ORGANIZATION OF HEALTHCARE, MEDICAL SCIENCE AND EDUCATION

DOI 10.25789/YMJ.2024.86.11

UDC 614.253.83

D.O. Ivanov, V.I. Orel, Y.V. Petrenko, A.V. Kim, V.M. Sereda, N.A. Gurieva, V.I. Smirnova, L.L. Sharafutdinova, T.I. Buldakova, A.G. Kulev, A.K. Ushkats, Z.A. Roslova, A.M. Kakanov

THE EXTERNAL AUDIT AS A TOOL FOR IMPROVING MEDICAL CARE

Based on the results of the expert assessment of the medical records of children who received treatment in the 24-hour hospital, the following was revealed: 75% (2021) and 25% (2022) of patients were unreasonably hospitalized; there was an overlap between the flows of patients with infectious and somatic pathology; records in the medical history do not reflect a complete review of the patient and the dynamics of observation; there is no justification of the diagnosis and prescription of medications; the time of observation, transfers and examination of patients is not indicated; when consulting with other specialists, there are no records in the medical history of the patient; there is a lack of justification and interpretation of instrumental and laboratory tests, etc. The identified problems should be taken into account when developing organizational measures for improving medical care for children in hospital.

Keywords: children, pediatric hospital, in-patient medical records, expert assessment, check-list.

IVANOV D.O. - MD, Professor, Rector of FSBEI HE Saint Petersburg State Pediatric Medical University MH RF, SPIN code: 4437-9626; AuthorID: 187004; https://orcid.org/0000-0002-0060-4168; **OREL V.I.** - Honored Worker of Science of the Russian Federation, MD, Professor, Vice-Rector for Research, Head of the Department of Social Pediatrics and Health Care Organization of the Faculty of Postgraduate and Additional Vocational Education of FSBEI HE Saint Petersburg State Pediatric Medical University MH RF, SPIN-code: 8882-8738; AuthorID: 400791; https://orcid.org/0000-0001-6098-3449; **PETRENKO Yu.V.** - PhD in Medicine, Vice-Rector for National Projects and Therapeutic Work, Faculty of Postgraduate and Additional Vocational Education of FSBEI HE Saint Petersburg State Pediatric Medical University MH RF, SPIN-code: 1644-1394; AuthorID: 407165; https://orcid.org/000-0002-86234574; **KIM A.V**. - MD, Associate Professor, Professor of the Department of Social Pediatrics and Health Care Organization, Faculty of Pediatrics and Health Care Organization, Faculty of Postgraduate and Additional Vocational Education of FSBEI HE Saint Petersburg State Pediatric Medical University MH RF, SPIN-code: 3640-0781; AuthorID: 341746, https://orcid.org/0000-0002-3423-5043; **SEREDA V.M.** - MD, Professor, Professor of the Department of Social Pediatrics and Health Care Organization of the Faculty of Pediatrics and Health Care Organization, Faculty of Postgraduate and Additional Vocational Education of FSBEI HE Saint Petersburg State Pediatric Medical University MH RF, SPIN-code: 3462-3753; AuthorID: 434059, https://orcid.org/0000-0001-8593-8601; **GURIEVA N.A.** - PhD in Medicine, Associate Professor of the Department of Social Pediatrics and Health Care Organization of the of the Faculty of Pediatrics and Health Care Organization, Faculty of Postgraduate and Additional Vocational Education of FSBEI HE Saint Petersburg State Pediatric Medical University MH RF, SPIN-code: 8111-3775; AuthorID: 838319; https://orcid.org/ 0000-0001-8827-3537; **SMIRNOVA V.I.** - PhD in Medicine, Associate Professor of the Department of Social Pediatrics and Health Care Organization, Faculty of Pediatrics and Health Care Organization, Faculty of Postgraduate and Additional Vocational Education of FSBEI HE Saint Petersburg State Pediatric Medical University MH RF, SPIN-code: 5742-3187; AuthorID: 1037260, https://orcid.org/0000-0002-3741-3592; **SHARAFUTDINOVA L.L.** - PhD in Medical Sciences, Associate Professor of the Department of Social Pediatrics and Health Care Organization, Faculty of Postgraduate and Additional Vocational Education of FSBEI HE Saint Petersburg State Pediatric Medical University MH RF, SPIN-code: 2230-8341; AuthorID: 905229, https://orcid.org/0000-0002-3478-6043; **BULDAKOVA T.I.** - PhD in Medicine, Associate Professor of the Department of Social Pediatrics and Health Care Organization, Faculty of Postgraduate and Additional Vocational Education of FSBEI HE Saint Petersburg State Pediatric Medical University MH RF, SPIN-code: 2615-2714; AuthorID: 542528; **KULEV A.G.** - PhD in Medical Sciences, Associate Professor of the Department of Social Pediatrics and Health Care Organization, Faculty of Postgraduate and Additional Vocational Education of FSBEI HE Saint Petersburg State Pediatric Medical University MH RF, SPIN-code: 2781-6561; AuthorID: 1022610; **USHKATS A.K.** - PhD in Medical Sciences, Associate Professor of the Department of Social Pediatrics and Health Care Organization, Faculty of Postgraduate and Additional Vocational Education of FSBEI HE Saint Petersburg State Pediatric Medical University MH RF, AuthorID: 459064, https://orcid.org/0009-0003-2120-6788;**ROSLOVA Z.A.** - PhD in Medical Sciences, Assistant of the Department of Social Pediatrics and Health Care Organization, Faculty of Postgraduate and Additional Vocational Education of FSBEI HE Saint Petersburg State Pediatric Medical University MH RF, SPIN-code: 4804-8108; AuthorID: 838306; https://orcid.org/ 0009-0001-4657-2982; **KAKANOV A.M.** - Assistant of the Department of Social Pediatrics and Health Care Organization, Faculty of Postgraduate and Additional Vocational Education of FSBEI HE Saint Petersburg State Pediatric Medical University MH RF, SPIN code: 5186-2944; AuthorID:796031.

