UNIVERSITY CARDIOLOGY CLINIC

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Abstract
In distant 1972, within framework of the Internal Clinic, a cardiologic department was organized which was
soon, on 29.XII.1974, transformed into the Cardiology Clinic, later the Institute for Heart Diseases, and in
2008 was renamed the University Cardiology Clinic. The greater part of its foundation was possible owing to
Prof. Dimitar Arsov and Prof. Radovan Percinkovski, who was the clinic’s first director in the period from
1974 to 1984. In 1985, the Clinic moved into its own new building, and in that way was physically detached
from the Internal Clinics. Until its move to the new building, the Clinic functioned in the Internal Clinics build-
ing, organized as an outpatient polyclinic and inpatient infirmary department with clinical beds, a coronary
intensive care unit and a haemodynamics laboratory equipped with the most modern equipment of that time.

Today the Clinic functions through two integral divisions: an inpatient infirmary department which comprises
an intensive coronary care unit and fourteen wards which altogether have 139 clinical beds, and the diagnostic
centre which comprises an emergency clinic and day hospital, a communal and consultative outpatients’ clinic
functioning on a daily basis, through which some 300–350 patients pass every day, and diagnostic laboratories
with a capacity of nearly 100 non-invasive and 20–30 invasive diagnostic procedures daily.

The Clinic is a teaching base, and its doctors are educators of students at the Medical, Dental and Pharmacy
Faculties, and also of students at the High School for Nurses and X-ray technicians, but also for those in
Internal Medicine and especially Cardiology. The Clinic is also a base for scientific Masters’ and post-doctoral
studies, and such higher degrees are achieved not only by doctors who work here, but also by doctors from
Medical Centres both in the country and abroad.

Doctors working in this institution publish widely, not only a great number of books and monographs, but also
original scientific papers published in indexed medical journals.

Key words: Cardiology Clinic.

Foundation
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2008 was renamed the University Cardiology Clinic. The greater part of its foundation was possible owing to Prof. Dr. Dimitar Arsov and Prof. Dr. Radovan Percinkovski, who was the clinic’s first director in the period from 1974 to 1984. In 1985, the Clinic moved to its own new building, and in that way was physically detached from the Internal Clinics.

The period following its separation from the common Internal Clinic was a period of fast development, especially in terms of the use of modern cardiological knowledge, the on-going education of all its employees, and the timely use of new invasive and non-invasive diagnostic and therapeutic procedures, which all led to a considerable increase in its activity and volume of work, which follows the current world trend of an increased incidence and prevalence of cardiovascular diseases, which throughout the world are the first three pathologies according to morbidity and mortality.

The reason for its foundation
In 1947, in the after-war period, the foundation of the Medical Faculty in Skopje and the Internal Medicine Department led to a large-scale transformation of what had been called the "Zemska bolnica" (County Hospital), and the foundation of the
Internal Clinic. Prof. Dr. Aleksandar Ignjatovski was at that time the figure on whom every young doctor relied, and at that time there were several young doctors, such as Dr. Arsov, Dr. Tadzer and Dr. Angelkovski. At the time, the Internal Clinic had about 116 clinical beds, a small biochemical laboratory, X-ray apparatus and an ECG machine. In the next ten years, the Internal Clinic expanded technically, and in terms of staff and space. There was a period of the separation of different departments of internal medicine which was a consequence not only of the technical and technological advance and doctors’ education, but also of the change in the epidemiological map of the Macedonian population. As a result of this, in 1956 several departments were organised: Cardiology, Pulmonology, Gastroenterohepatology, Haematology, Endocrinology and Nephropathy with Reumatology.

The period up to 1974 was a period of technical, medical and scientific expansion, a period of employment of young personnel who had completed their education in various European and world medical centres and thanks to their knowledge, they contributed to the development of the departments where they were working.

At a specific moment it became very clear that access to and the use of their new medical knowledge and the separation of the departments was not possible in such a large organization as the Internal Clinic was, which meant that the next development and advancement of the subspecialistic branches was made available through separating off, and foundation of individual clinics. Not so easily, but with a full consciousness of this modern need, in 1974 the doctors took the decision to divide the Internal Clinic, and several University Clinics were formed. They continued the process of team work and they still use the multidisciplinary access to disease treatment and function within the framework of Department of Internal Medicine.

