

This issue is dedicated to Rakhmanbek Toichuev, a scholar, surgeon, and innovator whose research and clinical achievements had significantly influenced the development of medicine and integrative approaches within the healthcare system of the Kyrgyz Republic. The material included a contemporary perspective by a young researcher on the scientific legacy of R. Toichuev, emphasising the scale of his contribution – from the training of generations of specialists and the development of new medical techniques to the formation of scientific schools and the implementation of research findings into clinical practice. The publication was intended to serve as a token of recognition of an outstanding specialist and as a source of inspiration for young researchers who continued the development of Kyrgyz scientific traditions.

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Editor-in-Chief,

Journal of Human Biology and Clinical Medicine

The greatness of a person reflected in their deeds: The role of Rakhmanbek Toichuev in the integration of paediatric surgery, paediatrics, medical ecology, public health of the Kyrgyz Republic, and the development of fundamental science (on the occasion of the 80th anniversary of his birth)

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Rakhmanbek Toichuev was born on 29 November 1945 in the village of Burgondu (now Nokén District) of the Jalal-Abad Region of the Kyrgyz Republic. In 1964, he completed Secondary School No. 2 named after Karl Marx in the Lenin District (now Nokén District) of the Jalal-Abad Region. In 1971, he graduated from the Kyrgyz State Medical Institute in Frunze with a degree in paediatrics. After graduation, R. Toichuev began his medical

practice in 1971 at the Osh Regional Children's Hospital, where he served as an intern doctor – the first in the Kyrgyz SSR to specialise in paediatric surgery. For twenty-three years (1972-1995), his professional activity remained closely connected with this institution, where he progressed from senior resident (1972-1976) to head of the paediatric surgery department (1976-1977 and 1980-1995). During this period, he also fulfilled the

Suggested Citation:

Argynbaeva A, Sakibaev K, Toichueva J. The greatness of a person reflected in their deeds: The role of Rakhmanbek Toichuev in the integration of paediatric surgery, paediatrics, medical ecology, public health of the Kyrgyz Republic, and the development of fundamental science (on the occasion of the 80th anniversary of his birth). J Hum Biol Clin Med, 2025;1(1):8–10.

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duties of chief freelance paediatric surgeon of the Osh Region, providing specialised surgical care to children and contributing to the establishment of the paediatric surgical service in the south of the Kyrgyz Republic.

For the performance of complex surgeries and the saving of children's lives in 1979-1980, a documentary film entitled *Pain* was made about R. Toichuev by the director Tynchtyk Razzakov and the cinematographer Evgenii Baryshnikov, which was considered rare in the Soviet period. In the years 1985-1989, he undertook postgraduate training at the Institute of Paediatrics of the Academy of Medical Sciences of the USSR in Moscow, specialising in paediatric surgery. On 8 January 1991, he defended his PhD dissertation "The biocenosis of the gastrointestinal tract of pregnant women and purulent-septic diseases of newborns and infants" in two specialties: Paediatric Surgery (14.00.35) and Paediatrics (14.00.09), under the supervision of the renowned paediatric surgeon Professor L.M. Roshal (later President of the Research Institute of Emergency Paediatric Surgery and Traumatology and Hero of Labour of Russia). The clinical practice of Rakhmanbek Toichuev was characterised not only by its scale but also by the introduction of original, highly effective surgical and paediatric techniques aimed at substantially improving treatment outcomes in children.

During the period of active surgical practice, more than 5,000 surgical procedures were performed by him. The scope of R. Toichuev's clinical work was exceptionally broad and encompassed virtually all areas of paediatric surgery, including neurotrauma and microsurgical interventions for combined injuries such as urethral rupture with immediate urethral reconstruction, as well as trauma and orthopaedics, urology, oncology, dentistry, and paediatric gynaecology, including the creation of a urinary bladder and an artificial vagina using local tissue. Numerous surgical techniques were developed and implemented by him, including those for congenital malformations. Among the most significant contributions were innovative approaches to the management of purulent-inflammatory and traumatic conditions.

During his internship in 1971-1972, R. Toichuev developed a method of prolonged thoracocentesis that allowed a drain to be maintained at a single point without suppuration of the thoracocentesis site for up to 45 days. In 1972, when managing staphylococcal pyopneumothorax, he introduced a "traction" drainage technique using running water and a compressor, which ensured effective evacuation of purulent-necrotic material. In cases of lung abscesses and pericarditis, a puncture method for placing a micro-irrigator was developed and applied by him, including through Larrey's point in purulent pericarditis. The use of these technologies made it possible to reduce mortality in purulent-destructive diseases of the lungs and pericardium to 1.08%. Particular importance was attributed to the introduction, in 1975, of an osteoperforation

method for acute haematogenous osteomyelitis in children, which reduced the average duration of treatment more than twofold and significantly decreased mortality rates. In April 1976, he introduced a bronchial blockade technique for bronchial fistulas, which markedly reduced the need for thoracotomy and substantially lowered mortality in this group of patients. In 1977, he was awarded the highest qualification category in paediatric surgery for his achievements.

On 24 November 1994, he was appointed as the organising director, and on 5 October 1995 he was elected Director of the Institute of Medical Problems (IMP) of the Southern Branch of the National Academy of Sciences of the Kyrgyz Republic (NAS KR). The institute had been established by Order No. 22/11 of 28 November 1994, based on the resolutions of the Presidium of the NAS KR dated 29 December 1993 (No. 3, "On the Establishment of New Institutes") and the decisions of the Bureau of the Southern Regional Branch of the NAS KR dated 23 September 1991 (No. 5/6) and 28 November (No. 6/1).