Introduction. The Article 4 of the Federal Law No. 323-FL “On the Fundamentals of Health Protection of Citizens in the Russian Federation” defines the priority of children's health protection among the basic principles of health protection [7]. In modern conditions, the medical and demographic indicators of children's health are characterized by a low birth rate, high morbidity rates, early chronicity of pathological processes, and an increase in the number of children classified as health group 3 according to the results of preventive medical examinations. In this regard, improving the quality of medical care for children is of paramount importance in the organization of children's health care [3, 6].

In-patient medical care is the most resource-intensive type of medical care. Therefore, it is necessary to control the validity of hospitalization and the quality of inpatient care. Rationality of resource utilization is carried out by means of expert assessment of inpatient treatment cases. Based on the results obtained, measures are developed to improve the quality and availability of medical care for children with optimal resource utilization [1, 2, 5, 8].

Purpose. To analyze the organization of in-patient medical care for children in one of the regional pediatric clinical hospitals of the North-Western Federal District.

Materials and Methods. The Federal Statistics Surveillance Form N 30 “Information on Medical Organization” was studied. Medical records of the in-patients hospitalized in 2021 and 2022 were evaluated according to the check-list developed in accordance with the clinical recommendations. The sample was formed on the basis of the order of the Ministry of Health of the Russian Federation No. 231n dated March 19, 2021 “On Approval of the Procedure for Control of the Amount, Timing, Quality and Conditions of Medical Care Provision under Compulsory Medical Insurance to Insured Persons, as well as its Financial Support” and amounted to 3% of the number of cases of in-patient medical care (n=820) accepted for payment [4]. Analytical, statistical, and expert evaluation methods were used.

Results and Discussion. Within the framework of organizational and methodological activities in the profile of “Pediatrics” the staff of the National Medical Research Center of St. Petersburg State Pediatric Medical University (hereinafter - NMRC) conducted an external audit of one of the regional pediatric clinical hospitals of the North-Western Federal District.

The Regional Children’s Clinical Hospital is a multidisciplinary health care institution providing children with medical care at all levels - primary outpatient and inpatient care, specialized outpatient and inpatient care, and high-tech care. The medical organization works 24 hours a day as an emergency hospital for pediatrics, pediatric surgery and traumatology.

It interacts with all central district hospitals of the region, providing consultative and visiting medical care.

In 2022, the staff composition of the hospital was 952 people, including 145 physicians, 358 nurses. Over the two years, the percentage of physicians' staffing by individuals decreased, while there was an increase in staffing by employed positions, both among physicians and mid-level medical staff (Table 1). The compatibility ratio among physicians was 1.7 in 2021 and 1.9 in 2022, and among nurses it was 1.1 and 1.2, respectively.

