American Journal of Medicine and Medical Sciences 2026, 16(6): 2778-2782
DOI: 10.5923/j.ajmms.20261606.03

# Organization of High-Tech Neurosurgical Care and Assessment of Quality of Life for Patients in the Navoi Region

**Dilshod Ochilovich Berdiev**

Navoi Regional Multidisciplinary Medical Center, Deputy Chief Physician for Surgical Issues, Neurosurgeon, Republic of Uzbekistan

**Abstract** This article presents the historical aspects of the development and organization of neurosurgical care worldwide, neurosurgical treatment of trigeminal neuralgia, modern methods of neurosurgical treatment of brain tumors, a review of the effectiveness of modern methods for treating lumbar intervertebral disc herniations, and a differentiated approach to the treatment of neurosurgical patients. Quality of life and pain syndrome are assessed using questionnaires. Determining the effectiveness of surgical treatment and its impact on patients' quality of life.

**Keywords** Trigeminal neuralgia, Surgical treatment, Brain tumors, Intervertebral disc herniation, Complicated monitoring, Differentiated approach

## 1. Introduction

The history of neurosurgery is very ancient, and its origins are lost in the mists of time. Before civilization developed in the valleys of the Nile, Tigris, Euphrates, and Indus rivers, tribes roamed Western Europe during the Neolithic period, approximately 7000 BC. Skulls with trepanned holes were discovered in burials in the 17th and 19th centuries [1,2,6,9,11].

Modern neurosurgery is one of the newest branches of surgery, having developed over less than 100 years. For several centuries, surgery of the nervous system developed within the broader framework of general surgery, and only comparatively recently has neurosurgery emerged as an independent discipline [2,9,11].

In recent years, neurosurgical departments have employed new diagnostic and treatment methods for patients with brain tumors. Non-invasive diagnostic methods make it possible to detect this disease at early stages. Surgical interventions are now performed using microscopy, neuronavigational, stereotactic imaging, ultrasound, and endoscopy. In modern medicine, the primary criterion for assessing treatment outcomes is the patient's quality of life [3,4,5,7,8,10,12].

The introduction of modern diagnostic methods such as multisite computed tomography (MSCT) with the ability to subsequently process the obtained data to generate multiplanar reconstruction (MPR) and 3D reconstruction images has increased the sensitivity and accuracy of detection [1,2,5].

Quality of life assessment is increasingly being used in clinical medicine because it allows for the study of the impact of the disease on various components of the patient's health and the identification of additional benefits or drawbacks of the treatment. The introduction of advanced quality of life assessment methods into clinical practice has provided access to important information about aspects of patient functioning. This data can be used in the development of treatment and rehabilitation programs and in monitoring the patient's condition during treatment [3,7,8,12].

**Purpose of the research**

The goal is to improve neurosurgical treatment outcomes and patient quality of life through a differentiated approach and the use of high-tech neurosurgical care.

## 2. Materials and Methods

This scientific study presents the results of an analysis of 314 patients with neurosurgical diseases treated in the regional multidisciplinary medical center of the Navoi region between 2018 and 2024.

Our differentiated approach to treatment tactics was based on the clinical presentation, objective instrumental examination indicators, the severity of neurological signs, and the assessment of patient consciousness using the Glasgow Coma Scale and other methods.

To assess quality of life, we used the EuroQol-5D European Quality of Life Questionnaire and the Visual Analogue Scale

* Corresponding author:
doctordilshod@gmail.com (Dilshod Ochilovich Berdiev)
Received: Apr. 23, 2026; Accepted: May 16, 2026; Published: Jun. 1, 2026
Published online at http://journal.sapub.org/ajmms

(VAS) to determine pain intensity, both of which had undergone a standard validation procedure.

## 3. Results and Discussion

In our study, 314 patients were divided into four groups based on their clinical manifestations for ease of comparison. The first group included 117 patients (37.3%), including 97 (31%) who presented for the first time with brain tumors and 20 (6.4%) with spinal cord tumors who underwent surgery to remove their brain and spinal cord tumors.

The second group included 82 (26.1%) patients with degenerative spinal diseases who underwent surgery to remove a herniated disc.

The third group included 57 patients (18.1%), including 46 (14.6%) with spinal cord injury sequelae and 11 (3.5%) with traumatic brain injury sequelae, requiring rehabilitation care.

In our studies, functional and other diseases were classified in the fourth group, accounting for 58 patients (18.5%). These included trigeminal neuralgia (16 cases, 5.1%), vascular diseases of the brain and spinal cord (14 cases, 4.4%), as well as congenital anomalies of Arnold-Kiari type 1 (1/25 cases), brain cysts (2 cases), and spinal scoliosis (1 case), representing 28 (8.9%) of the total number of observations.

