SPECIALIZED TRAUMATOLOGICAL AND ORTHOPEDIC CARE FOR CHILDREN THROUGH PUBLIC–PRIVATE PARTNERSHIP PROGRAMS IN THE NOVOSIBIRSK REGION

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Aim: To evaluate the feasibility of an organizational model of specialized traumatological and orthopedic care for children using public–private partnership mechanisms in the Novosibirsk region.

Material and Methods: Data from patients visiting the Federal State Novosibirsk Research Institute of Traumatology and Orthopedics between 2011 and 2015 were acquired from “Medassist,” the local medical information system. Data were subsequently analyzed to identify the relative extent of medical care provided.

Results: This study included results from an organizational model of specialized traumatological and orthopedic care for children developed via public–private partnership mechanisms that have been implemented in the Novosibirsk region since 2011. A number of institutions were involved in this model of medical care for children with traumatological and orthopedic pathology, including the Federal State Novosibirsk Research Institute of Traumatology and Orthopedics, Clinic “NIITO” (a non-governmental medical organization), and various other primary health care organizations, including children's polyclinics and hospital outpatient departments. This model allowed us to create a closed (full) cycle of provision for specialized traumatological and orthopedic care, from primary treatment to the completion of rehabilitation with dynamic supervision throughout. This was accomplished by combining various clinical stages, including the specialized clinic, hospital, rehabilitation organization, and outpatient clinic. The main areas of this model include timely and reliable detection; determination of treatment indicators; appropriate definition of treatment terms; and the provision of specialized medical care, including high technology input, rehabilitation, and dynamic monitoring.

Conclusions: Implementation of an organizational model of specialized traumatological and orthopedic care for children in the Novosibirsk region using mechanisms associated with public–private partnerships has proved to be very positive. Application of the model allowed improvements in the availability of specialized traumatological and orthopedic care for children to ensure succession in the stages of medical care and to increase the number of cases entering rehabilitation. Therefore, this model demonstrates the viability of providing medical care to the population through the mechanisms of public–private partnership.

Keywords: specialized traumatological and orthopedic care, children's population, succession, rehabilitation.

Introduction

Well-established interactions between medical organizations at different levels of outpatient, inpatient, and rehabilitation stages play key roles in providing high-quality care for the population. Timely diagnosis and treatment of diseases, as well as the continuity of treatment and diagnostic processes at the treatment stages contribute to more effective patient care. Currently, the problem of continuity of medical care between medical organizations remains an important task of the healthcare industry [1-4].

Materials and methods

In this study, we used the data retrieved from the MEDassist medical information system of Novosibirsk Tsivyan Scientific Research Institute of Traumatology and Orthopedics (Novosibirsk SRITO) for the period of 2011–2015 for the
provided pediatric medical care, including primary and secondary examinations by pediatric orthopedic surgeons, surgical treatment, medical rehabilitation, and follow-up [5].

**Results and discussion**

Since 2011, a new model of special traumatological and orthopedic care has been used to provide medical care to pediatric patients through a public and private partnership (PPP) in the Novosibirsk region (NSR) of the Russian Federation. In this model, medical care for children with traumatological and orthopedic pathologies is provided by Novosibirsk SRITO, private medical organizations partnered with autonomous nonprofit organizations (ANO), SRITO hospitals (special rehabilitation units with bed space, outpatient consulting-diagnostic and consulting-rehabilitation units, and pediatric orthopedic centers), and other medical organizations to provide primary care (pediatric outpatient clinics and outpatient departments in pediatric hospitals).

The model includes primary and secondary examinations by pediatric orthopedic surgeons, specialized medical care (including high-technology medical care), and complex medical rehabilitation (outpatient, inpatient, and aftercare in special rehabilitation units, and sanatorium-resort therapy) (Fig. 1). The main objectives of this model are to provide timely diagnoses, define indications for particular treatment regimens, and specify the timelines for treatment via specialized medical care (including high-technology medical care), rehabilitation, and dynamic follow-up. Thus, the following self-contained (full) cycle of specialized medical care for children with traumatological and orthopedic pathologies was designed to ensure the continuity of medical care.

Children are examined by pediatric orthopedic surgeons (ANO SRITO hospital) through referral from primary healthcare specialists (practitioners, surgeons, and pediatric surgeons) and pediatric orthopedic surgeons in special medical settings of the NSR or on their own.

