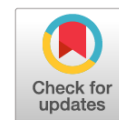


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Organization and efficiency assessment of day surgery units

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ABSTRACT

BACKGROUND: A key priority in the development of Russia's healthcare system is primary medical and social care modernization, transitioning to resource-efficient technologies and care models without compromising service quality. Since the 20th century, ambulatory surgical care has been progressing. However, existing efficiency indicators, including economic metrics, do not provide an adequate basis for comparison with 24-hour inpatient facilities.

MATERIALS AND METHODS: This study analyzed the treatment of 35,000 patients at the Department of Ambulatory and Polyclinic Care of the S.M. Kirov Military Medical Academy (2005–2024), alongside statistical data from the annual 2023 Health Care in Russia report, materials from six congresses of ambulatory surgeons, and scientific publications. The organizational structure, specialization, and statistical performance indicators of day surgery units throughout the 21st century were examined.

RESULTS: The number of beds in hospital-based day surgery units between 2010 and 2019 increased by 14.4%, whereas those in outpatient clinics increased by 17.1%. However, the average bed occupancy rate in hospital-based day surgery units decreased from 293 to 287 days and from 322 to 309 days in outpatient-based day hospitals. The average occupancy of 24-hour inpatient hospital beds was 310–319 days. These data indicate the inefficient utilization of day hospital beds due to their underuse, resulting in low economic efficiency.

CONCLUSIONS: The inability to accurately assess the efficiency of day surgery units is a crucial issue. Establishing standardized performance indicators, defining the status of day hospital beds, and increasing their turnover rate are required to address this challenge. Direct funding for all day hospitals should be implemented, and the cost of completed treatment cases should be assessed based on a unified base tariff, regardless of the type of medical institution providing care.

Keywords: ambulatory surgical care; day surgery unit; performance indicators of day hospitals; bed turnover rate; average bed occupancy; efficiency of day surgery units.

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Организация работы и оценка эффективности деятельности дневного хирургического стационара

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АННОТАЦИЯ

Введение. Одной из ключевых задач развития системы здравоохранения России является модернизация первичной медико-социальной помощи, переход на ресурсосберегающие технологии и формы без ущерба качеству ее оказания. Стационарозамещающие формы оказания хирургической помощи активно развиваются с XX в., однако применяемые к таким формам показатели эффективности деятельности (в том числе экономические) не позволяют адекватно проводить сравнение с круглосуточными стационарами.

Материалы и методы. Анализируется лечение 35 тыс. пациентов на кафедре амбулаторно-поликлинической помощи Военно-медицинской академии им. С.М. Кирова в 2005–2024 гг., а также статистические данные, опубликованные в сборнике «Здравоохранение в России» за 2023 г., материалы 6 съездов амбулаторных хирургов, научных трудов и статей. Рассмотрены особенности организации работы, профилизации и статистические показатели деятельности дневных хирургических стационаров в их динамике в XXI в.

Результаты. Показано, что за 2010–2019 гг. количество коек в дневных стационарах медицинских организаций, оказывающих помощь в стационарных условиях, увеличилось на 14,4 %, а в амбулаторных условиях — на 17,1 %. Однако средняя занятость койки в дневных стационарах больниц сократилась с 293 дней до 287, а в дневных стационарах поликлиник — с 322 до 309. При этом среднее число занятости коек в круглосуточных стационарах больниц составляло от 310 до 319 дней. Эти данные свидетельствуют о слабой ресурсосберегающей работе коек дневных стационаров вследствие их недозагруженности и, как следствие, низкой экономической эффективности.

Заключение. Выявлено, что основной проблемой лечебного процесса в дневных хирургических стационарах является невозможность оценки определения его эффективности. С этой целью требуется установить нормативные показатели его работы, определить статус койки и значительно увеличить ее оборот. Целесообразно ввести непосредственное финансирование всех дневных стационаров, оценивать стоимость законченного случая лечения по единому базовому тарифу независимо от типа медицинской организации, проводившей лечение.

Ключевые слова: стационарозамещающая форма оказания хирургической помощи; дневной хирургический стационар; показатели деятельности дневного стационара; оборот койки; среднее число занятости койки; эффективность использования дневного хирургического стационара.

