THE TURNER SCIENTIFIC RESEARCH INSTITUTE FOR CHILDREN'S ORTHOPEDICS
The history of the Institute begins at the end of the XIX century (1890), when the charity Blue Cross created ‘The shelter for crippled and paraplegic children’ with personal support of the founder of Russian pediatric orthopedics – Professor Henry Turner. The chief doctor of the shelter was N. Shnirman, who then became the first director of the Institute.

In the shelter, children were provided with medical treatment and at the same time taught various skills to introduce them to socially useful work and encourage their natural abilities.

‘The Turner Institute for the rehabilitation of physically handicapped children and adolescents’ was created on 25 March, 1932 by Order number 28 of the Leningrad City Health Department. The following year, by Order of the People’s Commissariat of the RSFSR, the Institute became republican.

Thus, Henry’s idea was realized: ‘The Institute should become, and is becoming, a center for the organization of combating children’s disabilities in the USSR, and a center for the methodological organization of this struggle’.

In the development of scientific issues not only Henry Turner himself took part as the consultant of the Institute, but also many of his colleagues - the professors and surgeons from the Military Medical Academy. His first PhD post-graduate student at the Institute Z.Lyandres became a professor and worked here all his life.

Surgery began to expand: surgical treatment of children with congenital hip dislocation, congenital clubfoot, ectromelia, scoliosis, orthopedic sequelae of poliomyelitis, cerebral palsy. The system of organization of early detection, treatment and dispensary observation of children with congenital and acquired diseases of the musculoskeletal system was developed and implemented in the USSR.

In 1967, through the efforts of the Director, Professor M. Goncharova, the Institute received new medical buildings in the town of Pushkin, where it was equipped with 400 beds for the treatment of children suffering from congenital and acquired diseases of the musculoskeletal system, neuro-orthopedic disorders and rheumatoid arthritis.

After Professor M. Goncharova, Professor L. Zakrevsky, P. Fischenko, V. Demyanov, N. Ovsyankin, V. Andrianov, E. Tikhonenkov and Y. Pozdnikin became the directors of the Institute.

Since 2005, the Institute was headed by A. Baindurashvili. He put his talent as an organizer in the reconstruction of the Institute, built a new clinical building, laid out in 1988, opened new operating rooms, and rebuilt the building on Lakhtinskaya Street, where the Consultative and Diagnostic Center was opened.
“Our Institute really can be considered unique. Recently, we have introduced the latest methods of diagnosis and treatment of congenital and acquired disorders of the musculoskeletal system, starting from the earliest age. The surgical program of early treatment of children with deep extensive burns is substantiated and actively used. Systems of early conservative treatment of children with congenital clubfoot, with hip dysplasia, since the period of newborns, have been created. Constant attention is paid to the development of new diagnostic methods - ultrasonographic (including the stage of fetal development), endoscopic, computer and magnetic resonance imaging, X-ray densitometry.

The next stage in the development of the Institute was in December 2012 after the ceremonial opening of the Consultative Diagnostic and Training Center in reconstructed historical building on Lakhtinskaya Street, 10, which can rightly be called the cradle of the Turner Institute for Children's Orthopedics. It was built in 1911-1914 on the instructions of Henry Turner on the project of the architect N. Brodovich specially to accommodate the shelter for children with developmental disorders of the musculoskeletal system. Reconstruction of this building with an area of more than 4.6 thousand sq. m. started in June 2010 and was completed in December 2012. The Center is equipped with medical diagnostic facilities that have the characteristics of the latest technical world developments, and robotic simulators for rehabilitation. The Center has all the necessary conditions for the admission, diagnosis and treatment of children with musculoskeletal disorders. Minimally invasive surgical interventions are carried out; a day hospital is open as well.

In total, the Institute’s clinic includes 500 beds for children with injuries of the musculoskeletal system and has 9 specialized surgical departments, rehabilitation department, robotic rehabilitation department, operating unit with anesthesiology and intensive care department, laboratory units, accompanying and support services.

Friendly scientific relations with foreign countries such as Sweden, Denmark, Poland, Austria, the USA, Australia, etc. are actively supported in the field of topical issues of children’s orthopedic and trauma surgery, joint scientific research is carried out.

I would like to point out that the outstanding team of scientists and physicians recognized both in Russia and abroad works in the Institute today”.

