



Substantiation of the model of a university hospital, scientific-methodological and organizational

Substanciación del modelo de un hospital universitario, bases científico-metodológicas y organizativas de su funcionamiento

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Received: 30/09/2017 • Approved: 05/10/2017

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ABSTRACT:

The paper studies the operation of a university hospital, its scientific-methodological and organizational bases. It was shown that the establishment of a university hospital should include organizational transformations of treatment, diagnostic, scientific, and educational processes. It is necessary to establish a university advisory group, to establish a contractual basis of salaries, to hold interdisciplinary consultations, to take a comprehensive approach to training medical specialists, to organize workshops, lectures, and conferences, and to create a new structure of the state examination. The paper pays special attention to the hospital management system, which implies focusing on patient, reorganizing management, heightening interest of personnel, taking the process approach, ensuring managerial consistency, continuous optimization of practice, fact-based decision-making, and effective partnership. The paper substantiates necessity of economic analysis during the operation of a university hospital. The analysis is based on the indicators of the immediate and ultimate result with regard to the quality and efficiency of medical aid, adequacy of the medical service, efficiency of financial investments, and labor costs. This model of operation helps develop the

RESUMEN:

El trabajo estudia el funcionamiento de un hospital universitario, sus bases científico-metodológicas y organizativas. Se demostró que el establecimiento de un hospital universitario debe incluir transformaciones organizativas de los procesos de tratamiento, diagnóstico, científico y educativo. Es necesario establecer un grupo consultivo universitario, establecer una base contractual de salarios, celebrar consultas interdisciplinarias, adoptar un enfoque integral de formación de especialistas médicos, organizar talleres, conferencias y conferencias y crear una nueva estructura de los examen estatal. El documento presta especial atención al sistema de gestión hospitalaria, lo que implica centrarse en el paciente, reorganizar la gestión, aumentar el interés del personal, adoptar el enfoque de proceso, garantizar la coherencia gerencial, la optimización continua de la práctica, la toma de decisiones basada en hechos y la asociación efectiva. El documento justifica la necesidad del análisis económico durante el funcionamiento de un hospital universitario. El análisis se basa en los indicadores del resultado inmediato y definitivo en cuanto a la calidad y eficiencia de la asistencia médica, la adecuación del servicio médico, la eficiencia de las inversiones financieras y los

university hospital as a profitable enterprise and implies the analysis of risk management components – the risk for patients, the risk for the personnel, and the risk for the organization.

Keywords: university hospital; operation; organizational bases; quality management; model.

costos laborales. Este modelo de operación ayuda a desarrollar el hospital universitario como una empresa rentable e implica el análisis de los componentes de la gestión del riesgo: el riesgo para los pacientes, el riesgo para el personal y el riesgo para la organización.

Palabras clave: Hospital universitario, Bases organizacionales, Gestión de la Calidad, Modelo

1. Introduction

Science, medicine, and medical studies are interrelated. A university hospital provides a unique opportunity to unite several processes in one healthcare institution: medical aid of any complexity and training of professional staff. This institution combines state-of-the-art equipment, best models of rational management, funding, and quality control with regard to medical aid (Korsunsky, Kashchenko & Lazarev, 2015). Nowadays, those who wish to establish a university hospital face many problems. State-owned higher educational institutions have clinical sites in institutions that are community property. However, university hospitals should be established by central authorities, local self-government agencies, and higher educational institutions and research centers under the Ministry of Healthcare and the Academy of Medical Sciences. Therefore, it is necessary to agree upon the form of ownership of university hospitals. It is also necessary to avoid problems when transferring community-owned institutions into state ownership (with a view to establishing university hospitals). The reform of the medical education system is impossible without reforming the general system of healthcare (Gayfullin, Yagudin & Guslyakova, 2012). The lack of a legislative framework is a considerable obstacle for the establishment of university hospitals in the country – it prevents people from using marketing studies and obtaining reliable statistical data to improve managerial decision with the use of management laws. Therefore, developing and establishing university hospitals as a form of medical service that guarantees the best efficiency of practice at minimal costs and provides high-quality medical aid is a relevant healthcare problem in Kazakhstan.

The purpose of the research is to describe the scientific-methodological and organizational bases of operation of university hospitals.