How did this process develop in the area of cardiology?

During the foundation of the Internal Clinic in cardiologic pathology there was a domination of valvular diseases – natural and developed heart defects. But modern life was changing the structure of the diseases, so that coronary artery disease slowly but significantly took over the primacy, not only with a predominance in morbidity, but also in hospital and overall mortality. In that early period the hospital mortality of acute myocardial infarction was up to 30%. This was a reason for the doctors who worked in the cardiology department to strive for constant medical improvement, following and adopting modern diagnostic and therapeutic procedures used in the diagnosis and therapy of cardiologic diseases, with the strict purpose of reducing the morbidity and mortality associated with cardiovascular diseases.

Among the therapeutic procedures used in that period was, for example, the first electric cardioversion and defibrillation of a patient with a malignant disfunction of the heart rhythm, carried out in 1973, which from a medical aspect represents a historic moment of transformation in terms of the access to disease treatment, from passive to active. Modern treatments that are used all around the world, especially in the domain of invasive and interventional cardiology, also found a place in our institution, in some sections simultaneously with their use at a universal level. All this changed the access to treatments in modern cardiological pathology presented through coronary artery disease, especially in the form of acute myocardial infarction, failures in rhythm and function and the new etiological entities of valvular diseases. The doctors at the Cardiology Clinic had a vision of an integrative internal and surgical treatment of cardiovascular diseases, renaming the Cardiology Clinic the Institute for Cardiovascular Diseases, providing space for this type of expansion, which would mean the foundation and function of cardio-surgery together in a single institution. Many world-famous heart surgeons gave their support to this idea, but unfortunately for a variety of objective and subjective reasons the idea still remained unrealized.

Viewed from today, the decision on the organization of special Internal Clinics for sub-specialization is a historic decision which provided for the constant development and advancement of the treatment of internal diseases in our country.

Structural and organizational installation

Up to the move of the Cardiology Clinic to its new building, it functioned in the Internal Clinics building, organized as: an outpatient and inpatient polyclinic and ward with 42 clinical beds, with a coronary intensive care unit and a haemodynamic laboratory, equipped with the most up-to-date equipment.

Today the Clinic functions through two integral divisions:

1. Inpatient hospital department which contains:
   – Intensive Coronary Care Unit that was organized for the first time in 1973 as the coronary division, thanks to Prof. Lazar Srbionovski. Today it has some 17 beds, and
   – Wards, some fourteen, which altogether have 139 clinical beds.
II. Diagnostic centre which contains:

– Emergency Outpatient Clinic and Day Hospital (capacity of 7 beds);

– Communal and Cardiology Consultative Outpatient Clinic (7 altogether), which function on a daily basis, through which some 300–350 patients pass every day and

– Diagnostic laboratories:

1. ECG laboratory
The electrocardiographic laboratory was the most frequently used laboratory in the framework of the Internal Clinic which, thanks to the technology provided, secured electrocardiograms interpreted by an educated doctor.

Today this is still the most frequently used laboratory in the clinic, with a frequency of about 300–350 ECGs, which means that the number of static ECGs per year is over 70,000.

This laboratory has been functioning since the time when the Cardiology Clinic had not been separated as an individual clinic, when it served the needs of the Internal Clinic and all its divisions.

This diagnostic method, which is nowadays simple, accessible and cheap, has lost nothing of its diagnostic relevance and still presents a plain tool in the hands of the cardiologist and the internist, but also a task for the parent doctor as well.

2. Laboratory for coronary stress test
The treadmill test is one of the oldest diagnostic methods. It was introduced in our clinic in 1976, when the doctors started working with two machines.

Up to now more than 100,000 patients have passed through this laboratory, and today the average number of patients per year who enjoy the benefits of this laboratory is about 5,000.

