency ablation is an effective and applicable method for treating supraventricular arrhythmias.
10. An algorithm was developed to indicate patients with atrial fibrillation for surgical treatment.

### **3.2. Original contributions related to the author's monograph**

1. A detailed review of the modern aspects of all possible surgical methods for the treatment of Atrial Fibrillation is made for the first time in Bulgaria.
2. This is the first monograph on this topic in Bulgaria.
3. The author's experience treating atrial fibrillation with radiofrequency ablation devices is also shared.
4. Algorithms have been developed for the staged implementation of the "Labyrinth" procedure when used during any other cardiac surgery.
5. The possibilities of creating a hybrid team of cardiologists, electrophysiologists, and cardiac surgeons, aiming to perform complex interdisciplinary treatment of atrial fibrillation were considered.
6. The so-called intraoperative "Check Lists" guaranteeing the safety and efficiency of the labyrinth operation were introduced.

### **3.2 Contributions Related to the Publications**

#### **3.3.1. Contributions of an original nature to Bulgaria**

##### **Contributions as part of a team:**

1. Use of an automatic stapler for proximal anastomoses in bypass surgery; (5)
2. Study of the results achieved with valve-preserving operations of the mitral valve performed for 18 years (6)
3. Study of the results of the largest group of patients operated for the correction of postinfarction left ventricular aneurysms. (7;10)
4. Development of strategies for a hybrid approach in the treatment of complex aortic pathology (9,13)

### **Contributions as a first author:**

1. Successful surgical treatment of esophageal rupture after endovascular implantation of a stent graft in the thoracic aorta (12).
2. Reconstruction of the aortic valve and aortic root using the new technique - Florida Sleeve (22)
3. Introduction of a new methodology for the preparation of vein grafts for coronary bypass surgery (24)
4. Introduction of simulation training for surgical reconstruction of the mitral valve according to a scientific project of Medical University-Sofia (23).
5. Introduction of a seamless aortic valve prosthesis implantation through an upper mini sternotomy (25).
6. Introduction of axillary artery cannulation indications in extracorporeal circulation operations (21).
7. Use of a new technique for retrograde perfusion of the pulmonary vessels in cases of pulmonary thromboembolism indicated for surgical treatment (26)
8. Introduction of a protocol for antithrombotic drug treatment after coronary artery endarterectomy (3)

### **3.3.2 Contributions of a confirmative nature**

1. Results of reoperations after mitral valve surgery (16)
2. Results of a Hybrid Approach in treating Aortic Dissections and Aneurysms(9)

### **.4. Teaching activity.**

According to the submitted official report by the Faculty of Medicine of MU-Sofia, Dr. Kyuchukov's classroom workload for the past three years has been over 250 hours per year, a total of 780 hours. In addition, in the last two years, he supervised two residents.

5. According to the requirements of the Academic Staff Development Law of the Republic of Bulgaria, the Application Regulations, as well as the Regulations of the terms and order of acquiring an Academic position in the National Hospital of Cardiology, Dr. Dimitar Kyuchukov meets more than the minimum requirements, as follows:

#### SCIENTOMETRICAL INDICATORS

Group of Indicators	Indicators	Minimum points required	Total points
<b>A</b>	<b>1. Dissertation</b> for obtaining of educational and scientific degree "Doctor."	<b>50</b>	<b>50</b>
<b>B</b>	<b>3. Habilitation work – monograph</b>	<b>100</b>	<b>100</b>
<b>C</b>	<b>7. Publications</b> and reports published in scientific journals, referenced and indexed in a world-renowned database of scientific information <b>8. Publications</b> and reports published in unreferenced peer-reviewed journals or edited collective volumes <b>9. Published</b> chapter of a collective monograph	<b>200</b>	<b>298</b>
<b>D</b>	<b>10. Citations</b> or reviews in scientific publications referenced and indexed in world-renowned databases of scientific information or monographs and collective volumes <b>12. Citations</b> or reviews in unreferenced peer-reviewed journals	<b>50</b>	<b>110</b>
<b>TOTAL</b>		<b>400</b>	<b>558</b>

## 6. Conclusion

I have personally and professionally known Dr. Kyuchukov for over twenty years. During his development years from a cardiac surgery specialist to the head of one of the two oldest and most well-known structures in cardiac Surgery in Bulgaria, he developed as an excellently prepared practical and theoretical plan specialist and teacher. The evidence of the scientific research, professional practice, and teaching activity that Dr. Kyuchukov presents allows me to give my positive assessment. Therefore, I recommend the other respected members of the Scientific Jury to vote positively and award Dr. Dimitar Ivanov Kyuchukov with the academic position "Of Associate Professor" for the needs of the Department of Cardiac Surgery at the National Hospital of Cardiology.

14.03.2023

Sofia

Prof. Dr. Dimitar Petkov MD ScD