2. Main part

It should first be noted that the intention to establish a university hospital includes following aspects of medical aid and education (Al-Amin, 2012; Fortier, Perron & Fountain, 2015):

1. To make use of scientific and technological achievements in diagnostics and treatment.
2. To provide patients with innovative and skilled medical aid.
3. To improve the quality of medical records.
4. To tackle flaws in medical aid.
5. To make use of the results of R&D and clinical practice in the educational process.
6. To provide practice-oriented education, both pregraduate and postgraduate.

The above components can be realized by accomplishing the following objectives:

1. To guarantee skilled diagnostics and treatment that take into account scientific studies and implement cutting-edge technologies in medical aid with the help of the academic staff of the university.
2. To develop and implement innovative diagnostic and treatment techniques.
3. To improve the quality of medical aid by focusing on the practical training of students and encouraging practitioners to participate in the learning process.

4. To improve the forms and methods of learning by using the potential of the academic staff efficiently in accordance with the need for high-quality service in healthcare.
5. To create conditions for the pedagogical process and the organization thereof, as well as for the practical training of skilled personnel.

One of the functions of a university hospital consists in providing specialized, skilled, and emergency medical aid to the population and providing advisory and diagnostic services to other treatment and preventive institutions (Rogova 2012). This requires using modern methods of treatment, diagnostics, and medical rehabilitation, special state-of-the-art equipment for minimally invasive surgeries, and skilled personnel.

A university hospital also gives new opportunities to carry out researches that comply with world standards, to implement advanced technologies in practice, and new possibilities for international cooperation between scientific and healthcare institutions (university hospitals) and specialized European associations (Lega 2008; Scherstén, 1993). Each university hospital should combine scientific-educational and treatment-diagnostic practice. The organizational bases of operation of these two areas are presented in Table 1.

Table 1. Forms of interaction between a medical university and a healthcare institution

Treatment and diagnostics	Science and education
Establishment of a university advisory group. Consultations from department employees. Contractual basis of the salary. Department employees attend to outpatients. Multidisciplinary consultations. Organizational innovations.	Comprehensive approach to learning. Workshops, lectures, and conferences. Procurement of learning equipment. Formation of a practice-oriented examination in respective disciplines. Actual clinical cases in practical problems.

Treatment and diagnostics. Firstly, a university advisory group of single-discipline specialists should be established to provide skilled and specialized medical aid to complex patients. Secondly, the effectiveness of clinical consultations of department employees should be tested and assessed. Thirdly, it is necessary to consider recruiting academic staff as single-discipline advisors in various specialties as hospital employees, and to consider the possibility of salaries for medical advisors on a contractual basis. Chief university and hospital specialists should also attend to outpatients.

This will enable improving the quality of specialized skilled outpatient medical aid and making it more accessible. Multidisciplinary consultations with academic staff, chief specialists from the hospital, employees of other higher educational institutions and R&D centers are recommended for the development of diagnostics and treatment tactics for the most complex patients.

Using advanced laboratory and diagnostic resources of the university to examine patients with serious diagnoses is recommended to expand the diagnostic capabilities of the hospital. In terms of organizational innovations, it is worth noting that the optimization of cooperation between the university and the hospital and the improvement of the quality of medical service requires preparing medical records and tackling flaws in diagnostics and treatment. In addition, the director of the university hospital should be on the medical and expert panel of a healthcare and preventive institution to optimize managerial decisions (Kornilov, Filippenko & Poveikin, 2010; Petrov, 2006).

Education. This primarily concerns bilateral cooperation. Therefore, contractual work at the

university hospital is available not only to the department employees as advisors, but also to hospital employees as part-time department assistants. At that, the participation in the educational process of the university hospital of specialists that are most experienced will help organize a comprehensive approach to teaching clinical disciplines, and develop practical experience and skills that are necessary for diagnostics and treatment at a primary link of healthcare.

Healthcare experience in developed countries shows that medical education should be based on the following components: training and improvement of practical skills, continuity of education in accordance with the principles of evidence-based medicine. This model of education can be organized on the basis of a university hospital.

When organizing a university hospital, it is necessary to consider the training of skills of medical procedures, which can raise the issue of state-of-the-art simulators and preparation of the classroom where the comprehensive training of special skills will take place. The classroom should be intended not only for students and for upgrading the skills of doctors and nursing staff, but also for other categories of the population, for instance, volunteers.

Holding workshops, lectures, scientific, practical, medical, and anatomic-pathological conferences is also effective. It is necessary to form a new structure of the state examination for such disciplines as "internal medicine", "surgery", "pediatrics", and "obstetrics and gynecology". At that, the focus should be on the practical part of the exit examination – "at the patient's bedside". The updated structure of the examination should require practical skills, clinical thinking, and experience of independent work.