The in-patient department has a 24-hour ward, a day hospital, a 24-hour trauma center, and a consultative and diagnostic polyclinic. The hospital has 16 therapeutic and 10 auxiliary departments of different profiles, providing inpatient care to patients from newborn to 18 years of age.

The structure of the 24-hour hospital includes the following departments:

- **Infectious-box department** for 5 boxes, where 30 beds of round-the-clock stay are deployed. Main areas of activity are:
  - hospitalization and treatment of patients with suspected infectious diseases or general somatic pathology with a concomitant infectious disease;
  - treatment of patients who have had contact with infectious patients;
  - treatment of diagnostically unclear patients;
  - treatment of children for social reasons (from disadvantaged families);
  - treatment of children under 6 years of age with acute viral infection.
- Infection Ward for Infants with 50 beds. The department is multidisciplinary with an infectious regime. All nosological forms of children from birth to 1.5 years of age are treated.
- The Department of Pathology of Newborns and Premature Babies No. 1 has 30 boxes (20 single and 10 double boxes). Since 2012 the department accepts children with weight over 2000 g and gestation period over 34 weeks (late premature babies who do not need nursing in a cuvette,) because it is equipped with only one cuvette.
- The Department of Pathology of Newborns and Premature Babies No. 2 (Department of Premature Babies) has 35 round-the-clock beds and maternity wards for mothers of children in the Department of Anaesthesiology and Intensive Care No. 2. There are 30 joint stay boxes in the structure of the department. There are four round-the-clock nursing posts that function there, while the standard is 8 posts.
- Pediatric Department №1 has 35 beds: 10 for patients with gastropathology, 20 for patients with bronchopulmonary pathology, 5 pediatric beds. Children aged from 1 year 6 months to 18 years are treated in the department.
- Pediatric Department No. 2 with 45 beds: 20 nephrology, 5 cardiology, 5 rheumatology, 15 endocrinology. In addition, there are 4 day hospital beds: 1 nephrology, 1 rheumatology, 2 endocrinology.
- Dermatovenerology Department for 12 beds, 10 beds of round-the-clock hospitalization and 2 beds of day hospitalization. There are 9 double boxes in the department, two boxes are allocated for children under one year of age, two boxes for day hospitalization, there are 5 reserve beds.
- Anesthesiology-Reanimation Department No. 1 is mainly for children over 1 month of life with 12 beds. The beds are assigned to specialized departments. There are no separate resuscitation beds!
- Anesthesiology-Reanimation Department No. 2 for newborns and premature babies for 6 beds.

In 2021, 13,544 children were treated at the hospital and in 2022, 14,117 children received treatment.

When analyzing the work of these departments, the following problems were identified:

- routing of emergency room patients with crossing of flows in case of admission of planned, emergency and respiratory pathology was violated;
- irrational use of isolation (Melzer) boxes during the period of spread of new coronavirus infection;
- routing of children from the infectious diseases ward (1st floor) with respiratory pathology to the infectious diseases ward for infants (2nd floor) was disrupted;
- patients with infectious pathology and somatic pathology were crossed on the infectious ward;
- placement of children of neonatal age (without infectious pathology) on the department with respiratory pathology;
- children with infectious pathology were assisted by pediatricians, as there were no infectious disease doctors on the staff;
- medical services were provided to adults in the absence of a license;
- biomaterials from patients were stored in the refrigerator of the treatment room.

Check-lists were developed for expert assessment of cases of medical care in the conditions of the Regional Children's Clinical Hospital, taking into account the current clinical recommendations. The evaluation was based on the study of patients' medical records.

In 2021, when analyzing the medical records of in-patients, attention is drawn to the following:

- in the presence of informed voluntary consent, the types of medical manipulations are not always indicated;
- diary records do not contain a complete description of the patient and the dynamics of observation;
- there is no chronology in keeping the medical history: indicating the time of observation, transfers and examination of patients;
- there are no temperature sheets, with the dynamics after the use of antipyretics;
- there is no justification for medical manipulations, as well as unjustified prescription of manipulations that are not included in the standards of medical care;
- in the presence of severe concomitant pathology - there is no record of a consulting physician, which does not comply with clinical recommendations and standards;
- there is no interpretation of instrumental examinations;
- there is no interpretation of laboratory examination;
- there is no justification of the diagnosis and rationale for prescribing medications, which leads to non-compliance with clinical recommendations;

Table 1

Staffing level of the Regional Children's Clinical Hospital (%)

Positions	Staffing by individuals (%)		Staffing by employed positions (%)	
	2021	2022	2021	2022
Physicians	57.4	53.0	97.4	98.8
Mid-level medical staff	78.5	79.0	89.6	96.4

- concomitant pathology is not fully included in the final diagnosis;
- the validity of hospitalization was only 25% (Table 2).

