



## Article

# Issues of providing high-tech medical care to patients with cardiovascular diseases living in remote regions of the republic

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**Abstract:** Diseases of the circulatory system impose a significant burden on healthcare systems and government budgets of any State. In this regard, diseases of the circulatory system have long been recognized by the world community as a problem that has reached pandemic proportions. Currently, due to the use of high-tech medical care (HMP) for patients with coronary heart disease and MI at different stages, mortality from this disease in many countries, including Uzbekistan, tends to decrease. However, the issues of routing patients with cardiovascular diseases living in remote regions of the republic to provide high-tech medical care still remain unresolved. The article presents research results based on surveys conducted among the population on the timeliness and quality of high-tech cardiological care.

**Keyword:** healthcare organization, cardiology, high-tech medical care, routing, cardiovascular diseases, risk factors

## Introduction

The high rate of scientific and technological progress, high rates of production growth and the rhythms of life observed since the second half of the XX century have created very serious problems affecting human health. The rapid introduction of the latest technical and chemical means and modern technologies into all spheres of human society has seriously aggravated the issue of effective measures to protect human health and life and the surrounding nature. Under the influence of the above factors, the structure of morbidity changes, new pathologies arise, which requires a deep analysis of the basic patterns of demographic processes and morbidity of the population, establishing their relationship with social and individual factors.

According to Global Health Assessments published by WHO, 7 of the 10 leading causes of death in the world are noncommunicable diseases. According to the World Health Statistics (WHO, 2020), the first position in the list of the ten leading causes of death has been occupied by cardiovascular diseases for 20 years. Studies have found that every year these ailments cause death in the EU countries in 42% of the total number of all deaths. The prevalence of these diseases varies within different limits depending on the country, and even the regions of a particular country [13].

Another urgent medical problem of modern healthcare is the burden of ischemic heart disease (IHD), which has been the leading cause of death in many countries since 2002, and the share of this disease in total mortality is increasing every year [6,8,9].

Diseases of the circulatory system impose a significant burden on the health systems and public budgets of any State. In the USA, this group of pathologies costs 219 billion US dollars annually (the cost of medical services, medicines and loss of DALY) [12]. According to experts, the treatment and

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prevention of DCS costs the EU economy 169 billion dollars per year (or an average of 372 euros per inhabitant) [13]. A study carried out by the National Medical Research Center for Preventive Medicine of the Ministry of Health of the Russian Federation showed that "the total economic damage of acute coronary syndrome in the Russian Federation for 1 year amounted to 74 billion rubles, which amounted to 0.2% of GDP, and the damage from all DCS also exceeds one trillion rubles in 1 year. (3% of the country's GDP) [3].

The total damage caused by NCDs to the economy of Uzbekistan amounted to 5.3 trillion Uzbek sums, which is equivalent to 2.7% of GDP in 2016, of which almost 45% is due to diseases of the cardiovascular system [11,14].

Thus, diseases of the circulatory system have long been recognized by the world community as a problem that has reached pandemic proportions. The increase in morbidity and mortality from CVS diseases is associated with both objective (aging of the population, socio-economic status, spontaneous urbanization, increased psycho-emotional tension, etc.) and subjective (diet, bad habits, physical inactivity, concomitant diseases, etc.) risk factors (RF). The fight against the burden of DCS requires a comprehensive approach from both government and health authorities, as well as from the population. Only a complex of preventive, organizational, methodological, educational, scientific, therapeutic and diagnostic measures aimed at preventing DCS, forming the population's need to maintain a healthy lifestyle, take care of their own health, as well as improving the quality and accessibility of cardiological care with the introduction of the most promising technologies for treating patients can reduce the severity of this problem.

Until recently, throughout the post-Soviet space, there was a traditional treatment regimen for patients with CVS diseases: polyclinic - hospital - rehabilitation, in emergency cases, emergency medical care. In recent years, more and more attention has been paid to modern methods of surgical treatment, which, according to a number of authors, justify themselves [1].

