

# Peer review

by Prof. Gencho Krastev Nachev, MD, PhD, DSc

National consultant of cardiac surgery

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of the dissertation thesis entitled

**POSSIBILITIES OF TRANSIT-TIME FLOWMETRY FOR  
INTRAOPERATIVE BLOOD FLOW OBJECTIFICATION AND  
COMPARISON IN CORONARY SURGERY ON A 'BEATING HEART'  
AND WITH EXTRACORPOREAL CIRCULATION**

for the acquisition of the educational and scientific degree of 'Doctor' in the field of  
higher education No 7 "Public health and sports", professional direction No 7.1  
'Medicine' and scientific speciality of 'Surgery'

Author: Vladimir Borisov Kornovski, MD, PhD student at the Department of Surgery,  
Medical University "Prof. Paraskev Stoyanov" of Varna

Scientific adviser: Prof. Plamen Georgiev Panayotov, MD, PhD

### **Characteristics, volume and structure of the dissertation**

- Contents – 2 pages
- Abbreviations – 1 page
- Introduction – 2 pages
- Review of literature – 64 pages
- Purpose and objectives – 1 page
- Material and methods – 25 pages
- Own results – 44 pages
- Discussion – 41 pages
- Concluding remarks – 2 pages
- Conclusions – 2 pages
- References – 28 pages
- List of publications related with the dissertation thesis – 1 page

The dissertation is illustrated with 110 tables and 35 figures. The list of references includes 226 titles, of which 10 are in Cyrillic and 216 are in Latin.

### **Biographical data**

Dr. Vladimir Borisov Kornovski was born on January 1, 1974 in the city of Varna. He graduated from Frédéric Joliot-Curie Fourth French Language High School of Varna. In 2002, he completed his medical education at the Medical University “Prof. Paraskev Stoyanov” of Varna. He has acquired specialties in surgery and cardiac surgery. Since 2005, the PhD student works as a surgeon in the Cardiac Surgery Department of St. Marina University Hospital of Varna. He is assistant professor in the Department of Surgery, Medical University of Varna. He speaks French and English languages.

### **Publication activity and research**

In 2017 and 2018, the PhD student has published four scientific papers on the topic of the dissertation. He is the sole author of one article and the first author of the other



three papers. Results of the dissertation thesis have been delivered at three scientific forums in Bulgaria and one abroad. The scientific activity during the period of preparation of the dissertation thesis is in compliance with the regulatory requirements.

### **Actuality of the dissertation**

The dissertation thesis is devoted to an actual and important problem in the cardiac surgical practice. Surgical myocardial revascularization, including the conventional CAB method with the use of extracorporeal circulation (ECC) and the CAB method on a 'beating heart', are well-established surgical techniques for the treatment of coronary artery disease. Intraoperative assessment of blood flow through the performed coronary bypass is in some cases an important factor in surgeon's subsequent behaviour. In our country, there is no published data on the clinical application of this specific methodology, i.e. transit-time flowmetry. This makes the topic of dissertation work relevant.

### **Literature review**

The detailed literary review of the problem under study, the detailed analysis of the cited data, most of which have been published in the last three years, show PhD student's adequate knowledge on the topic of the dissertation thesis.

### **Purpose and objectives**

The purpose of the dissertation is formulated clearly and precisely - to analyze the possibilities of transit-time flowmetry for early objective evaluation of coronary blood flow in the performed coronary bypass and to optimize the surgical strategy in patients with coronary artery disease. In order to achieve it, the candidate determined the fulfilment of six basic tasks, based on the hypothesis that the method of intraoperative transit-time flowmetry can timely detect coronary graft dysfunction and justify further behaviour in patients with conventional CAB and those revascularized with CAB on a 'beating heart'.

### **Material and methods**

The operative techniques of myocardial revascularization in 143 patients operated on during the period 2014-2017 are presented. The patients are divided by sex, age, number of accompanying diseases and type of surgery performed. The statistical methods used for analysis are listed.



## **Results and discussion**

The analysis of the results is structured in five sections, which are well-illustrated with tables and figures. The operative parameters such as left ventricular ejection fraction and duration of the procedure, haemodynamic values obtained from blood flow evaluation - pulsatile index and volume of blood flow through the bypass, as well as some laboratory data were examined and evaluated. Algorithm and behaviour of flowmetric measurements, when revascularization is done with conventional CAB with the use of ECC and CAB of a 'beating heart', as well as with a mini-invasive technique, are described in detail. The discussion follows the logic of the study and adequately comments on the results. In the discussion, a detailed comparative analysis of the results presented by the PhD student and those achieved by other authors on the topic was made.

## **Conclusion**

In the conclusion section, the most important achievements of this study are summarized.

## **Contributions**

The dissertation thesis ends with six specific, well-formulated contributions, which correspond as solutions to the defined tasks. Concerning the presented contributions, I do not accept Nos. 2 and 4 of those with confirmatory character.