The fourth group, along with functional neurosurgical diseases, also included congenital anomalies of Arnold-Chiari type 1 (1/25 cases), brain cysts, and one case of congenital scoliosis of the spine.

In our studies of 314 patients in all four groups, treatment was differentiated based on the clinical manifestations of neurosurgical diseases, using high-tech interventions. During the epidemiological phase of the study, it is necessary to clarify the geographical location and demographic situation in the region.

Patients with primary brain tumors present with a diverse clinical picture, characterized by the development of both focal and general cerebral symptoms. The onset of symptoms depends on the rate of spread and the location of the lesion, which often leads to late detection of the disease.

The degree and type of neurological impairment depends solely on the location of the tumor in specific CNS structures and their functional significance. Currently, CNS tumors are often detected by MRI or MSCT imaging and other diagnostic methods.

By age, patients are classified according to the WHO classification, which provides for the following age groups: young age (14-19 years); younger middle age (20-44 years); older middle age (45-59 years); elderly age (60-74 years); old age (75-89 years); In our observations, patients ranged in age from 24 to 79 years. Given this, the patient distribution by age group is as follows.

In the first group, the age and gender distribution of 117 patients (37.3%), including 97 (31%) with brain tumors and 20 (6.4%) with spinal cord tumors, showed that women predominated among the patients: 71 (60.6%), while men accounted for 46 (39.4%), which is 1.5 times less than women. The majority of patients (48 (41.0%) were middle-aged or elderly, with the largest number of patients (36 (30.7%)) in the 50-64 age group, which is consistent with data from international scientists.

In the second group, the age and gender distribution of 82 (26.1%) patients with degenerative diseases complicated by lumbar disc herniations showed that men predominated among the patients (58 (70.7%)) and women (24 (29.3%)), which is related to the physical strain men experience during work. The majority of patients (34 (41.5%) were middle-aged and elderly, with the largest number of patients (25 (30.5%)) in the 50-64 age group, consistent with data from international researchers.

In the third group, the age and gender distribution of 57 (18.1%) patients requiring rehabilitation care showed that men predominated among the patients (40 (70.2%)) and women (17 (29.8%), which is related to the physical strain men experience during work. The majority of patients (23 patients, 40.3%) were middle-aged or elderly, with the largest number (18 patients, 31.6%) in the 50-65 age group, consistent with data from international researchers.

In the fourth group, age and gender distribution of functional and other neurosurgical diseases (58 patients, 18.5%) showed a predominance of men (41, 70.7%) and women (18, 31.0%), which is related to the physical strain men experience during work.

A physical examination revealed that among 314 patients, 121 (38.5%) had somatic pathology, manifested as arterial hypertension (98, 31.2%) and ischemic heart disease (23, 7.3%). Diabetes mellitus was observed in 35 (11.1%) cases, liver disease in 8 (2.5%) patients, and renal failure in 3 (0.9%).

Of the 314 patients admitted to the hospital, 117 (37.3%) were diagnosed with neoplasms, including 97 (31%) with brain tumors and 20 (6.4%) with spinal cord tumors. Almost half (58 (49.6%)) were in moderate condition upon admission, slightly more than a third (43 (36.7%) were in severe condition, and only 13 (11.1%) were in satisfactory condition. Two (1.7%) and one (0.85%) patient were admitted in extremely severe and moribund conditions, respectively.

A study of 117 patients using the Glasgow Coma Scale revealed that 68 patients, or 58.1%, retained clear consciousness. Moderate stupor occurred in 16 patients (13.7%), and profound stupor in 9 patients (7.6%). The distribution of patients in severe condition was as follows: stupor - 9 (7.6%), coma I - 7 (5.9%), and coma II - 5 (4.2%). The remaining 2 patients (1.7%) had terminal coma – grade III coma.

A clinical and neurological examination of patients in the first group revealed the following changes: epileptic seizures were recorded in 11 patients (9.4%); primary generalized epileptic seizures were observed in 24 patients (20.5%), and convulsive readiness was recorded in 16 patients (13.7%). Headache was a persistent symptom and was observed in 74 (63.2%) patients. Headaches were often accompanied by vomiting and nausea during hospitalization, occurring in 44 (37.6%) and 55 (47.0%) cases, respectively. 37 (31.6%) patients also experienced repeated vomiting.

Nystagmus is one of the most common symptoms of brain tumors, observed in 37 (31.6%) of the 117 patients examined. Based on data analysis of 117 observations, nuchal rigidity was observed in 57 (48.7%) patients. Movement disorders, such as hemiparesis, were recorded in 26 (22.2%) of the 117 patients in the study group.

