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**A Russian Perspective on the Learning Curve in Neurosurgery**

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Neurosurgery is one of the most difficult specialties in medicine. Thus, continuous improvement of your theoretical knowledge and practical skills is required throughout the whole of your career. As a neurosurgeon and head of a neurosurgical hospital in Novosibirsk, a city located in the center of Russia, on the border between east and west, I would like to share my experience of implementing neuromodulation technologies into my routine surgical practice.

I first became familiar with neuromodulation technologies during the summer of 2003. I was visiting the headquarters of large medical company in Minneapolis. Among other things, this medical company produces and promotes neuromodulation technologies. The visit took only one day, but I immediately became interested in this technology. Thanks to a lucky chance, that same summer, I met with Konstantin Slavin, MD, FAANS, who is a professor in the department of neurosurgery at the University of Illinois at Chicago; at that time, he had just graduated from his fellowship in functional surgery, and he was actively doing surgery for treatment of heavy pain syndrome and movement disorders. While I was visiting the university hospital

where he works, Dr. Slavin explained this method of treatment to me with a passion.

### **Implementing Neuromodulation in Russia**

After my return to Russia, and during my fellowship there, I found that techniques such as spinal cord stimulation and deep brain stimulation were practiced in just a few hospitals – frankly speaking, only in one central neurosurgical hospital in Moscow, the Burdenko Neurosurgery Institute. Examining the cause of this sad situation, I came to understand that there were two main problems that prevented the integration of neuromodulation technologies into wider practice in Russia. The first cause was the fact that the Russian medical community was poorly informed about the possibility to help patients with heavy neurological diseases using neuromodulation methods; and the second cause was the extremely high cost of the devices.

I met with the leader of this field in Russia, Professor Shabalov. After observing training in his hospital, the Burdenko Neurosurgery Institute, I suggested to Professor Yuri Shulev that he begin practicing this field of neurosurgery. Our collaboration during 2004 to 2005 resulted in my operating on one patient with heavy pain syndrome as a complication of a bullet wound to the spine. Why had I found only one patient? The problem lay in the high cost of the device in a situation where the state system and the insurance system didn't cover the expense of such high-cost implants.

From 2006 to 2007, a few of my colleagues who shared the same views and I organized a society for patients with neuropathic pain. On behalf of this society, we petitioned the ministry of state health care to consider starting a special program to help these patients by organizing a separate budget to satisfy their needs by providing special devices. Our efforts succeeded. By the end of 2007, a separate budget for the purchase of high-cost devices was accepted in the state health-care system.

### **Making Progress**

However, I then encountered another difficulty: Nobody was sending me patients. My neurologist colleagues didn't understand why we needed all this if we still could treat patients with pain or movement disorders traditionally. I despaired a few times, thinking I wouldn't be able to find patients for my clinic. Once again I got support from Dr. Slavin, who explained that he was encountering the same problem in Chicago. He advised me to be patient and, step by step, to make more contact with neurologists.

Within half a year, there wasn't a hospital or clinic in St. Petersburg, Russia, where I didn't present lectures on spinal stimulation or deep brain stimulation. Gradually, the amount of patients increased, and simultaneously, the budget created by state health care for patients with heavy pain syndrome and movement disorders also increased.

Several times, my colleagues and I visited hospitals in the United States and Europe where neuromodulation techniques are practiced daily. In October 2010, I was invited to the hospital of University of Sofia, Bulgaria, to mentor in these procedures. Then, in December 2011, my colleagues in St. Petersburg and I organized the National Neuromodulation Society, and currently, we are waiting to become part of International Neuromodulation Society. Ultimately, in May 2012, I became head of a specialized neurosurgical hospital in Novosibirsk, where there is a department of functional neurosurgery and where we are actively practicing neuromodulation technologies.

Using my experience, I have just tried to demonstrate that everything is in our hands; if we wish, we can solve any professional task. The main principle is the final result of any task in or around medicine will be the improvement of patients' quality of life.

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Jamil Rzaev, MD, PhD, is head of the Federal Neurosurgical Center in Novosibirsk, Russia. His professional interests include neuromodulation, functional neurosurgery, skull base surgery and facial pain. The author reported no conflicts for disclosure.