



Fund “Nauka” Project № 20009 Resume – Competition-Based Session 2020:

“Ergonomics in the microsurgical operating room – impact on postoperative results and quality of life of the surgeon”

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Microsurgical interventions become more and more widespread in the medical practice and include surgical procedures in the field of vascular surgery, neurosurgery, cardiac surgery, maxillofacial surgery, otorhinolaryngology, dermatology and others. Labor on the operating microscope requires a specific, forced position of the body: a stable position of the arms and an upright position of the spine. Providing conditions for ergonomic body position during microsurgery could only be achieved and controlled by introducing high-tech ergonomic operating furniture developed particularly for this purpose.

The purchase and application of these surgical chairs will create conditions for qualitative and quantitative changes in the surgical results embedded in previous projects, as well as in the subjective feelings of the staff.

The implementation of the project will contribute to the establishment of a high-tech center for clinical work and training, which will carry out a full range of high-tech, micro-invasive, microsurgical interventions. This project is a sequel of a previous one (№ 18006 “Creation of infrastructure for high-tech, minimally invasive treatment of cataracts and complex pathology of the anterior segment and interactive and distance learning at all academic levels”) in order to complete the training cycle of graduates, young scientists and ophthalmologists. Microsurgical interventions are characterized by a high degree of complexity and the postoperative results are directly influenced by the human factor. In ophthalmology, implantation is widely used, as well as transplantation of allo- and auto-tissues, cells and products, and the time for performing these procedures increases in direct proportion to their complexity.

In its many forms, microinvasive surgery can compel eye surgeons to take forced postures that have detrimental long-term effects on physical health by inducing musculoskeletal fatigue. Together with the dynamically developing technologies in healthcare and the introduction of highly specialized equipment, the prevention of occupational diseases of the staff in the operating room is becoming increasingly difficult. The nature of surgery requires knowledge of the basic ergonomic principles as well as the organization and observance of all modern preventive measures related to occupational hygiene.

Objective: Creation of a high-tech university infrastructure for medical, educational and research work for the prevention and treatment of socially significant eye diseases, providing healthy and ergonomic conditions for performing microsurgical interventions.

Methods:

Creating a high-tech university infrastructure for medical, teaching and research work in order to help solve current problems for modern science. Conditions will be improved and risk factors leading to disability and deteriorating quality of life will be reduced for both patients and healthcare workers.

Tasks:

1. Study of the effect of forced posture during microsurgical surgery;
2. Finding the optimal solution and purchasing modern operating equipment that is in line with and meets the recommendations to employers, based on available good practices in the English sources;
3. Evaluation of the effectiveness of treatment in the management of patients in need of transplantation and implantation medicine;
4. Upgrading and improvement of the already implemented project № 18006 “Creation of infrastructure for high-tech, minimally invasive treatment of cataracts and complex pathology of the anterior eye segment and interactive and distance learning at all academic levels”;
5. Comparison of the postoperative results of surgically treated for eye pathology patients with and without the presence of high-tech, ergonomic operating furniture;
6. Assessment of the mental and physical condition of the surgeon on the basis of a specially developed questionnaire, comparing the answers of the participants in it before and after the introduction of high-tech, ergonomic operating furniture;
7. Application of the modern method (RULA) for assessment of the forced position of the eye surgeon in order to establish the main risk factors for the development of musculoskeletal deformities and to develop methods for their timely correction;
8. Creation of the first parallel high-tech center in Bulgaria with the ability for distance learning through high-tech equipment;
9. Development of the first research projects of young scientists.

Achieved results:

- ❖ Purchase of the latest generation of ergonomic operating furniture Haag-Streit Combisit L. The equipment is part of the first in Bulgaria University Center for Eye Health, as part of the training and diagnostic center for training students, PhD students and graduates;
- ❖ Reception and installation of highly specialized operating furniture;
- ❖ Testing for serviceability and commissioning;

- ❖ Presentation and training for operation by the representative of the distributor company;
- ❖ Training of the members of the Department of Ophthalmology and Visual Sciences;
- ❖ Development of the first research projects of young scientists;
- ❖ Forming a team to be responsible for the organization of the project;
- ❖ Preparation of a plan related to the implementation of the preparation for the implementation of the activities, control, monitoring, internal evaluation and reporting during the implementation of the project;
- ❖ Familiarization of all team members with their job descriptions;
- ❖ Accurate and clear definition of their actions and obligations, as well as the responsibilities they assume in the implementation of the project.

Perspectives and opportunities for future development of the research activity in MU - Varna, as a result of the project implementation:

- ❖ Ergonomic operating furniture has exceptional opportunities for in-depth study of a wide range of diseases and disorders of the musculoskeletal system of ophthalmic surgeons;
- ❖ Establishment of a high-tech center for clinical work and training, which will carry out a full range of high-tech, micro-invasive, microsurgical interventions. The project will be associated with an existing one (№ 18006, won funding from Fund “Nauka” of the Medical University of Varna in 2018, on the topic: “Establishment of high-tech infrastructure for minimally invasive cataract treatment and complex pathology of the anterior ocular segment, and interactive and distance learning at all academic levels”) in order to complete the training cycle of graduates, young scientists and ophthalmologists;
- ❖ The availability of highly specialized, ergonomic operating furniture of the latest generation will open new opportunities for research activities of MU-Varna in the next 10 years after the project. Directions of future developments are:
 - “Comparative characteristics of the postoperative results before and after the use of highly specialized, ergonomic operating furniture”;
 - “Carrying out screening, monitoring changes in the presence and absence of highly specialized, ergonomic operating furniture and identifying risk factors for damage to the upper extremities, which will allow a systematic assessment of postural risks for the ophthalmic surgeon. Preparation of a plan for prevention and prophylaxis”;
 - “Preparation of comparative characteristics of the professional growth of young ophthalmic surgeons in the operation of the completed simulation”;
 - Replication of the model in other microsurgical specialties.