Как цитировать

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BACKGROUND

The Russian Federation (RF) is currently engaged in an urgent initiative to modernize its healthcare system, particularly focusing on enhancing primary care services. A promising avenue involves expanding outpatient medical care, including surgical care, by introducing new organizational forms and advanced technologies [1–3]. The establishment of an independent form of medical care, namely, ambulatory surgical care, is characterized by the expansion of the list of diseases for which care is provided outside 24-hour inpatient facilities, with a simultaneous increase in the number of surgical procedures performed in primary healthcare institutions [4].

The prerequisites for the development of ambulatory medical care were as follows [5]:

- Changes in the regulatory and legal framework for the activities of primary healthcare facilities
- Continuous improvement of economic activities of prehospital medical organizations
- Development of medical technologies with the introduction of minimally invasive and sparing methods of surgical and conservative treatments
- Experience in providing medical care to surgical patients in conditions of shortened stay in medical facilities
- Patients' positive evaluation of new forms of surgical care that do not change their lifestyle

Despite the current prevalence of resource-efficient technologies and their widespread use in practice, the ambulatory healthcare system of RF remains inefficient. A primary challenge lies in the inability to compare the quality and efficiency of day hospitals, due to the absence of performance standards to assess their work [6, 7]. Determining the status of a day hospital bed allows assessment of the efficiency of all resource-saving technologies.

This study aimed to evaluate the characteristics of work and efficiency of a day surgery unit.

METHODS

The study analyzed the treatment of >35,000 patients in the day surgical unit (DSU) of the Ambulatory Surgical Clinic (the Department of Ambulatory and Polyclinic Care [APC] since 2011) of the S.M. Kirov Military Medical Academy (MMA) in 2005–2024. The study used statistical data derived from the federal statistical survey (form no. 14DS) published in the 2023 Health Care in Russia report, materials from six congresses of ambulatory surgeons of RF, and scientific articles published in periodicals by prominent Russian medical experts studying the development of ambulatory medical

care, particularly DSU. The performance of day hospitals since 2005 was analyzed, including the number of performed surgical procedures, the number of hospitals and medical organizations providing primary healthcare, bed turnover, and the average bed occupancy. Performances for 2021 and 2022 were not analyzed owing to the repurposing of many primary healthcare providers to treat patients infected with the novel coronavirus.

RESULTS AND DISCUSSION

DSU is the main prehospital unit providing ambulatory care for surgical patients. Currently, its activity is regulated by the Orders of the Ministry of Health of the RF (MHRF) no. 438, On Organization of Day Hospitals in Medical and Preventive Institutions,¹ dated December 9, 1999, and no. 922n Procedure for Providing Surgical Care to the Adult Population, dated November 15, 2012². Additionally, the provision of medical care in day hospitals is regulated by Federal Law no. 323, On the Fundamentals of Health Protection of Citizens in the RF, dated November 21, 2011. According to this law, a day hospital is a structural subdivision of a medical organization (or its structural subdivision) providing primary medical and sanitary care. It provides treatment and diagnosis of diseases and conditions that do not require constant medical supervision.

The MMA APC Clinic and DSUs in Moscow, St. Petersburg, Stavropol, and other cities have accumulated over 30 years of experience, which has demonstrated the effective sanitation at the prehospital stage, in outpatient surgical clinics, and in patients with common diseases such as varicose veins of the lower extremities, external abdominal hernias, and external male genitalia diseases [8]. The organizational structure of DSUs vary. These units are recognized as functional subdivisions of inpatient and outpatient medical facilities.

As practice has shown, DSUs of outpatient clinics are primarily developed for the diagnosis, surgical and conservative treatment, and postoperative management of patients.

Conversely, DSUs in inpatient facilities are established for presurgical evaluation with complex diagnostic techniques not available in the outpatient network, postsurgical patient follow-up, and chemotherapy for cancer patients. DSUs

¹ Order of the MHRF no. 438, On the Organization of Day Hospitals in Medical and Preventive Institutions, dated December 9, 1999. Available at <https://docs.cntd.ru/document/901754138>. Accessed on February 24, 2025.

² Order of the MHRF no. 922n, Procedure for Providing Surgical Care to the Adult Population, dated November 15, 2012. Available at <https://minzdrav.gov.ru/documents/9124>. Accessed on February 24, 2025.

can be organized as independent institutions with their own premises, subdivisions, and services to support their activities. In such cases, they become ambulatory surgical centers.