There was also a discrepancy between diagnoses in the medical history and in the discharge epicrisis (15%), the severity of the disease was not indicated in the medical history (22%), there was no calculation of nutrition for children under 1 year of age (12%), no calculation of infusion therapy (9%), in the presence of infectious pathology there was no bacteriological examination (sputum, urine) to identify the pathogen (14%).

In the examined hospital, electronic document management is not fully implemented, in particular, there is no information system for maintaining the patient's medical history.

Based on the results of the 2021 audit, the administration of the Children's Regional Clinical Hospital was recommended:

- to conduct training sessions on the implementation of clinical protocols, recommendations and standards of medical care from the position of validity of hospitalization in a 24-hour hospital;
- to strengthen work in the quality control system for completing primary medical documentation;
- to consider patient routing, in particular, to examine options for transferring infectious patients to a separate hospital building;
- to unify primary documentation (medical record of an inpatient) for all departments of the hospital;
- to train medical staff in additional educational programs to improve their qualifications;
- to provide training in the professional retraining program for specialists in the field of “infectious diseases”;
- to strengthen and implement control over compliance with clinical recommendations;
- to improve the medical information system, introduction of electronic medical history;
- to create templates for records of dynamic observation of an inpatient, consultations of specialized doctors, heads of departments, temperature list, etc. before the introduction of the electronic medical history;
- to provide re-equipping the hospital with the necessary medical equipment;
- to provide staffing positions for specialists of medical and nursing personnel.

The repeated audit conducted by NMRC specialists in 2022 showed the

Table 2

Comparative analysis of in-patient medical record check-list results in 2021 and 2022

№	Characteristic	% or point (from 0 to 20)	
		2021	2022
1	Justification for hospitalization (% of all reviewed case histories)	25	75
2	Availability of informed consent from parents or guardian (% of all reviewed medical records)	100	100
3	Availability of justification of diagnoses (% of all reviewed medical records)	60	100
4	Quality of rationale for diagnosis (number of points for every 10 medical records reviewed)	10	16
5	Availability of medical and life medical record data (% of all verified medical records)	60	100
6	Incomplete collection of medical record (number of points for every 10 medical records reviewed)	8	14
7	Presence of a plan of treatment and examination of patients in the examination of the head of the department (% of all checked medical records)	100	100
8	Presence of treatment and examination plan in the dynamics of observation (% of all checked medical records)	30	80
9	Quality of completion of treatment and examination plans (number of points for every 10 checked medical records)	10	16
10	Availability of justification of medication prescriptions (% of all checked medical records)	65	85
11	Quality of justification of medication prescriptions (number of points for every 10 medical records reviewed)	0	10
12	Presence of a protocol of MC for medications that are not included in Vital and Essential Drugs (% of all medical records where the medications were used)	100	100
13	Presence of polypragmasy (% of all reviewed medical records)	0	0
14	Compliance with clinical guidelines and protocols (% of all reviewed medical records)	100	100
15	Quality of application of clinical guidelines (examination and treatment) (number of points for every 10 medical records reviewed)	12	20
16	Availability of assessment of results of laboratory tests (% of all reviewed medical records)	85	100
17	Quality of evaluation of laboratory tests (number of points for every 10 medical records reviewed)	12	18
18	No examination, if necessary, of other specialists (Physiotherapy Treatment, infectious disease specialist, nephrologist, ENT, etc.)	20	8
19	No examination by an anesthesiologist before anesthesia benefit (% of all MRs where anesthesia was administered)	0	0
20	Neurological status normal, without neurologist examination (% of all MRs where a neurologist was required)	0	0

effectiveness of the implementation of the recommended measures. Thus, the proportion of justifiably hospitalized in 24-hour inpatient care increased 3 times to 75%, all audited records had justification of diagnosis (60% in 2021), complete medical and life history (60% in 2021), evaluation of laboratory results (85% in 2021). There was a 2.7-fold increase in the proportion of case histories containing treatment and examination plans in the dynamics of follow-up (80% in 2022; 30% in 2021). There was a 2.5-fold decrease in the number of case histories that did not have records of consultations during examinations by other specialists (20% in 2021; 8% in 2022). Justification of medication prescriptions was available in 85% of case histories against 65% in 2021 (Table 2).