Recommendations of examination outcomes include the following:

- Specialized medical care (including high-technology) in Novosibirsk SRITO is indicated and the patient is included on the waiting list;
- Other forms of specialized medical care are recommended that are performed by special medical facilities in the NSR (i.e., Novosibirsk State Regional Clinical Hospital and City Emergency Children's Clinical Hospital);
- Dynamic follow-up is recommended for the patient and an appointment for the next visit is set;
- Conservative treatment or rehabilitation measures are indicated. In accordance with the parents’ choice, treatment may be conducted either in rehabilitation units of affiliated organizations or in medical settings at their place of residence.
- Additional examination with subsequent consultation is recommended for the patient.

According to the planned treatment regimen, specialized medical care (including high-technology) for children in Novosibirsk SRITO is provided in the Pediatric Orthopedic Department No. 1 (congenital and acquired vertebral deformations), in Pediatric Orthopedic Department No. 2 (congenital and acquired pathology of the musculoskeletal system, post-traumatic defects and deformations), or the prosthesis replacement department (if there are indications for prosthetic arthroplasty).

In accordance with national standards, the patients start receiving medical rehabilitation in the early postoperative period. The rehabilitation measures are presented in individual sessions by a therapeutic physical training instructor according to the disease profile, and respiratory gymnastics, massage, and physiotherapeutic procedures are conducted using mobile ward physiotherapeutic equipment. Rehabilitation is performed by specialists from the Medical Rehabilitation Department of Novosibirsk SRITO, which can provide 400 visits per shift for patients in the departments. Besides, the patients can receive medical rehabilitation at the Physiotherapeutic Department, gyms for therapeutic physical training using the Lokomat robotic complex and other devices, or massage rooms.

If it is recommended for a patient to continue dynamic supervision with a children's traumatologist-orthopedist from Novosibirsk SRITO or ANO SRITO hospital, on postoperative day 5 or 6, the patients are referred to special rehabilitation units of affiliated organizations for aftercare, where they continue with the medical rehabilitation course that was started in the hospital.
For those patients who do not require aftercare in a rehabilitation unit after inpatient treatment, dynamic supervision with a pediatric orthopedic surgeon may be recommended, according to indications for conservative treatment at the outpatient stage. At the same time, the patient may receive rehabilitation therapy at a convenient time and within a short period at an affiliated organization under the supervision of a pediatric orthopedic surgeon, or in a medical setting at the place of residence.

Rehabilitation services at ANO SRITO hospital are performed at the following locations:

1. Medical rehabilitation unit for hospital patients (44 beds), daycare hospital (24 visits per shift), three special outpatient units: children's orthopedic, consulting and rehabilitation and consulting-diagnostic ones (420 visits per shift, including 120 in the frameworks of statutory health insurance). The services offered by the unit include manual therapy, reflex therapy, mechanotherapy, hydrokinesotherapy, physiotherapy, massage and hydromassage rooms, and gyms for therapeutic physical training.
2. The three special inpatient rehabilitation units (140 beds), which include gyms for therapeutic physical training that are equipped with the Lokomat robotic complex, rooms for physiotherapy, mechanotherapy, massage, hydrotherapy, and hydrokinesotherapy.

Examinations by pediatric orthopedic surgeons, as well as medical rehabilitation, control diagnostic studies, and consultation by other specialists (for children with vertebral injuries) are offered at ANO SRITO hospital through funding from the statutory healthcare insurance system (since 2011, ANO SRITO hospital has been included in the registry of medical settings of the statutory healthcare insurance system in the NSR). Rehabilitation measures for children during 2 years after injury are available at the following frequencies: four courses during the first year and two courses during the second year. The course duration is 15 days. Medical and radiologic inspection is also available. The package includes medical massage, group sessions of therapeutic exercises, physiotherapeutic procedures (i.e., magnetotherapy and multichannel electric stimulation) upon a recommendation from a pediatric orthopedic surgeon, and electrophoresis, trans-cranial electric stimulation, oscillatory massage, and ultraviolet irradiation. Other than consultation from a pediatric traumathologist-orthopedist, in the framework of a complex rehabilitative approach, children receive consultations from a physician for therapeutic physical training and from a physiotherapist who selects the medical rehabilitation program individualized for the patient.