In the same clinic there are several protocols of loading, the use of which depends on the diagnostic purpose:

– Standard protocol according to Bruce, which is a stress test on a treadmill performed for the detection of KAB, assessment of functional capacity, monitoring patients with hypertensive disease, detection of arrhythmias;
– Modified protocols:
– The Modified Bruce protocol;
– Protocol for early rehabilitation of patients with AMI.

These are used for specific categories of patients, such as the early post-MI phase in patients treated with fibrinolysis for the detection of residual ischaemia, for patients with heart disease, to provide early rehabilitation of post-MI patients.

3. Laboratory for echocardiography
This laboratory was formed in distant 1978, when it started working with one M-mode echocardiographic machine. In addition to the electrocardiographic laboratory, this is one of the most frequently used laboratories in the clinic, with an average number of 12,000 patients per year.

The laboratory follows world methods of modernizing echocardiographic techniques, accepting:

– TTE-standard 2D Colour Doppler transthoracic echocardiography;
– TEE-transoesophageal echocardiography;
– stress echocardiography; and
– contrast echocardiography.

This is a method which gives a view of the structure and morphology of the heart structures, including the valvular apparatus, the three heart covers and the large blood vessels, but also an assessment of myocardial perfusion, i.e. the detection of myocardial ischaemia.

4. Laboratory for clinical nuclear cardiology
This laboratory is an example of very successful long-term inter-institutional cooperation between the Cardiology Clinic and the Institute for Pathophysiology and Nuclear Medicine which opened thanks to Prof. Dr. Isak Tadzer.

This led to several important years of work, and also to the development of the use of nuclear cardiological techniques:

– 1981 – use of scintigraphic methods with Tc99m pyrophosphate in the diagnosis of coronary artery disease through the detection of myocardial scarring;
– 1985 – the start of the use of RNV – radiouclide ventriculography for patients with coronary artery disease, and later for patients with hypertensive disease, valvular disease and heart failure;
– 1996 – initiation of planar myocardial perfusion scintigraphy in the detection of KAB with the use of TI201;
– 1998 – initiation of SPECT MPI in the diagnosis and prognosis of KAB, a method which over this ten-year period has been used for more than 5,000 patients, which means about 500 patients are processed annually in this examination which gives a view of myocardial perfusion and left ventricular function.

5. Vascular laboratory
The Vascular Laboratory was formed and started work on 09.V.1982. At first there was only one machine for vascular assessment (Medasonic with Doppler D10, photoplethysmograph and strain plethysmograph) which was used to perform investigations of the artery and vein vascular tubes at the extremities and also the magistral neck arteries. The average number of investigations performed with this machine is about 1,000–2,000.
In 1997 the laboratory was supplied with a colour Doppler machine with spectral analysis, and since 2000 the services of the Echocardiography Laboratory have been used to perform investigations with Echo Duplex sonography on magistral arteries and veins.

Up to now around 50,000 patients have been monitored with one of the few diagnostic methods of this laboratory, which means that about 1,500–2,000 patients per year are provided with one of these treatments:

– examination of arterial circulation (detection of circulatory insufficiency);
– examination of vein circulation for the detection of conditions such as: vein varicosity, thrombophlebitis and postthrombotic syndrome;
– examination of circulation in the arms (detection of vasospasms);
– examination of arterial circulation of the magistral arteries of the neck.

6. Laboratory for dynamic monitoring of blood pressure

This is one of the newest laboratories and started working in 1996. At present it functions as a part of the Hypertension Centre. Up to now more than 6,000 patients have undergone dynamic monitoring of the blood pressure, which means there are about 600 patients per year. The examination helps in the diagnosis of artery hypertension, in some cases it is a good way to detect etiology, regularity of blood pressure and also arterial hypotension.

7. Laboratory for 24-hour ecg-holter monitoring

The laboratory for dynamic EKG monitoring has been functioning since 1988. More than 70,000 patients have passed through this laboratory up to now, which means that per year 1,500–2,000 patients have been examined.

This examination helps to detect derangement of rhythm and the interpretation of the CAD, especially asymptomatic myocardial ischaemia.