Furthermore, the clinical experience of the healthcare institution, based on the analysis of medical records of certain patients, should be used when preparing practical assignments. Computer technologies enable showing images and videos, as well as results of functional, laboratory, and instrumental examinations.

The main operating principle of a university hospital is the so-called "university triad" – close interrelation of specialized medical aid, learning process, and researches (Copley, Allison & Hill, 2007). Therefore, the medical aid at such an institution should be at a much higher level.

The organizational principle of the work is territorial, i.e. university hospitals serve the part of the population that is "assigned" to them. In addition, university hospitals follow the principle of continuous professional education (from pregraduate to postgraduate).

Many organizational issues related to the establishment of university hospitals remain unsolved nowadays. In particular, current methods of hospital management that are required for high-quality management of a medical institution are a model of continuous quality improvement, which is adapted to the general healthcare system.

This model is based on 14 managerial principles (Potatova, Sabirov & Amirov 2011; Uyba, Chernyshev & Pushkarev 2012):

- 1) consistent goal of the manager;
- 2) replacement of conventional management techniques;
- 3) abandoning of mass control;
- 4) prioritization of high-quality equipment;
- 5) optimization of each managerial process;
- 6) continuous medical education and personnel training;
- 7) elimination of team management, establishment of "leadership";
- 8) reevaluation of relationships between the personnel and the manager, abandoning of such methods of influence on employees as punishment and fear;

- 9) trust-based cooperation between departments;
- 10) abandoning of slogans and appeals;
- 11) use of scientific analysis and results of working experience of specialists to develop standards of hospital management and medical aid, abandoning of unreasonable standards;
- 12) actual encouragement of university hospital employees;
- 13) stimulation of employees to upgrade their skills;
- 14) prioritization of upgrading the operating quality of the university hospital.

Based on these principles, the first family of ISO 9000 standards was developed in 1987, which was revised several times (second edition – in 1994, third edition – in 2000, and then in 2005, 2008, and 2009). ISO standards are quality management system standards, including hospital management, that are a structure and set of managerial principles that provide an effective approach to management organization to help ensure that the customers' needs are met (Vozny, Sannikov & Zakharov, 2011; Gadaborshev & Levkevich, 2012).

The main goal of the ISO-based quality management system is to meet the needs and expectations of all interested parties: customers, service or resource providers, the public, and the government.

In terms of establishing university hospitals, ISO principles should:

- 1) improve the quality of medical services, while also improving the performance and efficiency of medical aid and cutting the cost of said aid;
- 2) heighten the interest of the personnel in the quality of services, which will create a psychological environment that focuses hospital employees on long-term prospects by enhancing the prestige of the job;
- 3) ensure that quality management systems and treatment-diagnostic measures comply with international standards and recommendations;
- 4) strengthen the credibility of the management and improve the image of the hospital among the population and the professional community.

Table 2. ISO standards – the main principles of quality management

<i>Focus on the patient</i>	Subjective assessment of the quality of medical services by the patient.
<i>Management reorganization</i>	Leadership of the manager. Autonomy. Controlling body.
<i>Interest of personnel</i>	Assessment of needs and motivation. Involvement of all hospital employees in active practice.
<i>Process approach</i>	Planning, organization, control, and systems analysis. Comprehensive expert assessment system.

<i>Consistent management</i>	Principles of hospital management.
<i>Continuous optimization</i>	Continuous improvement of medical service quality. Implementation of innovative diagnostic and treatment techniques. Research papers. Involvement of the public.
<i>Reasonable decision-making</i>	Gathering, processing, and analysis of information. Monitoring of patients' satisfaction. Risk management.
<i>Partnership</i>	Thorough selection of providers of equipment, drugs, etc.

Focus on the patient. Nowadays, medical institutions have to provide high-quality well-organized medical service in order to survive (Gordon, Aydam & Hamm, 2015). Focus on the patient is a top-priority at a university hospital. This requires changing the stereotype that formed in soviet times and following the principle of "what can we do for the patient", rather than "what can the patient do for us". The main impetus here is the abandoning of estimate-based funding and the understanding of the fact that the presence of patients is an indicator that the university hospital is working.

