

MINISTRY OF HEALTH OF THE RUSSIAN FEDERATION



ALMAZOV

National Medical Research Centre



RESEARCH



EDUCATION



CLINIC

RESULTS 2019

Dear colleagues and friends,

I am pleased to present the results of our work in 2019, the year preceding the 40th anniversary of Almazov Center. This year gave a new impetus to further innovative development of Almazov Center as a leading versatile research, clinical and educational facility, not only in Russia but also globally. Today, the Center employs over 7,000 people and provides training to more than 2,000 medical specialists and 200 students.

We have built a well-known Russian scientific and teaching school that practices integrated and interdisciplinary approach to solving the most urgent research, practical and educational tasks in medicine based on breakthrough technologies of fundamental importance to the development of the Russian healthcare. As early as 15 years ago, we laid down the principles of translational research and built a system to create innovations and quickly introduce them into healthcare practice and education.

This past year was a remarkable page in the history of Almazov Center as a facility having an exceptional competence in high-quality training of medical staff. Pursuant to the Presidential Order of 5 July 2017 and relevant Government Decree of 13 January 2018 for the implementation of the pilot specialist training program, we enrolled 120 students. Seventy-five second-year students continued their studies. More than 600 clinical residents receive training in 28 specialties at Almazov Center.

Almazov Center has been an active contributor to the national projects Science, Healthcare, Education and Demography. As part of the consortium comprising 11 entities, Almazov Center participated in the competition to create global centers for genomic research, received 8 new grants from the Russian Science Foundation and launched a unique Russian project to create allogeneic CAR-T cells with genome editing technology.

Our Center performs unique cardiac and neurosurgery, implements large-scale programs for heart and bone marrow transplantation, minimally invasive aortic valve replacement and endovascular stent grafting. We successfully develop hybrid surgery, robotic surgery for obstetrics and gynecology, abdominal surgery and oncology. Over the past 2 years, Almazov Center, as part of its regional functions as a national medical research center, has become a recognized expert institution setting the tone in the implementation of the strategy to reduce mortality from circulatory diseases in Russia.

The successfully developing Translational Medicine Cluster grew to include new scientific and educational institutions, business and industrial partners. Cluster Management Company was established to promote the projects of the Cluster and implement its tasks.

Obviously, much remains to be done, and the anniversary year 2020 will be decisive for our fur-



ther development towards the integration of science, clinic and education, and creation of the biomedicine ecosystem in St. Petersburg. Value-added healthcare, patient-oriented approach and the development of smart clinic technologies have become the landmarks of the Center's present and future. The project concerned with digital health and artificial intelligence, to be implemented jointly with partners, should form the basis for a new paradigm of medicine that encompasses high-quality medical professionals and state-of-the-art digital decision support technologies.

The tasks solved by Almazov Center in 2019 went far beyond the traditional scope of scientific, educational and clinical processes. We are on the threshold of exciting endeavors and new achievements and I am confident that 2020, the year marking the 40th anniversary of the Center, will bring to all of us new discoveries and success.

Prof. Evgeny Shlyakhto,
Director General of Almazov Center
Academician of the Russian
Academy of Sciences

Today, Almazov Center is a leading Russian medical center for high-tech care, research, medical education and training.

RESEARCH

Almazov Center has 7 research institutes (over 100 research departments, laboratories and groups) that bring together 880 researchers.

CLINIC

The clinic facilities of Almazov Center comprise the Main Clinical Facility, Rehabilitation Clinic, Perinatal Center, Children's Rehabilitation Clinic and the clinic of the Polenov Neurosurgical Institute.

In 2019, the total number of beds in the clinic was 1,519, including 214 beds in intensive care units.

EDUCATION

The Medical Education Institute of Almazov Center comprises 3 faculties (22 chairs).

The annual number of postgraduates is over 2,000.

The basic higher education program for specialist training in General Medicine has been in place since September 1, 2018.



EDUCATION





Improving of medical care quality strongly depends on the quality of personnel in the healthcare sector which is impossible without specialists ready for multidisciplinary professional activities in various areas of science and technology. Basic medical education with rich research component can serve as the foundation for doctor's training in the field of modern information technologies and implementation of the latest biomedical research results into practice. This kind of education is possible only in the Almazov National Medical Research Center. The exceptional diagnostics, treatment and technological resources of the Almazov Center are supported by research and pedagogical staff and can provide a unique opportunity for advanced medical training of the highest level that meet the needs of the Russian Federation healthcare for a 10-15-year perspective period.

The key points of the educational process in Almazov Center are close integration of science and education and the early involvement of students in clinical practice. The network of scientific and educational events is always avail-

able for students: ongoing seminars, meetings of the Scientific Council, problem commissions, schools and conferences. More than 50 events with international participation are held annually at the Almazov Center.