8. Laboratory for implantation of durable electrostimulants and technical control

This laboratory started working in distant 1973 when an implantation on a temporary and also a durable electrostimulant was carried out for the first time at the Cardiology Clinic. Great credit for this is due to Prof. Lazar Srbinovski. At that time the operation was performed in cooperation with doctors from the X-ray Institute and the Vascular Surgery Clinic.

They first started work with only three "pace makers" which were implanted in 1973, but the number soon increased up to 220 implantations per year (2007). Up till now doctors have performed over 3,600 implantations and/or reimplantations of durable electrostimulants. The process follows the latest world trends in programming and method of working, from one, to two chamber, and up to resynchronized therapy as well. It provides not only their implantation, but also through periodic checks: the technical regularity is followed, the method of functioning is modified (the act of reprogramming), and the duration, which provides a means of distinguishing the optimal time for reimplantation.

9th April, 1996 is the second most significant moment in the history not only of this laboratory, but in the history of the clinic as well. This was the date of the first implantation of an ICD-implantable cardioverter defibrilator, a device which provides life for a certain category of high-risk patients with consecutive malignant arrhythmias. Up to now 48 patients in our country have had this kind of apparatus, of whom 36 were implanted right here, in this laboratory.

Great credit in the use and the development of this therapeutical procedure goes to Prof. Dr. W. Reiser, a cardiologist from the Cardiological Clinic in Nurnberg, who unsselfishly helped in the initiation of a series of diagnostic and therapeutic procedures in the area of invasive and interventive cardiology in our clinic, and as well in the education of the personnel necessary for them to perform this kind of procedure on their own.

Chart 1 – Distribution of patients according to number of implanted durable electrostimulators, 1973 to 2007
9. Laboratory for electrophysiology

This laboratory was formed in 1993, and it was an offspring of the laboratory for durable electrostimulation of the heart.

The first electrophysiological study was performed in 1993, and in 1994 the first therapeutic procedure – ablation – was performed. Starting with only three procedures in 1993, that number increased to 135 in 2005, and then it was established at only 80 studies per year. Up to now, 836 electrophysiological studies have been made, 482 of them continued with a therapeutically ablative technique, with a dynamics of two ablations in 1994 up to 83 in the year 2005.

![Chart 2 – Dynamic of electrophysiological studies and ablations performed in the Electrophysiology Laboratory](image)

10. Angiologic laboratory

The beginnings of this laboratory were in 1973, when the Haemodynamic Laboratory started working within the boundaries of the X-ray Institute. A short time after the Clinic moved into its own building in 1993, a special department began to develop in the same clinic – the Angiologic Laboratory, after the purchase of the first angiographer.

From that period up to now, more than 30,000 patients have passed through this laboratory (in some cases diagnostic and therapeutic procedures have been performed more than once).

Today there are two angio wards with two angio apparatuses working at the same time, with a daily average of twenty patients. Around 30,000 diagnostic examinations have been performed up to now: selective coronary arteriographies, aortographies, carotidographs, renal and peripheral arteriographies, starting with a number of 350 in 1993 and reaching 3,600 in 2007.

A special therapeutic procedure is performed in some 13,500 patients: PTCA, PCI or PKI, of which 3,500 interventions are performed as primary PCI procedures in a phase of acute myocardial infarction.

![Chart 3 – Distribution of patients according to diagnostic studies, PCI procedures and primary PCI procedures, 1993 to 2007](image)

Legend: DCA – selective coronary arteriography; PCI – percutaneous coronary intervention; Primary PCI – percutaneous coronary intervention in patients with AMI

Here are some of the most important years for this laboratory:

- 1993 – first balloon dilatation on CA;
- 1995 – first implantation of endovascular prosthesis on CA;
- 1995 – first primary PCI with the presence of AMI;
- 1999 – first PKI on a peripheral artery (renal);

At the moment the work of this laboratory is developing into two angio laboratories, which means that on average a daily number of 10–20 patients are being treated.
Activities of the university cardiology clinic
The University Cardiology Clinic and its entire potential participate in the realization of technical, health, educational and scientific activities. To be able to answer the great number of demands which activities of this kind make, the clinic is equipped with serious and qualified personnel.