Management reorganization. It is necessary to change the management strategy when organizing a university hospital and choose one that differs from the conventional management strategy of a healthcare institution. Management should be autonomous and have its own panel of experts. The management of the university hospital should determine the priorities in its practice (including the provision of medical aid, involvement of additional potential, procurement of necessary equipment, and allocation of the budget) (Knowlton, Chackungal & Dahn 2013). German university hospitals have a board that includes the chair, the dean of the medical faculty, and the director of the hospital. The work of the board is controlled by a supervisory board (Semnani, Mohebbi & Shalipoor, 2014).

Interest of personnel. The employees of university hospitals are the main working unit during the provision of medical aid. Therefore, determining their needs and plans for the future, desire of professional development, and satisfaction with their job is a priority. This will help better involve university hospital employees in learning, treatment, and diagnostics, and will improve work motivation. To do so, university hospitals should plan and organize professional training with employees of specialized departments.

Process approach. The work of university hospitals should be based on systems analysis. This requires a comprehensive system of expert assessment. It is necessary to form an expert group that will include chief specialists of the university hospital, including employees of specialized departments. The expert group will conduct expert assessments, coordinate and adopt regulatory documents of the standardization system (hospital standards), correct deviations, and control the quality of medical aid.

It is also necessary to conduct patient surveys with specially drafted questionnaires, analyze complaints, etc. In case of complaints, it is necessary to analyze the situation objectively and take appropriate measures immediately.

Systems approach to managing the quality of medical aid. Medical aid is an open dynamic system. The systems approach to the work of a university hospital should include the following

aspects: the determination of all processes taking place at the hospital, the determination of interrelation and interaction between these processes, the determination of the goals of these processes, and the coordination of these goals with the goals of the hospital. This should be followed up by the implementation of hospital management principles by ensuring continuous management and optimization.

Continuous optimization. Improving the quality of medical service at a university hospital is impossible without continuous improvement. New efficient diagnostic and treatment techniques should be implemented to improve the quality of medical service and meet the needs of patients. Joint activity agreements should be signed with the academic staff and chief specialists in this field, including foreign specialists. Such integration should result in high-technology surgeries and procedures at the university hospital.

Results that are obtained during hospital work should be published in specialized journals and periodicals. It is necessary to advertise and involve the public in the work of the "patient school" in the main fields of work of the university hospital. Classes in such schools should be given by both department employees and the academic staff of the medical university. Themed videos should be used to make classes more accessible; in addition, patients should be handed memo pamphlets for each topic. These pamphlets should be designed by university hospital employees.

Fact-based decision-making. Constant gathering, processing, and analysis of objective information regarding the work of the institution and the quality of medical aid is necessary to confirm the efficient work of the university hospital and the satisfaction of patients, users of medical services, and other interested parties. This requires using statistical control methods with the involvement (on a contractual basis) of a certified expert on the assessment of quality management systems. This expert will inspect regularly how the system works and hold workshops regarding quality for university hospital employees.

It is necessary to aim for continuous monitoring of patients' satisfaction with medical services, in particular, the monitoring of risks of medical errors during diagnostics and treatment. Results of the monitoring should be used to make managerial decisions, aimed at improving the organization of medical aid and the quality of medical services (Madsen, Lough & Lim, 2015).

Medical services are associated with the possibility of risks. Therefore, special attention should be paid to organizing the risk management system. Internal risks are typical for medical services; it is not always possible to predict and prevent these risks. Risks in the practice of university hospitals imply the possibility of adverse consequences of medical intervention and possible consequent harm (Reynolds, 2011). Patients usually think that the adverse outcome is a consequence of errors on the part of the medical worker or of the level of organization of medical aid at a specific hospital.

When managing risks at a university hospital, it is necessary to follow three main strategies: risk prevention, prevention or minimization of losses in case of risk occurrence, and risk transference by insurance of the professional activity of the university hospital. Of course, prevention should be prioritized when managing risks (Vyalkov, 2004).

Mutually beneficial partnership. The selection of suppliers of medical equipment, medication, consumables, food, etc. for the university hospital includes the analysis and constant control of quality and the range of purchased goods, convenience and observance of supply terms, reliability of the supplier, observance of financial discipline, etc. It is also necessary to take into account the requests of the medical personnel and the needs of patients.

Thus, the competitiveness and leadership of the university hospital in the healthcare system can be achieved by improving current methods of hospital management.

The working principles of the "National Scientific Medical Center" JSC of the Ministry of Healthcare of the Republic of Kazakhstan (NSMC) can be regarded as a "model" of a university hospital. A quality management system that complies with ISO standards has been successfully maintained at this institution in recent years.