Medical Education Institute



**Elena Parmon, MD, PhD,
Associate Professor,
Director of Medical
Education Institute**

The Institute includes 3 Faculties (22 chairs), scientific library, and additional departments: Social and Extracurricular Activities Department, Educational Environment Center, Professional Education Department, Educational Process Organization Department and Accreditation and Simulation Center.

More than 500 researchers are involved at the educational activities (theoretical and practical component), more than 80% of teachers have a candidate or doctorate degree in the profile of the subjects.

Faculty of General Medicine

Dean — Galina Kukharchik,
Associate Professor

- Department of Obstetrics and Gynecology
- Department of Anesthesiology and Intensive Care
- Department of Internal Medicine
- Department of Humanities
- Department of Children's diseases
- Department of Infectious Diseases and Microbiology
- Department of Laboratory Medicine and Genetics
- Department of Radiology and Medical Imaging
- Department of Mathematics and Natural Sciences
- Department of Human Morphology
- Department of Neurology and Psychiatry
- Department of Pathology
- Nursing Department
- Department of Urology with Robotic Surgery Course
- Department of Physiology
- Department of Surgical Diseases

Faculty of Higher Qualification Specialist Training

Dean — Gennady Kosyakov,
DSc (Philology)

- Department of Cardiology
- Department of Neurosurgery
- Department of Public Healthcare
- Department of Cardiovascular Surgery
- Department of Nuclear Medicine and Radiation Technologies

Faculty of Biological Sciences

Dean — Olga Kalinina, DSc
(Biology)

- Department of Biology



SPECIALIST PROGRAM

On September 1, 2018, Almazov National Medical Research Center welcomed its first students with a matriculation ceremony to signify their acceptance into the higher education program for specialist training in General Medicine.

A total of 75 students from 24 Russian regions were matriculated at the ceremony, now there are 195 students. The number of applicants per place was 13. In 2019, Almazov Center admitted 120 students- 28 men and 92 women- from 29 regions of the Russian Federation, among them the citizens of St. Petersburg, Leningrad Region, Republic of Belarus and Kazakhstan. The final average score for applicants in 2019 was 288 points. In 2019, Almazov Center for the first time accepted students to places of targeted training, the main customers were St. Petersburg, Leningrad and Pskov regions.

Educational process of specialist program is dynamic and rapidly developing in accordance with the modern world requirements: starting from the earliest stages of education, in the close integration of fundamental and clinical disciplines, the implementa-

tion of problem-oriented education into clinical practice. This is also ensured by the presence of unique specialists who are equally involved in fundamental science and practical medical care which makes it possible to teach in deep integration of theoretical knowledge and practical skills.

There are many benefits for students at Almazov Center: early involvement in clinical practice, research, creative and experienced instructors and mentors, small group training. Exceptional treatment, diagnostic and technological resources of the clinic supported by a qualified teaching staff will provide advanced training of the highest-level medical specialists for 10–15 years to come.

The implementation of the specialist program “General Medicine” is a breakthrough project demonstrating a new model of medical education. This new model involves the modernization of infrastructure, a significant change in the psychology of students and teachers, as well as new mechanisms for career guidance, especially for talented children.





Solnechny Scientific and Educational Medical and Biological Center for Gifted Children and Youth

Not long ago Almazov National Center was given the opportunity to implement innovative educational projects after the land and complex of buildings transfer in Solnechny village in the Kurortny district of St. Petersburg.

The Center development is aimed at gifted children and youth. The creation of a “biomedical youth innovative city” has the potential for training for not only gifted children, but also teachers to work with.

The educational process at the Center is planned to unite biomedical area with the involvement of leading scientists, research laboratories, international scientific schools supporting career guidance work, early immersion of students in research field and attraction points for youth sciences.

Involvement of technical universities in work with gifted children and youth will allow developing a project approach in training, forming interdisciplinary connections, and broaden their horizons.

Solnechny Center is located at the resort area close to St. Petersburg that is possible to organize not only training, but also recreation and cultural leisure for children in one of the most beautiful cities on the planet.

The facility infrastructure includes comfortable living conditions organized as studio apartments, as well as classrooms and laboratories, convenient co-working areas, food courts, and medical care units. It is planned to conduct specialized team rotations, summer schools, centralized competitions, workshops, conferences and seminars in Solnechny Scientific and Educational Medical and Biological Center.

The main goal is to create a comfortable modern educational environment for building an individual way for each student perspective.

Our education strategy involves the earliest possible career guidance and the formation of an individual educational perspective for students, creation of an ecosystem of innovative biomedical education according to the international trends on gifted children carrying out project and scientific activities under the guidance of world leading experts.

This approach can become an example of a new model of world-class scientific and educational biomedical center that fully complies with the objectives of the National projects “Science”, “Education” and “Healthcare”.