The structure of the medical personnel
At the beginning of the Clinic’s work, in 1974, it began with eight doctors, one Master of Medical Science and two Habilitants. In the meantime, with the constant expansion of its activities and needs, the medical staff at the clinic began to increase, and simultaneously went through a process of technical development and re-education. Most of the doctors at the Clinic had experienced a formal technical stay in top European medical centres (Rotterdam, Vienna, London, Paris, Nurnberg, etc.).

Today the clinic has some 56 doctors, of whom 30 are subspecialist cardiologists, 23 specialist internists and 3 doctors on their way up to specialization. Twenty-two doctors from the clinic are Masters in Medical Science, while eleven doctors are Masters in Medical Science in the area of cardiology.

Nine doctors who work at the University Cardiology Clinic have the title Fellow of the European Society of Cardiology, as a sign of special commitment in the area of cardiology, not only in the their parent state, but at a European level, while four doctors have the Degree of European Cardiologists.

Professional activities
The doctors at the Cardiology Clinic were ideal initiators and actors in the realization of the idea of forming the MACEDONIAN CARDIOLOGY SECTION, formed in distant 1964, which then functioned within the framework of the Macedonian Medical Society (MMS), and in 1994 was transformed and grew into an independent professional association – the MACEDONIAN SOCIETY OF CARDIOLOGISTS, which since the year 1997 has been part of the European Society of Cardiology, with 157 members.

In the period of the long-term cooperation of this association and the Cardiology Society, the Cardiology Clinic has played its part in the organization of a large number of professional and scientific gathering, sections, congresses and symposiums, such as:

In the framework of the former Yugoslav Republic:
– 1980 to 1986, 1st – 4th Symposia of the Macedonian Society of Cardiologists;
– 1982, Symposium: "1st Yugoslavian Antiphlebitic Days";
– 1983, Symposium: "Most Recent Achievements in the Diagnostics and Therapy of Cardiovascular Diseases";
– 1984, Symposium: "News in Cardiology";
– 1985, 9th Congress of Yugoslav Cardiologists with international attendance;
– 1989, Yugoslav Symposium: "Asymptomatic ischaemia, acute myocardial infarction and sudden death";

After independence:
– 1991, 13th Congress of Macedonian Doctors with international attendance;
– 1996, 1st Macedonian Congress of Cardiology with international attendance;
– 2002, 2nd Macedonian Cardiology Congress with international attendance;

In the interest of improving healt care, and also the education and improvement of medical personnel at the clinic, it has also signed several bilateral agreements for cooperation with certain local and leading medical centres in the world, such as:
1. Agreement on scientific, professional and educational cooperation, education of professional personnel and health cooperation of THE INSTITUTE FOR CVD – CLINIC FOR CARDIOLOGY and ST. LUKE’S HOSPITAL, TEXAS HEART INSTITUTE – "AMBASSADOR" Programme.
2. Agreement on mutual educational, scientific and health activities between THE INSTITUTE FOR CVD – CLINIC FOR CARDIOLOGY and ST. EKATERINA HOSPITAL, MEDICAL FACULTY, SOFIJA (Prof. Dr. Cirkov).
3. Agreement for cooperation between THE INSTITUTE FOR CVD and THE CLINIC FOR CARDIOLOGY IN NURNBERG (Prof. W. Reiser).
4. Agreement for cooperation between THE INSTITUTE FOR CVD and THE MILITARY-MEDICAL ACADEMY, BELGRADE.
5. Agreement for cooperation between THE INSTITUTE FOR CVD and THE INSTITUTE FOR CVD, SREMSKA KAMENICA.
6. Agreement for cooperation between THE INSTITUTE FOR CVD and THE CLINIC FOR CARDIOVASCULAR SURGERY, DEDINJE, BELGRADE.

Educational activity
The Cardiology Clinic serves as an educational base for the Medical Faculty in Skopje in the framework of the Internal Medicine Department.
Within that cooperation the educational personnel and the spatial capacities as well are used by the Clinic to carry out tuition for the degree studies of students at the Medical, Stomatological and Pharmaceutical Faculties and the three-year studies for medical nurses, radiologists and physiotherapists.