A positive example of the interactions in the frameworks of PPPs is the collaboration of the pediatric orthopedic center of ANO SRITO hospital with pediatric health centers in the design and implementation of therapeutic and preventive measures for children with traumatological and orthopedic pathologies, which include dynamic supervision, consultations, issuing recommendations on outpatient treatment at the place of residence, development of individual therapeutic programs, conducting rehabilitation treatment courses in pediatric orthopedic centers, and conducting screening examinations in educational settings in the NSR using optical computer tomography with subsequent submittal of the results to outpatient clinics at the child’s place of residence. As a result, the continuity in complex treatment of patients is ensured [6].

Thus, specialized traumatological and orthopedic care for children in the NSR performed within the framework of this model with the observance of the principles of stage development and continuity, represents a self-contained (full) cycle starting from the primary visit to the final stage of rehabilitation and dynamic supervision of the patient, which certainly contributes to ensuring a high level of treatment [7].

The efficacy of this specialized traumatological and orthopedic care model for children in the NSR using PPP mechanisms has been verified. From 2011 to 2015, the number of children who were consulted by pediatric orthopedic surgeon increased by 2.7-folds (from 11299 to 30944), surgical treatment by 34% (from 886 to 1187), complex medical rehabilitation by 23-folds (from 438 to 9995), and the number of children receiving dynamic supervision with pediatric orthopedic surgeon by 2-fold (from 3786 to 7874) [5].

Conclusions

1. Positive results were obtained from the application of an organizational model of specialized traumatological and orthopedic care for children in the NSR, using the mechanisms of PPPs, which is the evidence of its efficiency. Application of this model facilitated increased accessibility of specialized traumatological and orthopedic care for children and ensured the continuity of care and increased the scope of rehabilitation. The aforesaid is the evidence of relevance of medical care for the population using the mechanisms of PPP.
2. The suggested model was found to be efficient and suitable for application in other regions of the Russian Federation.

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2. Концепция развития системы здравоохранения в Российской Федерации до 2020 г. [Электронный
Организация оказания специализированной травматолого-ортопедической помощи детскому населению с использованием механизмов государственно-частного партнерства на примере Новосибирской области

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Цель исследования: обосновать целесообразность организационной модели специализированной травматолого-ортопедической помощи детскому населению с использованием механизмов государственно-частного партнерства на примере Новосибирской области.

Материалы и методы. В работе использованы данные медицинской информационной системы МЕДассист Новосибирского НИИТО им. Я.Л. Цивьяна за период 2011–2015 гг. об объемах оказанной медицинской помощи детям.

Результаты. В работе представлены результаты реализованной в Новосибирской области с 2011 г. организационной модели специализированной травматолого-ортопедической помощи детскому населению с использованием механизмов государственно-частного партнерства. В оказании медицинской помощи детям с травматолого-ортопедической патологией в рамках данной модели участвуют Новосибирский НИИТО им. Я.Л. Цивьяна, негосударственные медицинские организации-партнеры АНО «Клиника НИИТО», медицинские организации первичного звена здравоохранения (детские поликлиники, поликлинические отделения больниц). Данная модель позволила создать замкнутый (полный) цикл оказания специализированной травматолого-ортопедической помощи, начиная от первичного обращения пациента и завершая реабилитацией и динамическим наблюдением, объединяя следующие этапы: поликлиника (специализированный прием) — стационар — реабилитационные организации — поликлиника. Основными направлениями данной модели являются: своевременное выявление — достоверная диагностика и определение...
показаний к видам лечения — определение сроков лечения — оказание специализированной медицинской помощи (в том числе высокотехнологичной) — реабилитация — динамическое наблюдение. Выводы. В результате внедрения организационной модели специализированной травматолого-ортопедической помощи детям в Новосибирской области с использованием механизмов государственно-частного партнерства получены положительные результаты. Внедрение данной модели позволило повысить доступность специализированной травматолого-ортопедической помощи детям, обеспечить преемственность на этапах ее оказания, увеличить объем реабилитационной помощи. Вышеизложенное свидетельствует о целесообразности оказания медицинской помощи населению с использованием механизмов государственно-частного партнерства.

Ключевые слова: специализированная травматолого-ортопедическая помощь, детское население, преемственность, реабилитация.

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