Alexey Baindurashvili - Director of the Institute, Chief pediatric orthopedic and trauma surgeon of St. Petersburg, Honored Doctor of the Russian Federation, MD, PhD, Professor, Member of the Russian Academy of Sciences.
In the consultation and diagnostic department, the Institute’s leading specialists carry out consultations for children and teenagers suffering from trauma sequelae, congenital and acquired diseases of the musculoskeletal system. They also participate in the assessment of the short-term and long-term results of the treatment of both inpatients and outpatients. During consultations, patients who are, in the doctors’ opinion, in need of admission in the Institute’s clinics, are selected.

Through the work of the consultation and diagnostic department, neonatal children and infants with abnormal hip joints are, for the first time in Russia, provided with comprehensive functional, conservative treatment with braces and other supports, developed at the Institute.

Through outpatient services, children with congenital foot defects are performed serial casting from the first days of their lives. If necessary, a comprehensive examination can be carried out in the Institute’s laboratories in conjunction with the consultation.

Phone: +7 (812) 318-54-54
The Consultation and diagnostic Center is a unique multidisciplinary center with a broad therapeutic and prophylactic spectrum of activities, created on the basis of the Turner Scientific Research Institute for Children’s Orthopedics under the Ministry of Health of the Russian Federation.

Here, in reconstructed historical building of the Institute, located in the center of Saint-Petersburg, advanced medical technologies based on scientific developments and a rich clinical experience of the Institute are widely used, as well as examination and treatment of children with congenital and acquired orthopedic disorders.

The Center is intended to provide medical assistance to the children of Russia. The main goal of the Center is early diagnosis, timely treatment and comprehensive rehabilitation, preoperative preparation and rehabilitation at various stages of orthopedic and surgical treatment, based on constant interaction at the pre- and post-hospital stages with the clinic of the Institute.

The Center is equipped with modern high-tech facilities. It includes a day hospital, an operating room with patient’s rooms for rest, a clinical diagnostic laboratory, a room for neuropsychological rehabilitation. There are opportunities for neurophysiological studies. Dressing and casting rooms, rooms for medical procedures are designed in accordance with modern requirements.

The Center provides consultations by leading specialists of the Institute in the main areas of activity: traumatology and orthopedics, spine surgery, neurology, treatment after burns, rheumatology, and maxillofacial surgery.

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The department’s staff specializes in the treatment of children with congenital and acquired deformities of the lower and upper extremities with various diseases of the musculoskeletal system:

- Benign tumors and tumor-like bone diseases;
- Multiple exostosis chondrodysplasia;
- Orthopedic complications of hematogenous osteomyelitis;
- Congenital pseudarthrosis of the tibia, clavicle, and acquired pseudarthrosis and bone defects, the consequences of injuries;
- Congenital high scapula (Sprengel's disease);
- Blount's disease, Ollier's disease;
- Congenital and acquired limb length discrepancy;
- Fibrous dysplasia;
- Orthopedic complications after rickets and rickets-like diseases (phosphate-diabetes, fibrotic dysplasia, etc.);
- Congenital muscular torticollis;
- Congenital varus deformity of the femoral neck (coxa vara congenita).
In the spine surgery and neurosurgery department, children are treated for the following conditions:

- Scoliosis, kyphosis and degenerative diseases;
- Rare spinal defects;
- Malformations and neoplasms of the spinal canal and spinal cord;
- Congenital malformations of the central nervous system, craniocervical and hydrocephalic conditions;
- Sequela of spine and spinal cord injuries;
- Post-traumatic defects and malformations of the skull.

On the basis of the department the Federal Children's Center for spine and spinal cord injuries was created and actively works now.
The department provides treatment for patients with:

- Various dysplastic disorders of the hip joints (congenital dislocation and subluxation of the hip);
- Sequelae of acute hematogenous osteomyelitis;
- Legg-Calve-Perthes disease;
- Slipped capital femoral epiphysis;
- Coxa vara deformity of the proximal femur;
- Sequelae of trauma and aseptic necrosis of the femoral head;
- Dysplastic coxarthrosis.

The surgeons of the department annually perform more than 500 reconstructive surgical operations of all complexity categories. In the surgical treatment of children and adolescents low-traumatic methods of interventions are used to stabilize the hip joint and ensure its further optimal development.