The DSU profile is determined based on the demands and needs of practical healthcare. Consequently, the establishment of general surgical DSUs, specialized units (phlebology, gerontology, or ophthalmology), or multidisciplinary units comprising specialists from various categories of surgical specialties (traumatologist, urologist, and gynecologist) may be warranted.

The treatment outcome in the DSU largely depends on the treatment process and the quality of the medical staff's performance. Thus, the selection of medical staff is critical, as the professionalism of the medical and nursing staff ultimately determines the success of the DSU.

The DSU head should be a highly skilled surgeon with sufficient experience working in an inpatient hospital setting. All DSU staff should be aware that the day hospital is a special facility that requires a level of performance that may not have been necessary in previous jobs. The DSU should be located in an isolated unit or a separately designated building. The interaction between patients treated in day and 24-hour hospitals must be excluded.

Selecting patients for treatment in the DSU is the first and most crucial stage in the entire treatment and diagnosis process. When determining the possibility of treatment in the DSU, a fundamentally new requirement should be considered: the social factor of the patient's current living conditions or contraindications of a social nature (unequipped housing, absence of a telephone, or the patient lives alone). Patients for treatment are selected by the DSU specialists during the consultation of patients referred from outpatient clinics, medical and sanitary units, etc. The following factors were determined: the possibility of treating the patient in a day hospital, expediency of surgical intervention, scope of surgery, and specifics of preoperative preparation. The patient's condition is assessed, concomitant diseases are clarified, and an allergological history is evaluated. The preoperative examination of patients should adhere to established standards and clinical recommendations for specific nosological forms.

The patient is examined again after receiving the preoperative examination results. The medical staff of the DSU evaluates the examination results, determines the date of surgery and preoperative preparation, and prescribes the necessary pharmacotherapy. On the day of surgery, after the patient arrives at the DSU, the medical documentation is prepared, and the patient is admitted to the department, dressed, and placed in the ward. The patient is examined

by the operating surgeon and anesthesiologist. The patient's blood pressure, pulse, and body temperature are measured, and premedications are administered to assess the patient's condition.

Surgical treatment in the DSU has its peculiarities. Notably, the patient is no longer under the constant supervision of the medical staff in the hours following surgery. Despite the fact that the level of risk for surgical procedures of the same complexity is nearly equivalent in inpatient facilities and DSU, the requirements for the quality and reliability of outpatient surgery are significantly higher. These requirements include the prevention of postoperative complications, particularly bleeding; prevention of severe pain syndrome; and assessment of the patient's vital functions prior to discharge. This emphasizes the importance of professional training in ensuring competence of DSU surgeons and all medical staff.

After surgery, the patient is transferred to the DSU and observed for 3–5 h (depending on the extent of the surgery and patient's condition). The total duration of stay in the DSU on the day of surgery is 3–8 h. Active management of the postoperative period and early mobilization of the patient after surgery (hernioplasty, removal of varicose veins of the extremities, etc.) are critical in the DSU.

One hour after surgery, the attending physician or nurse should perform a series of light physical exercises for 10 minutes with the patient lying in bed, including turning the body from side to side, limb movements (flexion and extension), and head turning. Then, within 1 hour following surgery, the patient performs these movements independently for 5–6 min with rest intervals of 10 min. Subsequently, the patient is permitted to exit the bed (initially under the physician's supervision) and walk around the ward and corridors of the DSU. The patient's somatic condition is determined and monitored by pulse rate, blood pressure, and oxygen saturation.

After active observation in the ward and subsequent determination by the attending physician that the patient is medically cleared to return home (typically 3–4 h after surgery), the patient is discharged in an attached DSU or personal vehicle. The evening after surgery, the DSU surgeon monitors the patient's condition by telephone.

The following day, the patient should return to the DSU for examination, dressing change, wound control, and infusion therapy, if necessary. The sequence and frequency of subsequent examinations are investigated by the attending physician, considering the course of the postoperative period, patient's condition, and specifics of the therapy.

The mean duration of the patient's stay and treatment time in the DSU following surgical intervention, conservative

Table 1. Comparative assessment of bed space efficiency in day surgery units
Таблица 1. Сравнительная оценка эффективности коечного фонда дневного хирургического стационара

Parameters	Day surgery units of the Department of Ambulatory and Polyclinic Care of the S.M. Kirov Military Medical Academy	Day surgery units of the Ministry of Health of the Russian Federation
Bed turnover	137	37–50
Average bed occupancy	1386	309–322

treatment, or examination is 2–3 h. After the patient leaves the DSU, the bed linen is removed from the bed and packed into a bag that contains the patient’s data. The bags are stored in a special closet located in the ward. Subsequently, another patient is positioned on the bed.