So, currently, due to the use of high-tech medical care (HMP) for patients with coronary heart disease and MI at different stages, mortality from this disease has decreased in many highly developed countries and ranges from 4 to 10% [19].

High-tech medical care (HMP) is a type of specialized medical care that includes the use of new complex and (or) unique treatment methods, as well as resource-intensive treatment methods with scientifically proven effectiveness, including cellular technologies, robotic technology, information technology and genetic engineering methods developed based on the achievements of medical science and related branches of science and techniques [1,18].

Patients with pathology of the cardiovascular system most often need the use of HMP. This type of care is used both at the stage of diagnosis and at the stages of treatment and prevention. Despite the fact that the introduction of numerous programs aimed at reducing the prevalence of this pathology in the global aspect has led to a slight decrease in mortality from CSD, the situation in many countries, including Uzbekistan, remains extremely serious, as noted in national and foreign publications [2,6,9-11,15-18].

#### **The purpose of the study**

To study the routing of patients with CVD diseases to provide HMP in the Navoi region and identify existing problems in routing patients to provide high-tech cardiological care.

#### **Materials and Methods**

To identify the level and quality of cardiological and cardiac surgical care in the regions, in particular in the Navoi region, the regional polyclinics of this region serving about 1001044 people, including children and adolescents, served as the basis for the study. To determine the "typicality" of the research base, the following indicators were evaluated:

- the level of morbidity in terms of outpatient care in general for all diseases;
- the incidence of diseases of the circulatory system;
- indicators of the number of visits to the polyclinic per 1000 population;
- indicators of the population's availability of doctors, including family doctors and cardiologists;

The above indicators were compared with the national average. To conduct the study, questionnaires were developed to interview patients with CVD diseases and doctors working in these health facilities. The unit of observation was a resident of the relevant district who applied for outpatient care during the study period (2015-2019 inclusive).

The main objects of observation were the morbidity of the population according to the data of outpatient care and, in particular, the incidence of diseases of the circulatory system, risk factors for diseases of the cardiovascular system, awareness of the issues of phasing and routing of cardiological, including high-tech care.

To study the spread of risk factors among the population that affect the formation of coronary heart disease and increased blood pressure, the respondents were selected by random sampling. The sample of 350 patients from among those who sought medical help at the polyclinic in 2015 included patients who had their blood pressure, body mass index - weight/height, cholesterol, glucose levels measured. The age of the examined persons is 18-55 years old.

The next object of the study were patients with cardiovascular diseases who underwent cardiac surgery over the past 3 years at the Navoi Regional Multidisciplinary Center. Among them were patients with various forms of coronary heart disease, life-threatening arrhythmias, and heart defects. The total number of such patients was 66 people. To identify problems of accessibility of cardiac surgery to patients and analyze patient satisfaction with the results of treatment, a questionnaire was conducted among the latter. A total of 1,500 adults from 18 to 80 years of age were interviewed. 510 questionnaires of the respondents were selected for further analysis, of which 81% are residents of the rural population, about 20% are residents of the urban population, 37.8% are men and 62.2% are women. We excluded the questionnaires of patients who did not complain about CVD. Among the respondents were patients who underwent one or more of the following interventions (implantation of an electrocardiostimulator, CABG, angioplasty or coronary artery stenting) at the Navoi Regional Multidisciplinary Medical Center, and who, after treatment, sought medical help to see a cardiologist or family doctor. The survey was anonymous.

To determine the level of awareness of the doctors themselves, in particular the primary health care, a survey was conducted ... of doctors selected by a random method.

In the process of conducting this study, we used the following research methods: - content analysis of legislative acts of the Republic of Uzbekistan, in particular concerning the field of health-care, reference information and scientific literature on the problem of "cardiovascular pathology", accessibility of the population to cardiac surgical care. The data from the administrative, statistical and medical documents of the medical institution were obtained by copying. To determine the long-term consequences of cardiac surgery, the method of direct supervision of the organization and management of the process of providing cardiac surgery and subsequent monitoring of the operated patient was used. The method of sociological survey of medical personnel and patients, mathematical, statistical and analytical methods were also used. Statistical processing and mathematical analysis of the data obtained included determining the sample size, using methods for calculating averages and relative values, calculating the mean square deviation, determining the reliability of averages and indicators, using the method of comparing averages and relative values, and compiling predictive tables.