In severe cases, total hip replacement is performed, the number of which amounts to about 40 per year.
This is a specialized pediatric orthopedic department involved in the treatment of:

- Congenital clubfoot (conservative treatment by Ponseti method, surgical treatment);
- Various congenital abnormalities of the foot and leg;
- Gigantism of the lower limbs;
- Severe abnormalities of the lower limbs with rare genetic malformations and skeletal dysplasias;
- Orthopedic sequelae of spinal hernias;
- Conservative and surgical orthopedic treatment of children with neuroorthopedic diseases (Charcot-Marie-Tooth disease, Friedreich’s ataxia, and various forms of myopathy, polyneuropathy, and cerebral palsy).

In 2015, on the basis of the department the Center for the treatment of children with sequelae of spinal hernia was established (Spina Bifida Center).
The main area of modern activity for this department is orthopedic and neurosurgical treatment of children with orthopedic manifestations of neurological diseases:

- Cerebral palsy (all forms and degrees of severity) - all types of operations on contractures and deformities of the upper and lower extremities, reconstructive operations on the hip joint for subluxation and dislocation of the hip, neurosurgical operations aimed at reducing muscle tone, and conservative and restorative treatment including the use of botulinum toxins or radiofrequency effects on peripheral neuromuscular structures are performed;
- Sequelae of injuries and diseases of the central and peripheral nervous system;
- Neuroorthopedic disorders due to malformations of the spine and spinal cord.
The main areas of research and clinical activity in the department:

- Congenital abnormalities of the upper limbs (polydactyly, syndactyly, ectrodactyly, brachydactyly, adactyly, radial aplasia, radial and ulnar clubhand, humeroradial and radioulnar synostosis, gigantism, and others);
- Acquired deformities of the upper and lower limbs (sequelae of trauma, burns and electrical burns, infections);
- Deformities of the hand and upper limbs in rare genetic diseases: Apart, Poland’s, Down, Holt-Oram, Vater, TAR syndromes, and others;
- Microsurgical autotransplantation of various complexes of tissues in congenital and acquired deformities of the musculoskeletal system.
The priority areas of the department’s scientific and clinical work are:

- Medical and social rehabilitation of children with cicatricial soft tissue defects after thermal burns;
- Treatment of sequelae of injuries of large joints in children, including patients involved in professional sports followed by rehabilitation;
- Orthopedic surgery for children with birth trauma of the upper limb (Erb’s palsy, Erb-Klumpke paralysis);
- Treatment and prevention of post-traumatic ossification of the elbow joint and ischemic contracture of the forearm and hand;
- Treatment and rehabilitation of children with various types of juvenile arthritis including at the stage of arthrosis;
- The use of genetic engineering biological therapy in children with severe forms of juvenile rheumatoid arthritis;
- Differential diagnosis of arthritis and arthropathy of childhood.
Currently, the department carries out treatment for the entire spectrum of children’s reconstructive maxillofacial surgery:

- Treatment of children with congenital cleft lip and palate, including rare atypical orofacial clefts;
- Treatment of children with developmental maxillofacial soft tissue abnormalities;
- Treatment of children with congenital and acquired maxillofacial bone defects;
- Treatment of children with congenital malformations of the ear, post-traumatic scar deformities of the face and neck, benign tumors (together with children’s oncologists), tumor-like diseases, and dysplasia of the mandibular bones.
The department specializes in the treatment of the following disorders:

- Arthrogryposis;
- Congenital contractures and deformities of limbs in various genetic syndromes (arthrogryposis-like diseases);
- Imperfect osteogenesis;
- Disturbance of bone tissue metabolism;
- Sequelae of birth injury of the brachial plexus, as well as congenital plexopathy;
- Congenital malformations of the lower leg.

The range of surgical interventions performed by the specialists of the department includes operations on the peripheral nerves and brachial plexus, hardware correction of contractures and deformities, tendon plasty, joint and bone interventions using angular stability plates and external fixation devices, various types of skin plasty, microsurgical muscle flaps transplantation in order to restore the function of lost muscles.
This department specializes in the motor rehabilitation of children with neuroorthopedic disorders and trauma sequelae:

- Cerebral palsy;
- Sequelae of spinal hernias;
- Sequelae of spinal injuries, upper and lower limbs with varying degrees of neurological disorders;
- Arthrogryposis;
- Various diseases of the neuromuscular system, both congenital and acquired.