The Clinic also serves as a scientific base for the realization of postgraduate tuition and education in the domain of the specializations of internal medicine and the internal sections from specializations in other areas (general medicine, infectology, etc.), and also subspecialization in the area of cardiology.

From its very beginning, the Cardiology Clinic has served as a tutorial basis for the realization of specialization in different areas of internal medicine, and the internal sections of specializations from different areas (general medicine, infectology etc.). The year 1999 saw the start of a new process of technical improvement caused by the organization of subspecialization in the area of cardiology. In the period to date, 54 doctors have achieved knowledge and skills as subspecialist cardiologists, of whom 34 are parent doctors, 13 are doctors working at medical centres in this country, and 7 are doctors from neighbouring countries, which means that this Institution is growing into a regional educational centre.

The Cardiology Clinic, as a moving force in the Macedonian Cardiological Society, organizes and participates in the continuing medical education (CME) of doctors across the country.

The year 1996 saw the beginning of the active work of the Echocardiography School through which many doctors from the parent institution have passed, especially from this republic.

The doctors who work in our institution also participate in the development and transfer of their knowledge and skills in the area of cardiology to doctors in the National Scientific Centre, the Cardiovascular Clinic in Astana, Kazakhstan, and in the General Hospital in Zadar.

Scientific activity
The doctors of the University Cardiology Clinic also engage in scientific activity, shown through many activities.

Since 1980, 33 doctors have been educated at the Cardiology Clinic and achieved the degree of Master in medical science in the area of cardiology, of whom 28 are doctors at the Cardiology Clinic and five are doctors at Medical Centres in this country (Gevgelija, Ohrid, Bitola). The first to graduate as M. Sc. from the Cardiology Clinic was Scientific Mentor Dr. Jelena Maksimovic-Pavlovic in 1982.

29 doctors have been educated at the Cardiology Clinic and achieved the degree of Doctor of Medical Science in the area of cardiology, of whom 25 doctors attend the Clinic for Cardiology and four doctors work in Medical Centres in this country (Ohrid, Tetovo, Bitola and the Paediatrics Clinic).

The first Doctor of Medical Science from the Cardiology Clinic, and on the Medical Faculty as well was Prof. Dr. Radovan Percinckovski, who defended his doctoral thesis Electropherogram on proteins, lipoproteins and glycoproteins in cardiovascular diseases at the Medical Faculty in Skopje in distant 1957.

Doctors from the University Cardiology Clinic engage in scientific activity, as is shown through their leadership and attendance at a large number of national and international projects such as:

National projects
Under the auspices of The Ministry for Education and Science of The Republic of Macedonia:

1. Early and late effects of streptokinase, under the leadership of Prof. Dr. Lazar Srbinovski, 1991–1994;
2. Clinical evaluation, follow-up, prognosis and quality of life after successful revascularization with aortocoronary by-pass surgery in CAD patients, under the leadership of Prof. Dr. Vladimir Borozanov and Prof. Dr. Ljubica Georgievskia-Ismail, 1999–2002;
3. Occurrence and progression of coronary artery disease in patients with diabetes mellitus type 2, under the leadership of Prof. Dr. Ljubica Georgievskia-Ismail and Prof. Dr. Vladimir Borozanov, 2003–2006;
4. Myocardial perfusion scintigraphy in diagnosis, risk stratification, evaluation of therapy and prognosis of cardiac diseases, under the leadership of Scientific Co-worker Dr. Jelena Maksimovic-Pavlovic, 2000–2003;
5. Acquired cardiac valvular diseases: evaluation, surgical treatment, prognosis and evaluation of postsurgical results: survival and preventive, under the co-leadership of Prof. Dr. Magdalena Zanteva-Naumovska and Prof. Dr. Elizabeta Srbinska-Kostovska, 2001–2004;

International projects
1. PAMI SENIOR study, 2000–2002. Moderators: Docent Dr. Saso Kedev, Prof. Dr. Borce Petrovski;
3. Euro Heart Survey on Diabetes and the Heart. 2003–2004. Moderators: Prof. Dr. Jelka Davceva-Pavlovksa and Prof. Dr. Ljubica Georgievska Ismail;


**Publications**

Many doctors’ clinical guides and activities from the domain of cardiology were produced in the year 2005, all of them based on evidence from leading institutions (Cochrane Library, European Society of Cardiology, and American College of Cardiology/American Heart association (ACC/AHA)).