### **Results**

Despite the ongoing preventive, organizational, and therapeutic measures to reduce CVD in the republic, there is a tendency to increase a number of indicators characterizing cardiological health. Apparently, this is due to various "psychosocial barriers" at different levels. This is how patients' unwillingness to comply with medical recommendations is very often revealed; doctors' lack of patient education skills; focus on therapeutic rather than preventive effects. At the level of the health organization system, this is the inadequacy of wellness programs, often the lack of continuity between medical and preventive institutions at various levels.

In the Republic of Uzbekistan, in connection with health care reforms, the primary health care unit has received priority development, which is due to the fact that this service is designed to provide a guaranteed minimum of medical, psychological and social care, accessibility of medical and social services, comprehensive services, coordination with other health services, continuity of monitoring of patient management in various health facilities, awareness of patients about their condition, treatment methods, expected results, etc. Consequently, the efficiency and quality of the entire health care system depends on the state of this service.

At the same time, it should be noted that various types of cardiac surgery play an important role in reducing mortality from cardiovascular diseases. According to the literature, it can be concluded

that the level and quality of cardiac surgery in different countries and even in different regions of the same country vary significantly. In many countries, the level of use of cardiac surgical treatments does not meet the needs for this care and the reason for this is the lack of adequate mechanisms for access to expensive treatments.

In Uzbekistan, in recent years, more than half of all surgical interventions in Republican centers are high-tech, complex and unique treatment methods have been introduced into practice. Until recently, in the republic, high-tech specialized assistance in all areas was provided only in specialized centers located in Tashkent. This caused a number of difficulties in obtaining timely highly qualified specialized assistance to the population living in remote regions of the republic, such as the inability to diagnose a disease requiring surgery early, wasting time and money on travel, accommodation, long queues for surgery. In this regard, many patients had to travel to foreign clinics to receive appropriate specialized care. Taking into account these circumstances and factors, the Decree of the President of the Republic of Uzbekistan "On measures for the further development of specialized medical care for the population of the Republic of Uzbekistan for 2017-2021" was adopted [7]. In accordance with this Resolution, the provision of HMC is provided not only at the republican, but also at the regional levels. This was provided for the further formation of an effective system of specialized medical care that meets modern requirements, improvement of measures for the prevention and early detection of diseases, cardinal improvement of the effectiveness, quality and accessibility of highly qualified specialized medical care to the population, including in the regions. The Concept of development of the healthcare system of the Republic of Uzbekistan for 2019-2025 provides for bringing the introduction of high technologies of diagnosis and treatment in the provision of specialized medical care to the population in all medical organizations to 50%.

Despite the fact that the level of a number of diseases, including diseases of cardiovascular pathology in the Navoi region is relatively low, however, the problem of providing highly qualified specialized care is still relevant.

Every year, about 15-16 thousand diseases of the cardiovascular system are detected for the first time among the population of Navoi region. It should be noted that among women this pathology is registered relatively more often (1.2 times) than among men. Of the total number of registered diseases of the cardiovascular system, 1.3-2.4% occur in children aged 0-14 years (Fig.1). It should be remembered that despite the relatively low level of primary morbidity of the circulatory organs among children, most of these diseases are due to congenital heart diseases, which in many cases require urgent surgical care. In the structure of birth defects among children as a whole, almost 1/3 of it is occupied by congenital heart defects and circulatory system (CHD), followed by multiple birth defects, chromosomal

Monitoring of congenital malformations is one of the preventive measures that will make it possible to determine the population frequencies of congenital malformations, including congenital heart defects, and assess the impact on them of massive government programs for primary and secondary prevention.