The NSMC implemented seven projects in 2011-2012.

Project No. 1 – the analysis of the work of the cardiology and cardiac surgery service and their hospital management in supervised regions of Kazakhstan.

Project No. 2 – implementation of telemedicine technologies.

Project No. 3 – focus on information security and the development of a management system in this field.

Project No. 4 – improvement of the management system in the corporate and social aspects.

Project No. 5 – “Virtual computed-tomographic colonoscopy”.

Project No. 6 – innovative technologies of HIFU tumor therapy.

Project No. 7 – implementation of electronic document control.

The implementation of these projects was preceded by the setting of goals and tasks, appointment of project managers, analysis of resources required to implement the projects, selection of contractors, indicators of quality of performance of intermediate tasks, criteria of project efficiency, and profitability.

External assessment of these projects was carried out in 2012. The results of the implemented improvement projects were assessed by European assessors by conceptual approaches and nine criteria. The achievements of the NSMC in the field of management and innovative technologies were assessed at the “Recognized for Excellence 5-Star” level.

Funding is a relevant issue for the operation of a university hospital. University hospitals are currently funded from the state budget, which is not in its best condition, given the current economic situation. Consequently, hospitals lack funds not only to purchase state-of-the-art equipment, but also to provide a full scope of free medical aid. Therefore, it is necessary to attract other sources of funding (Vyalkov & Kucherenko, 2006).

For example, university hospitals in Germany are funded through six sources (the budget, general mandatory funding, university funds, special foundations, premiums of academic medicine, etc.); in Austria and France, they are funded through three sources; in Sweden – through four.

Modern university hospitals provide top-notch medical aid with state-of-the-art equipment and skilled personnel, and advance science. Changes in the principles of healthcare funding in Russia give medical institutions, including university hospitals, a real opportunity to make profit, granted healthy competition for patients (and, consequently, the funds that come with these patients) (Gayfullin, Yagudin & Guslyakova, 2012; Petrov 2006). In such conditions, university hospitals can become the best medical institutions in their respective regions.

Multichannel funding (internal, insurance, state funds, etc.) will facilitate this process.

In theory, the money that the university earns for teaching foreign students could be used by the university hospitals to purchase learning equipment. Advanced equipment should be removed from state ownership, which requires active practical implementation of socially responsible partnership (for instance, with the Center of computed tomography, magnetic resonance imaging, laboratory of liquid-based cytology, angiography operating rooms, and other privately owned projects). These projects may have to be implemented on a long-term basis.

Such partnership can “remove” corruption from treatment and diagnostics, make transparent the pricing of medical services, make state-of-the-art equipment more accessible to residents, postgraduate students, interns, and employees of the university hospital, help organize training classes at partner institutions and control the quality of their medical services, and create new jobs for the best specialists. It will also provide fair wages for medical workers, which is

especially relevant nowadays.

Understanding that it is impossible to establish university hospitals all across the country by one and the same template is also crucial. Their organization should take into account the features and needs of each specific region. Then the hospitals will integrate seamlessly into the medical space, create health competition, and ultimately find their niche in said space (overlapping functions are unnecessary for both medicine and marketing).

Granting university hospitals the status of a legal entity is a disputed issue with scientists having contradicting opinions (this may be caused by specific circumstances that emerged in each region of the country through traditions). An established legal formula for estimating the cost of medical services is lacking. University hospitals are able and ready to make profit; however, it is unclear who will price the medical services.

Therefore, developing methodological approaches to assessing the efficiency of operation of university hospitals is relevant nowadays, since it is necessary to assess the extent of achievement of publicly important results and the efficiency of the state policy in terms of healthcare reorganization.

The result-oriented budgeting implies “an allocation of budget funds to the managers of budget funds and (or) their implemented budgetary programs, with regard to or depending on the achievement of concrete results (provision of services)”.

The budget fund management costs should conform to the results of the work of these managers. In order to assess the efficiency of operation of a university hospital, it is necessary to analyze the indicators of immediate result, which consist in the amount and quality of provided medical services, with a view to achieving a socially significant effect (Campbell, Restrepo & Mackay, 2014).

The assessment of the operation should be based on the determination and analysis of indicators (Vyalkov & Kucherenko, 2006).

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Revista ESPACIOS. ISSN 0798 1015
Vol. 38 (Nº 48) Year 2017
Indexed in Google Schollar

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