Author: Prof. Dr. Ljubica Georgievska-Ismail.

Over the years a large number of volumes and monographs by cardiologists from the Cardiology Clinic have been published, and they serve as valuable study aids to the students, residents and doctors whose subspecialisation is in the field of cardiology.

1. **Vascular Doppler Sonography**, Slavco Tosev, 1999;
2. **Essential Arterial Hypertension**, Biljana Sidovska, 2000;
3. **Asymptomatic Myocardial Ischaemia**, Ljubica Georgievska-Ismail, 2000;
4. **Clinical Nuclear Cardiology**, Jelena Maksimovic-Pavlovic, 2000;
5. **Valve Replacement**, Elizabeta Srbinovska-Kostovska, 2001;
7. **Coronary Stress Test**, Jelka Davceva-Pavlovksa, 2003;
8. **Coronary Artery Disease: Prevention, Diagnosis and Treatment**, Ljubica Georgievska-Ismail, 2004;

In addition, professors from this institution are authors of sections on the field of cardiology in books on **Internal Medicine, Internal Propedeutics and the Practicum on Internal Propedeutics** in the Internal Medicine Department, editor Prof. Dr. Borce Petrovski, as well as in **Modern Diagnosis and Therapies in Medicine**, editor Prof. Dr. Lazar Lazarov, **Internal Medicine for Stomatologists**, co-author Prof. Dr. Lazar Lazarov, **Cardiology**, published in Belgrade, co-author Prof. Dr. Lazar Lazarov.

Doctors from the Cardiology Clinic have participated with their own professional scientific works in many domestic and foreign congresses and symposiums, as well as in medical professional and scientific journals. Eleven authors and thirty-three co-author doctors from the Cardiology Clinic are quoted in the medical database PUBMED with some thirty-one professional and scientific works in the area of cardiology.

**Резиме**

**УНИВЕРЗИТЕРСКА КЛИНИКА ЗА КАРДИОЛОГИЈА**

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До вселувањето во новот објект, Клиниката функционира со состав на објектот на Интерната клиника, организирана преку амбулантско-поликлинички дел и стационар со припашачки коронарни едници за интензивна нега и хемодинамска лабораторија, опремени за тоа време со најсовремена апаратура.

Денес Клиниката функционира преку две интегрални единици: Стационар, односно хоспитален дел кој се состои од единици за интензивна коронарна нега и одделение, купто четиринаесет на број со располагаачки 139 болнички легла и Дијагностички центар кој се состои од уређени амбуланта со дневна болница, општи и консултативни амбуланти, низ кои поминуваат просечно дневно по 300–350 пациенти и десет дијагностички лаборатории, во кои просечно дневно се вршат по 100-тина неинвазивни и 20–30 инвазивни дијагностички процедури.

Покрај здравствената дејност, Клиниката служи и како настанава база, односно лекарите како едукатори за студентите од Медицинскиот, Стоматолошкиот, Фармацијското фдуктет и Високата школа за медицински сестри и рентген техничари, како и на специјализираните и субспецијализираните по кардиологија. Исто така служи и како научна база за орга-
низирање и изведување на магистерски трудови и
dокторски тези од област на кардиологијата, со кои
се имаат стекнато не само лекарите вработени во
овава установа, но и во медицинските центри во зем-
јава и надвор од неа.
Лекарите од оваа установа покажуваат богата
публицистичка активност, со објавени преку десет
учебници, книги и монографии, како и оригинални
научни трудови во индексирани медицински списа-
нија.

Клучни зборови: Клиника за кардиологија.

Prof. Vladimir Borozanov

Prof. Magdalena Žanteva, Dean of the Medical Faculty in Skopje