The main goals and tasks of the department are comprehensive rehabilitation of patients taking into account the degree of disease severity, individual characteristics of the child, and also the stage of orthopedic surgical treatment. Individual treatment regimens are represented by a combination of physiotherapy techniques, types of massage, physiotherapy exercises, robotic mechanotherapy and pharmacological therapy, serial casting and botulinum therapy.

The department is provided with all necessary equipment for restorative procedures. All treatment and recovery procedures are physiological, painless, and selected taking into account the detected disorder and the general state of health of the patient.

If necessary, the department provides psycho-educational testing and speech therapy.
The main objective of the department is improving the motor rehabilitation of children after comprehensive orthopedic and surgical treatment.

The department is equipped with robotic systems to restore the functionality of the lower limbs using Lokomat®, and the upper limbs - with Armeo®.

**Indications for training on the robotic system «Locomat»:**
- Cerebral palsy;
- Sequelae of craniocerebral and spinal injuries;
- Sequelae of spinal cord hernia;
- Disorders of hip and knee joints;
- Arthrogryposis;
- Myopathy;
- Polyneuropathy.

**Indications for therapy on the robotic system «Armeo»:**
- Developmental malformations of the upper limbs;
- Arthrogryposis;
- Cerebral palsy;
- Sequelae of craniocerebral and spinal injuries;
- Musculoskeletal diseases;
- Abnormality of the joints of the upper extremities.
The main aims of the department’s work are the maximum safety of the patient, high-quality anesthesia and the provision of a comfortable postoperative period.

**Advantages of the department:**
- Highly professional staff;
- Individual approach to the choice of anesthesia;
- Extensive use of regional analgesia;
- The use of modern high-tech anesthesia equipment, monitoring and postoperative care;
- The maximum use of blood-saving techniques: hardware reinfusion and preoperative preparation of autohemocomponents;
- The use of high-quality, modern medications and consumables;
- The continuous improvement of methods of anesthesia, postoperative analgesia, hardware and laboratory monitoring.
The scientific laboratory department performs extensive scientific work and provides all clinics with the necessary clinical diagnosis and treatments.

The department has a wide range of laboratory and instrumental research methods, including the following subdivisions:

- Clinical and diagnostic laboratory;
- Laboratory of physiological and biomechanical research;
- Department of X-ray diagnostics;
- Department of ultrasound diagnostics;
- Department of prosthetic and orthopedic supply;
- Genetic laboratory of the Center of rare and genetic diseases in children;
- Photo-film laboratory;
- Scientific and morphological laboratory;
- Experimental laboratory.

With their help, a comprehensive study of congenital and acquired disorders is performed in children of all age groups, including from the neonatal period, with assessment of anatomical and topographic and functional characteristics before and after conservative and surgical treatment, as well as at all stages of recovery.
The burn surgery department was established in 1971 on the initiative of Professor Nina Kazantseva. Now it is located in the Children’s hospital No.1 and is the clinical base of the Turner Institute.

The priority areas in research and clinical work of the department are: the creation of a complex technique of surgical treatment of patients with extensive deep, critical and supercritical burns and their subsequent rehabilitation. In recent years, much attention has been paid to the introduction of new biotechnologies in clinical practice using cell cultures.

The scientific and clinical work of the department is supervised by Professor Alexey Baindurashvili, MD, PhD, Member of the Russian Academy of Sciences. Researchers of the department prepared and defended 6 theses and published more than 100 scientific papers.

In 2008, for the unique case of life-saving and recovery from severe burns of the 14-year-old patient with 95% burn surface, a group of doctors A.Baindurashvili, M.Brazol, E.Tsvetaev and others were awarded the «Vocation» Prize to Russia’s best doctors.
The main activities of the department:

- Organization of scientific and practical events (conferences, symposiums, seminars, master classes) on topical issues of trauma and orthopedic care for doctors of the Russian Federation, the North-West Federal District and St. Petersburg;
- Informing the staff of the Institute and orthopedic and trauma specialists of the Russian Federation about scientific events in Russia and abroad;
- Development of the scientific activity of the Institute through the introduction of new information technologies: work in the Scientific Electronic Library, international databases;
- Preparation of materials about the Institute in various information publications;
- Patent-licensing activity of the Institute;
- Reviewing of scientific works of the Institute’s staff sent for publications in journals and collections of scientific papers;
- Organization of monthly practical classes in the School of Pediatric Orthopedic Doctor and meetings of the Association of Pediatric Orthopedic and Trauma Surgeons of St. Petersburg;
- Work on the publication of the journal «Orthopedics, traumatology and reconstructive surgery of childhood» (included in the List of Higher Attestation Commission and SCOPUS Database).
The educational activities at the Institute are performed according to residency programs in «Traumatology and Orthopedics», a PhD fellowship program on training of the academic staff in «Clinical Medicine», as well as programs of additional professional education (upgrade training).