One of the leading directions in the field of combating CVD is the development and improvement of HMC. The level of development of HMC in any direction, including cardiology, is influenced by internal (micro) and external (macro) factors of the field of health care, which are interrelated, therefore, a change in one factor affects others.

It should be noted that in remote regions of the republic, the mortality rate of patients with cardiological pathology is mostly associated with the prevalence and intensity of risk factors for CVD, lack of treatment effectiveness and low access to high-quality medical care, in particular high-tech. It is these factors that must be taken into account in the planning and implementation of various programs to reduce CVD.

Along with objective factors, a subjective factor plays an important role in the development of HMC - the awareness of medical personnel and the attitude of patients to the quality of services provided in the field of HMC.

In recent years, positive changes in the lifestyle and medical behavior of the population in the republic as a whole can be noted as a result of large-scale work on the formation of a healthy lifestyle. Reducing CVD risk factors, as well as the development of scientific and technological progress in the field of cardiology and the introduction of high-tech medical care (HMC) into healthcare practice

at all stages of diagnosis, treatment and rehabilitation of patients may further lead to a decrease or stabilization of the mortality rate from CVD.

The transition to the organization of primary health care based on the principle of a family doctor leads to increased accessibility, improved quality, cost-effectiveness and continuity in providing medical care to the population, efficient use of resources, increased use of inpatient replacement technologies and types of medical care, and an increase in outpatient care. As you know, the family doctor and nursing nurses are currently the dominant figures in the primary health care system. It is they who are entrusted with the function of raising public awareness of the main issues of risk factors and symptoms of diseases of the cardiovascular system, which would contribute to the early detection of patients with CVD.

In the Decree of the President of the Republic of Uzbekistan No.DP-5590 07.12.2018 "On comprehensive measures to radically improve the health care system of the Republic of Uzbekistan" it was noted that the health care system should be constantly improved, starting with the primary health care, it is necessary to increase the availability of both emergency and specialized, including high-tech medical care in the field. The decree notes that the low efficiency of work on the prevention and early detection of diseases, patronage and formation of a healthy lifestyle is the reason for the increase in citizens' requests for specialized medical care. It is emphasized that there is very low continuity between the various levels and stages of medical care to the population, there is almost no restorative treatment and rehabilitation of patients with NCDs, including CVD.

The main role in the provision of HMC is played by the Republican specialized Scientific and practical Medical Centers (RSSPMC) of emergency and emergency care, surgery, cardiology and branches of these centers in the regions. In accordance with the Decree of the President of the Republic of Uzbekistan No.DP-3071 dated 06/20/2017. "On measures for the further development of specialized medical care for the population of the Republic of Uzbekistan for 2017-2021" all centers are equipped with modern equipment and staffed with highly qualified doctors and secondary medical personnel. RSSPMC are the main coordinating, therapeutic, scientific, organizational and methodological organizations that regulate the provision of specialized care throughout the country. In the regions, multidisciplinary centers established by Decree of the Cabinet of Ministers of the Republic of Uzbekistan No. 48 dated March 18, 2008, are engaged in providing HMC in the profile "cardiovascular surgery". The Center is financed in equal shares from the state budget and paid medical and non-medical services. Since 2018 Methodological branches of the Republican Specialized Scientific and Practical Medical Center of Cardiology have been established on the basis of the centers, the introduction of noninvasive CVS examination methods for early detection of diseases or risk factors of their development, as well as for evaluating preventive and therapeutic interventions, in particular surgical ones, has begun. Currently, many regional multidisciplinary medical centers have facilities for conducting not only standard examinations such as ECG. Echocardiography, daily ECG monitoring, blood pressure, daily pulse oximetry, but also angiography, coronography and a number of other studies that identify diseases with and without clinical manifestations, signs of early changes in cardiac structures (heart muscle valves), assess vascular stiffness, degree of narrowing of arteries, diagnose life-threatening cardiac arrhythmias. A number of centers have departments of interventional cardiology, cardiac surgery, radiography and radiology. The department of interventional Cardiology performs angiography, stenting, correction of heart defects, angiographic studies of other organs, including CVD.

