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In Memoriam: Valerii Semenovich Ponomarchuk

It is with deep regret that we share sad news of the passing of Professor Valerii Semenovich Ponomarchuk, Head of the Functional Diagnostics Department at the Filatov Institute of Eye Diseases and Tissue Therapy, Dr Sc (Med) and Merited Doctor of Ukraine, who died on 12 September 2023.

Valerii Semenovich was born on June 2, 1948, in Mykolaiv region, Ukraine. After completing his secondary school education, he went on to Odesa Medical School in 1964 which he graduated with Honors to become a medical assistant. After graduating with Honors in General Medicine at the Pirogov Odesa Medical Institute, he began his career as a junior researcher at the Functional Diagnostics Laboratory, the Filatov Institute of Eye Diseases and Tissue Therapy, in 1974. Valerii Semenovich was promoted to senior researcher and head of the Functional Diagnostics Department in 1987, and remained at the head of the department until his death. His first significant academic achievement was defending his Cand Sc (Med) thesis, *Loss of Intraocular Pressure Control Secondary to Effects Exerted on Limbic System Structures*, in 1981. He defended his doctoral (Dr Sc (Med)) dissertation, *Early Functional Changes in the Visual System and the Pathological Mechanisms of These Changes in Autonomic Nervous System Dysfunction*, in 1995, and was awarded the title of professor in 1998.

Professor Ponomarchuk was academic secretary for the Dissertation Defense Council specializing in ophthalmology, from 1996 to 2006; expert of the State Dissertation Defense Board in clinical medicine, from 2006 to 2012; and expert of the State Commission for Academic Degrees and Titles at the Ministry of Education, Science, Youth and Sport of Ukraine in clinical medicine (surgical disorders), from 2012 to 2014. In 2002, he was elected a Vice-President of the Ukrainian Ophthalmological Society.

His research and practical activities were focused on the physiology of vision, early functional diagnosis of disorders of the eye and visual system, and efficacy of treating various eye diseases with low-intensity physical stimuli (e.g., electric stimulation, photic stimulation and muscle stimulation). Professor Ponomarchuk also conducted studies on the effects of autonomic nervous system dysfunction on the eye, and the results of these studies laid down the foundation for a new area of ophthalmology, vegetoophthalmology. He developed various sets of techniques (electrophysiology techniques; studies of the central and peripheral fields of vision, cerebral and ocular circulation, and light sensitivity) for pre-clinical diagnosis of visual system disorders and comprehensive color vision evaluation. These techniques



are successfully used at the Filatov institute and many eye centers of Ukraine.

Professor Ponomarchuk was an active inventor. In 1988, he began his collaboration with engineers of “Shtorm” Research Institute to develop a number of diagnostic and treatment devices (ophthalmological electric and photic stimulators “Fosfen”), which have been introduced in clinical practice and are now used in more than 250 locations in Ukraine and abroad. Valerii Semenovich originated the idea of phosphene effect-based electrodiagnostics of the major visual pathways in the mid-seventies, and since then, has been developing and implementing it into practice. At that time, the electrophysiology group at the Functional Diagnostics Laboratory used a 10-year-old diagnostic electric-pulse stimulator ELS-01. The outward appearance and methodological value of the device deteriorated year by year. In addition, attendees of laboratory-based refresher courses for ophthalmologists agreed that the methodology was appropriate but were dissatisfied that the device was not available on the market. In order to address their concern, Valerii Semenovich originated the idea to develop at least several diagnostic electric simulators. A technical design assignment for the device was developed, and Volodymyr Andriiovych Ivanov, a design engineer of “Shtorm” Research Institute, designed the device on the basis of this assignment. In 1988, a diagnostic electric-pulse stimulator was developed and named “Fosfen”

(Phosphene) to denote the phenomenon employed in the operation of the device, a sensation of light produced by the effect of pulse current on the eye.

The device has been successfully applied in the diagnostic assessment of tens of thousands patients with various eye and central nervous system diseases in various conditions of professional activity. Electric sensitivity of the visual system and critical frequency of phosphene disappearance were determined in patients with optic nerve atrophy, retinal disorders, ocular trauma and burns, amblyopia, refractive and accommodative abnormalities, systemic and regional vegetative dysfunction, etc.

During thirty subsequent years, the device was improved with new functions and parameters that offered new diagnostic capabilities. Various types of "Fosfen" electric simulators were developed not only for diagnosis, but also for treatment of a number of visual system disorders. Since 1995, these ophthalmological stimulators have been twice exhibited and awarded a silver medal at the Exhibition of Economic Achievements of Ukraine in Kyiv.

Hundreds of papers have been published, and dozens of reported have been presented at national and international conferences, and a number of Cand Sc (Med) theses and doctoral dissertations have been written by Valerii Semenovych and his colleagues on the basis of studies on the efficacy of a new method of diagnosis ("phosphene diagnostics") and treatment ("phosphene stimulation").

Professor Ponomarchuk published around 300 articles, four monographs, and authored or co-authored 21 patents. He presented at numerous international conferences and congresses and published papers in journals in Bulgaria, Hungary, Poland, Russia, Spain, Italy and Germany.

He was renowned for his unwavering commitment to mentorship of Ukrainian and foreign students, postdoctoral fellows, young investigators, and/or trainees specializing in ophthalmology. From 1998 to 2018, ten individuals (including those from India, Ghana, Syria and Tunis) completed their Cand Sc (Med) degrees, and one, a Dr Sc (Med) degree, under the supervision of Prof. Ponomarchuk. In addition, he reviewed 15 doctoral dissertations and 76 Cand Sc (Med) theses.

Valerii Semenovych was successful in combining his research and clinical activities with mentorship and public activities. For years he has been delivering lectures and training sessions on physiology of the eye and methods of functional studies of the eye to doctors, post-graduate students, residents and students. From 1995 to 2000, he was professor at Physiology Department at the Mechnikov Odesa National University, with 37 term and diploma papers completed and defended under his supervision.

For decades Professor Ponomarchuk has been editorial board member of the Journal of Ophthalmology (Ukraine). He has been involved in studying medicine and conducting healthcare activities at the city of Odesa for almost sixty years.

Valerii Semenovych was a nice and bright person, gifted and hardworking scientist, wonderful clinician and talented mentor. He was admired for his kind heart, the way in which he cared about other people, brilliant mind, outstanding knowledge and hard work. His colleagues, pupils, listeners and patients respected him as a person of high professionalism and expertise, and great erudition and empathy.

We extend our heartfelt condolences to the family and friends of Professor Ponomarchuk. Valerii Semenovych will truly be missed and will live in our hearts forever.

*The collective
of the State Institution "The Filatov Institute of Eye
Diseases and Tissue Therapy of the National Academy of
Medical Sciences of Ukraine"*