The main building in Solnechny Center

The accommodation block in Solnechny Center



Clinical Residency

Educational Fields:

- Obstetrics and Gynecology
- Anesthesiology & Resuscitation
- Transfusiology
- Clinical Laboratory Diagnostics
- Laboratory Genetics
- Pathology
- Radiology
- Medical Imaging
- Ultrasound Diagnostics
- Functional Diagnostics
- Pediatric Cardiology
- Pediatric Surgery
- Pediatric Endocrinology
- Neonatology
- Pediatrics
- Hematology
- Cardiology
- Physiotherapy and Sports Medicine
- Neurology
- Rheumatology
- Therapy
- Endocrinology
- Neurosurgery
- Endovascular Diagnostics and Treatment
- Cardiovascular Surgery
- Surgery
- Urology
- Healthcare Management and Public Health

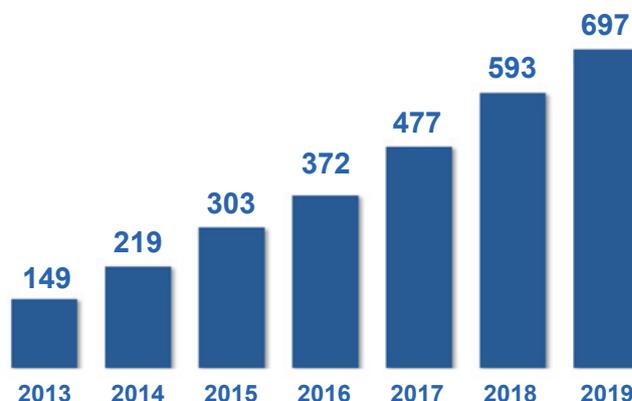
Residency training provides:

- Large number of practical courses, including practical skills practice at the innovative Accreditation and Simulation Center;
- Involvement of leading academic teachers and experienced clinicians;
- Own research project, its defense can be performed during the Young Scientists and Specialists Conference.

In 2019, the applicants number for residency amounted to 386 people from 79 regions of the Russian Federation that is 11% more than in 2018.

The number of applicants per place is constantly increasing, in 2019, in some specialties it amounted to 82 applicants for state-funded studies and up to 28 applicants for non-state-funded studies.

Number of trainees in residency programs in 2013-2019



PhD programs

PhD Focus Areas:

- **Clinical medicine**
Obstetrics and Gynecology
Anesthesiology and Intensive Care
Hematology and Blood Transfusion
Pediatric Surgery
Cardiology
Clinical Laboratory Diagnostics
X-ray diagnostics and Therapy
Nervous diseases
Neurosurgery
Pediatrics
Rheumatology
Cardiovascular surgery
Endocrinology
- **Fundamental Medicine**
Clinical Laboratory Diagnostics
Pathology
Pathological Physiology
- **Biological Sciences**
Cell Biology, Cytology and Histology

More than 100 PhD students are studying at the Almazov National Center, including citizens of the CIS and other countries. The average number of applicants per place is 2.5 for state-funded studies. The most important roles in this contest is given to the applicants' personal achievements and research work.

For their research, graduate PhD students have a unique laboratory and instrumental base, rich scientific library and technical equipment with a wide range of patients' nosological forms at the Center's clinic.



Additional Professional Education Training

In 2019, 24 professional training programs and more than 150 continuing education programs were implemented as higher qualification specialist training. More than 2,000 specialists attended professional retraining programs, more than 200 of them were from various regions of the Russian Federation, as well as neighboring countries and abroad: the Republic of Belarus, Georgia, Kazakhstan, Tajikistan, Mongolia, China, etc.

Also, in 2019, 17 interdisciplinary educational events were accredited by the continuing medical education system, including scientific and practical conferences, schools and seminars at the Almazov National Medical Research Center.



Accreditation and Simulation Center

Accreditation and simulation center combines 3 divisions:

- Simulation Methods Sector
- Simulation Methods on Living Tissues Sector
- Certification and Accreditation Department

The main strategy of the Simulation Center is to form and support students' optimal sensory-motor skills in surgical interventions and medical procedures; diagnosis and emergency care; develop individual practical manipulations and clinical team approach and algorithms for difficult clinical situations, integrated emergency care skills using innovative training technologies.

The Accreditation and Simulation Center is equipped due to the most advanced technologies and world standards, has enhanced medical equipment and instruments: complex of specialized simulators, robot simulators, simulation manikins, electronic phantoms, medical models.

Simulation Center uses the most modern teaching tools and technologies:

- Clinical scenarios with audio and video based debriefing
- Virtual reality training on virtual simulators and interactive VR systems
- Simulated patients and hybrid simulations
- Experimental operating room for practicing surgical skills on large animals.

After modernization and purchase of additional equipment, the Simulation and Accreditation Center is able to solve the most ambitious training tasks not only for medical staff of the healthcare institutions of any level, but also for the citizens, specialists and organizations.