We have analyzed the satisfaction of the population with high-tech methods of diagnosis, treatment and rehabilitation and the awareness of the latter in matters of obtaining HMC in CVD, in particular, conducting coronography, operations or other interventions, the stages of their treatment (routing) to the OMPC or RSNPC. The results obtained allowed us to conclude that, unfortunately, the majority of the population, even those suffering from CVD, do not know about the possibilities of the regional health care facility. Thus, 60% of the CVD patients surveyed who received treatment at the Navoi Regional multidisciplinary Medical Center, who were registered at dispensaries in family clinics, did not have a clear idea of the stages of cardiological care and the opportunity to undergo in-depth examination in their region. Only 1/3 replied that they were asked to undergo an examination in the region, but after a long period after the onset of the disease, an average of  $8.6 \pm 2.0$  months. 10% of the respondents, after the deterioration of their health and the lack of effectiveness of

therapeutic treatment in their territorial health facility, without contacting regional health facilities, came to the capital of the republic and consulted cardiologists at specialized scientific and practical centers of cardiology, surgery or other consulting medical centers of a private nature.

The reason for this is that the population of remote regions, as well as most primary care doctors, do not have a complete understanding of the routing of patients with CVD.

The survey showed that the majority of doctors (45%) are themselves interested in obtaining reliable information about the issues of providing HMC. Of the respondents, 18% have accurate information about HMC, 30% know, but doubt their knowledge, and 52% do not know about the procedure for providing HMC and the possibility of obtaining it in their region. Only 15% rated their level of awareness about the possibilities of providing HMC in their region as high, more than half 54% as average and 1/3 consider their level of awareness low.

A very low percentage of the surveyed doctors gave the correct answer about the procedure for providing HMC. 30% of respondents correctly answered the question of what HMC is, but the answer was far from complete, almost 1/3 of doctors could not answer this question. 45% of doctors know who and in what cases it turns out to be free of charge. A larger percentage (52%) of respondents were able to correctly answer the question of where they can get a referral for the provision of HMC.

During the survey, we also drew attention to this point whether the doctors themselves know about the necessary package of documents to present to the commission for the issuance of these referrals, because if the doctor knows the answer to this question, he can competently explain to the patient what needs to be prepared before contacting the relevant departments that issue referrals for the provision of HMC. So, among the doctors we interviewed, only a fifth were able to give a complete and correct answer about the package of documents for receiving a referral, the rest had the wrong answer (20%).

According to the data obtained, it can be concluded that the level of awareness of doctors about the procedure for providing HMC, its stages, and the necessary documents for submission to the commission is relatively low. When asked why such a low level of knowledge in the provision of HMC, respondents explain the lack of information about HMC, ignorance and unwillingness to familiarize themselves with the regulatory documents on HMC. A comparative analysis of the knowledge of primary care doctors, inpatient and specialized multidisciplinary centers revealed an interesting pattern. The level of awareness of hospital doctors compared to primary care doctors was almost 1.3 times higher, however, compared to doctors of specialized centers, their knowledge was much lower (2 times).

### **Discussion:**

Thus, the level of awareness of doctors depends not only on the competence of the doctor himself, but also on the specialty and place of work. In the course of their activities, doctors of specialized centers encounter various regulatory legal documents, take part in seminars and conferences dedicated to the provision of HMC. In this regard, doctors working in specialized centers are much more knowledgeable about the provision of HMC, regulatory documents, and the procedure for selecting and referring patients to receive HMC. From this it can be concluded that primary care doctors and hospitals need to regularly conduct classes, seminars, online lectures, conferences on regulatory documents for the provision of HMC. One of the main methods of training doctors on HMC issues should be self-education - independent study of educational and methodological literature, periodicals, articles in scientific journals, the results of scientific research.

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