More than 20 residents, 8-10 PhD students, 10-40 students under additional professional education programs are trained every year at the Turner Institute. Training in the residency is carried out in full-time, duration of 2 years (classes begin on September 1).

Study in a PhD fellowship program on training of the academic staff is carried out in full-time, duration of 3 years (classes begin on October 1).

Study under the programs of additional professional education is carried out in the form of on-the-job training for a period of 36 to 144 academic hours, as well as under the programs of continuing medical education of 18-36 academic hours. The admission of specialists to the workplace in the clinic of the Institute for the improvement of professional skills according to the Institute’s programs is carried out year-round by the assignment of the heads of medical institutions.

Educational activity is performed according to the License for the implementation of educational activity No. 0594 of March 14, 2013, issued by the Federal Service for Supervision in Education and Science.

The certificate on the state accreditation of educational activities №1941, issued by the Federal Service for Supervision in Education and Science, on May 20, 2016.

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HEAD
Natalia DOLZHENKO
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Mission of the department:

- Organization of international activities according to general guidelines of scientific research work of the Institute;
- Development and implementation of the perspective and current policy of international cooperation of the Institute;
- Coordination of activities on the development and implementation of international cooperation programs and in the field of international relations of the Institute;
- Organization of international scientific conferences, symposiums, seminars, master classes in the Russian Federation and abroad;
- Implementation of the Institute’s interaction with foreign scientific and practical medical institutions, as well as international companies and associations;
- Participation in the publication of scientific works of the Institute, collections of scientific papers, the journal of the Institute;
- Development of academic partnership with educational, scientific and clinical institutions abroad.

Every year the Institute gives lectures and holds seminars by leading foreign experts, world-famous professors and scientists in the field of pediatric orthopedics and reconstructive surgery. Every year various departments of the Institute provide training for foreign specialists.
In 2015, the Turner Scientific Research Institute for Children’s Orthopedics celebrated the 125th birthday almost.

As before, it remains the country’s leader in one of the most difficult areas - pediatric traumatology and orthopedics.

Today the Institute, continuing the glorious traditions, develops innovative diagnostic technologies, surgical treatment and rehabilitation of children with orthopedic disorders, sequelae of trauma and burns, which are pioneering and widely implemented not only in the national health care system, but also in foreign clinics.

The Institute has long been a school of pediatric orthopedic and trauma surgeons. The former students of the Turner Institute lead the research institutes and departments in the regions of Russia and the former Soviet Union, manage the children's departments and centers as well as are involved in the organizational service.

Annually more than 6000 children from different cities of Russia and near abroad receive surgical treatment at the Turner Scientific Research Institute for Children’s Orthopedics under the Ministry of Health of Russia. More than 20 thousand small patients are provided with consulting assistance.

The Institute established the only Federal Children’s Center for spine and spinal cord injuries in the country, the Center for the treatment of children with orthopedic sequelae of spina bifida, the Center for arthrogryposis. The problems of hip replacement in adolescents are being actively developed; the surgeons began to apply ORTO-SUV devices of the new generation based on computer navigation for transosseous osteosynthesis; the largest experience of microsurgical operations has been accumulated; a neuro-orthopedic approach to the treatment of children with cerebral palsy, neuromuscular and systemic diseases has been developed, and a unique department of oral and maxillofacial surgery has been opened.

International scientific and clinical cooperation is actively developing. The specialists of the Turner Institute present the reports in many European cities and all around the world, participate in the congresses such as EPOS and SICOT; go to study in the leading clinics in Europe and teach colleagues from abroad. On the basis of scientific and clinical achievements, inventive activity, the Educational Research Schools were registered at the Institute: «Pediatric spine surgery» and «Neuroorthopedics». The scientific and practical journal «Orthopedics, traumatology and reconstructive surgery of childhood» is being published.

In the past years, the Institute was awarded the International Synergy Award for sustainable development in times of crisis. Also over the years, the Institute is the only one in the country that was awarded two “Vocation” Prizes to the best doctors of Russia.