Several patients need to be treated in one hospital bed during the day; thus, the medical staff should clearly plan and distribute the time of patients’ visits to the DSU so that patients do not arrive at the same time and do not cause queues. The comfort of the patient’s stay and quality of the medical care in the day hospital are critical.

The state has implemented measures that have led to the increase in the number of beds available in day hospitals in recent years. These measures involve the inclusion of day hospitals within the nomenclature of medical units under the MHRF and development of staffing, equipment, and other resources. For example, from 2010 to 2019, the number of day hospital beds in inpatient facilities increased by 14.4% (from 84,206 to 96,334 beds) and in outpatient facilities by 17.1% (from 135,484 to 158,690 beds). However, during the same period, the average bed occupancy in day inpatient hospitals decreased from 293 to 287 days and from 322 to 309 days in day outpatient hospitals [9]. Concurrently, the average bed occupancy in 24-hour inpatient hospital beds from 2010 to 2019 ranged from 310 to 319 days [10]. Available data indicate that the resource-efficient performance of day hospital beds is suboptimal due to their underutilization, resulting in low economic efficiency.

In the Russian healthcare system, there are no established standards for evaluating the performance of day hospitals. The status of a day hospital bed remains undefined, and the turnover and occupancy rates are low. These factors impede the development of an effective ambulatory medical care system.

Analysis of DSU bed utilization at the MMA APC clinic over the last 15 years has shown that the number of patients treated in one bed is significantly higher than the bed utilization in day hospitals of primary medical organizations of the MHRF (Table 1).

This may be because at the APC clinic, approximately three patients are treated on a single day hospital bed, whereas at the DSUs of the MHRF, the occupancy rate is approximately one bed [11]. The low utilization of day hospitals within the

MHRF demonstrates their underutilization and inefficiency, resulting in unsatisfactory economic outcomes [9, 12]. In this regard, activities aimed at improving the efficiency of existing bed stock of day hospitals are crucial.

None of the title documents address the turnover of beds, nor do they establish norms for their utilization. Furthermore, there are no provisions for adjustments to the staff of day hospitals in accordance with the number of patients seeking treatment. However, in assessing the performance of day hospitals, financial savings from patient treatment are not calculated. The economic performance of day hospitals is evaluated solely based on the earned funds.

Allocating financial resources to day hospitals through federal or local budgets is not a prevailing policy in the RF. The Territorial Fund of Compulsory Health Insurance identified a disproportion in the financial evaluation of the economic case for treatment, which negatively impacts the development of ambulatory medical care.

The financial burden of a completed case of treatment managed according to adopted standards should be equivalent to a single basic tariff with the appropriate nosological form, irrespective of the type of institution providing treatment. Such an approach stimulates the development of ambulatory medical care by creating a difference between a single basic tariff and the actual costs of treatment. Concurrently, financial resources will be allocated to provide economic incentives for the medical staff of day hospitals.

CONCLUSION

The results of patient treatment in day hospitals largely depend on how treatment and diagnosis are organized and how well the medical staff performs. Selecting patients for treatment in the DSU is a crucial stage in the overall process. When performing surgical procedures in the DSU, it should be noted that patients are not under constant supervision by medical staff in the hours following surgery. In this regard, the quality and reliability requirements for outpatient surgery are significantly higher than those for inpatient surgery.

The primary challenge associated with treatment in the DSU is the inability to assess its efficiency. Therefore, it is necessary to establish standards of DSU performance,

determine the status of a DSU bed, and significantly increase its turnover. A minimum of 2–3 patients should be treated in a DSU bed during a given day.

Direct financing of all day hospitals should be implemented, with the objective of calculating the cost of a completed case of treatment at a single basic tariff, irrespective of the type of medical institution that provided the treatment. The savings of financial resources in day hospitals should be calculated and returned to the budget of these facilities. Resolving these issues will enable DSUs to develop further and fulfill their primary goal of providing high-quality and resource-efficient treatment.

ADDITIONAL INFORMATION

Authors' contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study.

The contribution of each author. D.V. Ovchinnikov, data analysis, writing an article; V.V. Vorobyov, general concept

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Competing interests. The authors declare that they have no competing interests.

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