The dissertation abstract is structured according to the requirements and its contents are completely in accordance with the dissertation thesis.

## **Concluding remarks**

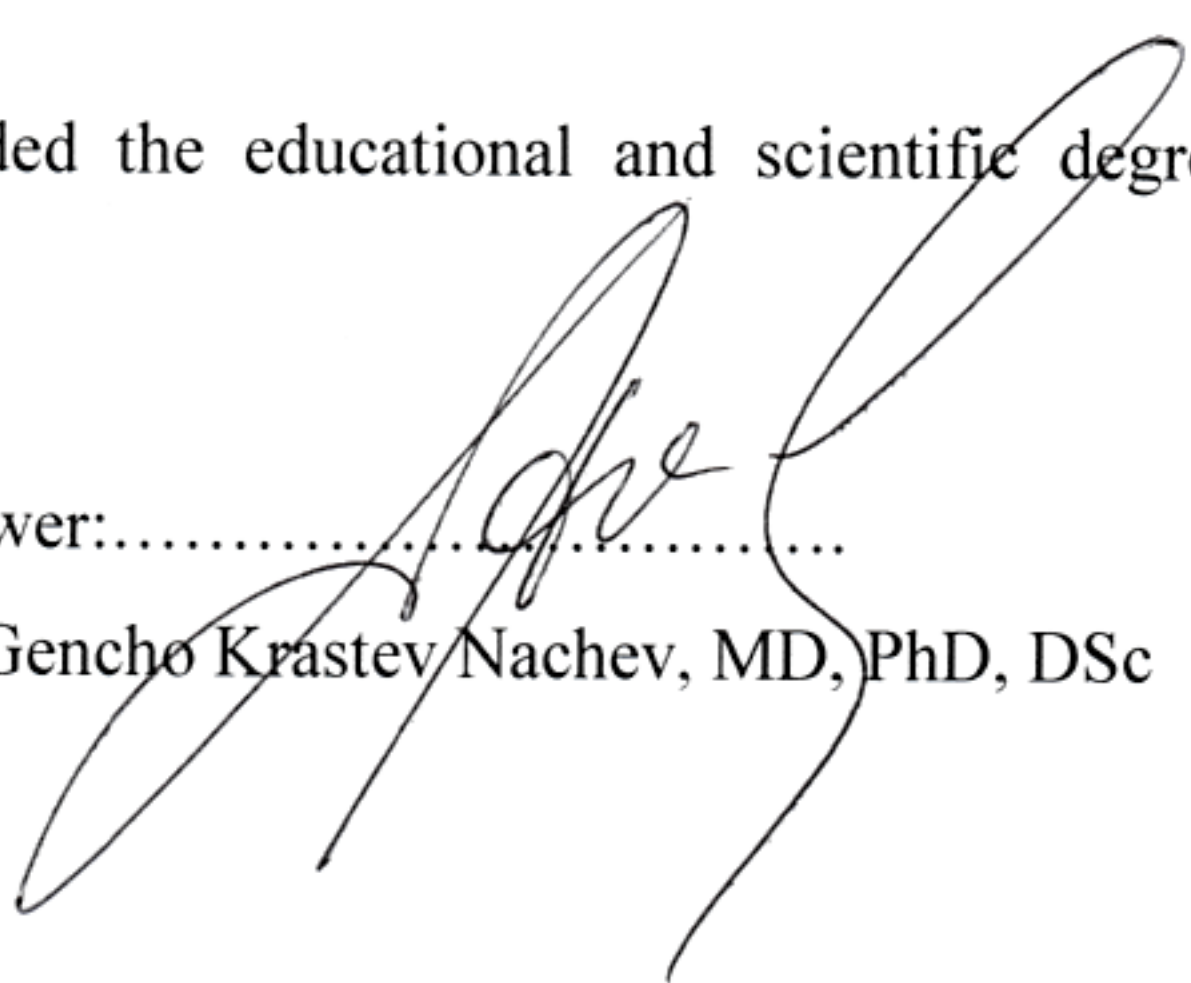
The dissertation thesis submitted for peer review represents the author's personal scientific work. I believe that the dissertation is characterized by originality and completeness. The results presented are of a positive merit for the practical cardiac surgery. The PhD student Vladimir Borisov Kornovski, MD, possesses in-depth theoretical knowledge, professional skills in cardiac surgery, as well as qualities and skills for conducting independent scientific research.

In view of the above, I give my positive assessment of the dissertation thesis presented and propose to the members of the distinguished Scientific Jury, Vladimir

Borisov Kornovski, MD, to be awarded the educational and scientific degree of  
'Doctor'.

26.08.2019

Sofia

Reviewer:.....

Prof. Gencho Krastev Nachev, MD, PhD, DSc