While serving as Director from 1995 until September 2017, the Institute of Medical Problems developed, under his leadership, a full production cycle for surgical suture materials made from the serosa of small and large cattle (catgut) and from silkworm cocoons (silk). The authors of this development were R. Toichuev, E. Tostokov, and N. Toichuev, all holding the degree of PhD in Medical Sciences. These technologies were introduced into industrial production, and he became the only scientist who succeeded in transferring a scientific development into full-scale manufacturing. According to R. Toichuev, "As a scientific institute, we had to develop the entire production cycle of catgut and silk from scratch". A patent and a full set of documents required for establishing production and further implementation of the innovative products, carried out on a tender basis, were obtained. In addition, under his supervision, a technology for producing bifidumbacterin and colibacterin from local strains was developed.

Since February 2018, R. Toichuev had served as a leading research fellow at the Institute of Mountain Physiology and Medicine in the Department of Medical Problems, and from April 2022 he was transferred to the position of leading research fellow and, on a voluntary basis, appointed Deputy Director of the Research Institute of Biomedical Problems. R. Toichuev had worked in the healthcare system for more than fifty-five years. During this time, he trained more than 170 specialists in paediatric surgery, who subsequently practised in the Federal Republic of Germany, Greece, Israel, and the countries of the Commonwealth of Independent States. Under his supervision, three individuals obtained the degree of PhD in Medical Sciences, and during his tenure as head of the Institute of Medical Problems, ten doctoral dissertations and more than fifty PhD dissertations in various fields were defended. He published scientific studies and their findings in six hundred

scholarly works, including more than four hundred articles abroad, among them in the United States of America, France, the Czech Republic, the Republic of Korea, Ireland, Canada, Spain, Switzerland, Singapore, Turkey, Romania, Belarus, Georgia, Moldova and other countries. He developed advanced integrative methods for research and student training, and authored one monograph and seven methodological guidelines.

R. Toichuev was the author of thirty inventions, three of which had been developed upon the request of the International Science and Technology Centre. He received one hundred and thirty authorship certificates and acknowledgements for more than one hundred and twenty rationalisation proposals that had been introduced into production and applied in practical medicine in the Kyrgyz Republic and the countries of the Commonwealth of Independent States. He developed more than seventy methods for the prevention and treatment of various diseases using therapeutic agents derived from local raw materials and biopreparations obtained from local strains. He also created methods for the treatment of typhoid fever and typhoid carrier states, as well as techniques for eliminating chlorinated organic pesticides from the gastrointestinal tract, which were applied in the treatment of children and their mothers.

In addition, R. Toichuev proposed to the scientific community the concept of a theoretical medico-biological science, formulated the laws of renewal and equilibrium of the relative relativity of the avatar and the informational creator of the energy "Zhanai", and further elaborated the principles of triplicity. He was included in a group of scientists under the World Health Organization, consisting of forty-three leading specialists worldwide who worked on issues of primary health care for patients with coronavirus infection. He also delivered scientific reports in more than forty countries on topics related to medicine, ecology, biology, biosafety, biosecurity, and economics. In 2020, through the General Assembly of the International Pollutants Elimination Network (IPEN) under the United Nations, R. Toichuev was included in a global working group of three thousand leading scientists, prominent politicians, and major business representatives who addressed issues of climate change, environmental pollution, cyber- and biosecurity, bio-protection, and the prevention of future biological threats.

R. Toichuev served as a member of the editorial board of the scientific journal *Paediatric Surgery* of the Russian Federation and actively participated in the work of leading professional communities and international organisations. He was a member of the Association of Paediatric Surgeons of Russia and the Commonwealth of Independent States, as well as a member of the international organisations ISES–ISEE, the General Assembly of IPEN, and the Association of Infectious Disease Specialists of the Kyrgyz Republic. He also acted

as a representative of the International HCH and Pesticides Association. In addition, he was part of the Executive Committee of the Association for Biosafety of Central Asia and the Caucasus and was a member of the Association for Bioethics of Eastern Europe, the Caucasus, and Central Asia.

As of 2025, R. Toichuev engaged in the training and education of young researchers, specialists, postgraduate students, applicants, and students, applying his own integrative methods developed at the intersection of chemistry, physics, biology, mathematics, geometry, informatics, the social sciences, and cognitive science. These methods contributed to the development of perceptiveness, logical thinking, and creative potential among learners. For his international contribution and outstanding achievements in medicine, as well as for his active expert work, R. Toichuev was awarded a number of honorary distinctions: in 2002, the honorary title of Distinguished Worker of Science of the National Academy of Sciences of the Kyrgyz Republic; in 2004, the honorary title of Distinguished Worker of Healthcare of the Kyrgyz Republic; in 2013, the academic title of Professor of the Russian Academy of Natural Sciences (Professor's Diploma of the Academy of Natural Sciences, Moscow); and in 2024, the badge "Excellence in Science".



Visit of the institute by a Canadian delegation (2009)



R. Toichuev together with the internationally renowned paediatric surgeons of the Russian Federation, L. Roshal – President of the Research Institute of Emergency Paediatric Surgery and Traumatology, Professor and Doctor of Medical Sciences, Academician – and V. Shafranov, Professor of the Department of Paediatric Surgery of the N. Pirogov Research Institute and Doctor of Medical Sciences