Conclusion. To improve the organization of medical care for children in the conditions of the regional clinical hospital it is advisable to conduct both internal and external audits in order to objectively assess the current situation in the hospital and identify priority problems. Based on the results obtained, external auditors develop recommendations on the basis of which management decisions are made by the hospital administration to be implemented in the activities of the medical organization and to be monitored in dynamics in terms of their effectiveness.

References

1. Bezdolnaya T.Yu., Malakhova T.Yu. Ocenka effektivnosti auditorskih proverok v usloviyah cifrovizacii audita [Assessment of the effectiveness of audits in the conditions of digitalization of audit]. Vestn.In-ta druzhby narodov Kavkaza (Teoriya ekonomiki i upravleniya narodnym hozyajstvom). Ekonomich. nauki [Bulletin of the Institute of Friendship of the Peoples of the Caucasus (Theory of economics and management of the national economy). Economic sciences. 2019;1(49): 20 (In Russ.).]

2. Vlasova O.V. Ocenka napravlenij optimizacii upravlencheskoj i finansovoj deyatel'nosti sistemy zdravoohraneniya regiona [Evaluation of the directions of optimization of managerial and financial activities of the healthcare system of the region]. Karel'skij nauchn. zh-l [Karelian Scientific Journal. 2018; 7 (1) (22):108-111 (In Russ.).]

3. Ivanov D.O., Orel V.I., Antipov M.S. Sovremennye problemy organizacii medicinskoj pomoshchi detyam na municipal'nom urovne (na primere gorodskogo okruga Balashiha) [Modern problems of organizing medical care for children at the municipal level (on the example of the Balashikha city district)]. Medicina i organizaciya zdravoohr [Medicine and healthcare organization. 2022; 7 (1); 4-14 (In Russ.).] DOI: 10.56871/6226.2022.24.80.001

4. Prikaz Ministerstva zdravoohraneniya RF ot 19 marta 2021 g. № 231n «Ob utverzhdenii Poryadka provedeniya kontrolya ob"emov, srokov, kachestva i uslovij predostavleniya medicinskoj pomoshchi po obyazatel'nomu medicinskomu strahovaniyu zastrahovannym licam, a takzhe ee finansovogo obespecheniya» [Order of the Ministry of Health of the Russian Federation No. 231n dated March 19, 2021 "On Approval of the Procedure for Monitoring the Volume, Timing, Quality and Conditions of Providing medical care for Compulsory Medical insurance to Insured Persons, as well as its financial support" (In Russ.).]

5. Burova K.A. [et al.]. Rezul'taty mediko-ekonomicheskih ekspertiz i ekspertiz kachestva medicinskoj pomoshchi kak kriterij effektivnosti raboty mnogoprofil'nogo stacionara [Results of medical and economic examinations and examinations of the quality of medical care as a criterion for the effectiveness of a multidisciplinary hospital]. Problemy gorodskogo zdravoohraneniya [Problems of urban healthcare. SPb., 2023; 28:168-172 (In Russ.).]

6. Ivanov D.O. [et al.]. Sluzhba ohrany materi i rebenka Sankt-Peterburga v 2021 godu [The Mother and Child Protection Service of St. Petersburg in 2021]. St. Petersburg: Publishing House of St. Petersburg State Medical University. 2022. 240 p. (In Russ.).]

7. Federal'nyj zakon ot 21.11.2011 № 323-FZ «Ob osnovah ohrany zdorov'ya grazhdan v Rossijskoj Federacii» [Federal Law No. 323-FZ of 21.11.2011 "On the Basics of public health protection in the Russian Federation" (In Russ.).]

8. Orel V.I. [et al.]. Ekspertiza v medicinskoj praktike [Expertise in medical practice. Saint Petersburg: SpecLit, 2017. 535 p. (In Russ.).]