In our study, all 82 patients in the second group underwent surgical treatment. The indications for surgical treatment were: cauda equina syndrome with progressive pelvic dysfunction and ridicule-ischemic manifestations; radicular pain or low back pain lasting at least 4 weeks; intervertebral disc herniation in any location, but only at one level, confirmed by axial MRI; failure to respond to conservative treatment.

There were only 122 cases of neurological symptoms in the second group; several symptoms could coexist in the same patient. The most common complaint presented by patients in the second group was lumbar spine pain (43 cases), the second most common complaint was gait disturbance and sensory disturbance (26 cases each), and the third most common complaint was forced body position due to pain (21 cases). Neurological symptoms: low back pain - 27 (32.9%); Low back pain radiating to one leg 9 (9.7%); Low back pain radiating to both legs 7 (8.5%); Isolated pain in the leg/legs 7 (8.5%); Gait disturbance 26 (31.7%); Forced body position due to pain syndrome 21 (25.6%); Sensory disturbance 25 (30.5%) cases of observation.

This demonstrates the effectiveness of treatment methods for patients with lumbar disc herniations using a differentiated approach.

The third group included 57 patients (18.1%) requiring rehabilitation care, of whom 46 (14.6%) had spinal cord injury and 11 (3.5%) had traumatic brain injury.

In our observations, two patients (18.2%) with movement disorders such as hemiparesis following traumatic brain injury received comprehensive rehabilitation treatment.

Twenty patients (4.3%) with degenerative diseases and lumbar disc herniations, including sensory impairment, also received comprehensive rehabilitation treatment. The patient examination revealed various types of impairments and neurological symptoms that persisted for a long time. It should be noted that the forced body position due to pain syndrome in 21 (25.6%) patients quickly regressed after rehabilitation treatment.

The fourth group included functional and other neurosurgical diseases (58 cases, 18.5%), including trigeminal neuralgia (16 cases, 5.1%), vascular diseases of the head and spinal cord (14 cases, 4.4%), and congenital anomalies (Arnold-Chiari-1 malformation, 25 cases, brain cysts, 2 cases, and spinal scoliosis, 1 case, out of a total of 314 observations). In our study of 16 patients, an analysis of the provoking factors revealed that almost all patients experienced the following: chewing and talking were provoking factors in over 93% of cases, followed by touch (8%), and cold, toothbrushing, washing, shaving, and opening the mouth (less than 5%).

We also checked for symptoms of hypertonicity of the masticatory muscles, autonomic dysfunction, and hypoesthesia in the innervation zones of individual branches or the entire side of the face. We also confirmed that trigeminal neuralgia is characterized by short attacks (2-15 minutes) that can recur frequently (up to 30 times per day). A study of sensory disturbances in the innervation zone of the trigeminal nerve branches yielded the following results.

In our study of 58 patients with functional and other neurosurgical diseases, 25 (43.1%) had Arnold-Chiari anomaly-1 (ACh-1). Headache was the most common and early symptom, reported in 18-73% of patients. The most typical type is a "cough" headache. As the name suggests, a characteristic symptom is increased pain in the cervical-occipital region during coughing and sneezing, observed in 12-48% of patients. A similar increase in headache during the Waltz maneuver was observed in 75% of patients.

Sensory disturbances are noted as the first manifestation of the disease in up to 60% of all patients, most often affecting the arms. Overall, sensory disturbances were found in 19-76% of cases. Patients with concomitant syringomyelia typically present with symptoms of damage to the anterior horns of the spinal cord. The third most common manifestation of ACh-1 is spinal pyramidal syndrome, characterized by tetra-, para-, or hemiparesis. Progressive weakness in the upper extremities is the initial manifestation of the disease in 44% of patients, and in the lower extremities in 39%. Bilateral lesions are characterized by asymmetry of paretic disturbances. Overall, motor impairments are detected in 20-80% of patients.

Pyramidal symptoms in our patients were combined with cerebellar and brainstem symptoms. In 13-52% of patients, the disease manifests with cerebellar symptoms, including static and gait disturbances, dysmetria, dyssynergia, and intention tremor.

Cranial nerve dysfunction was observed in 16-64% of patients. In 10-25% of these patients, the disease begins with unilateral or bilateral damage to the caudal nerves (dysphonia, dysphagia, tongue muscle atrophy, etc.).

Nocturnal breathing disorders are observed in 50-70% of patients, manifesting as hypopnea, central or obstructive apnea, and even acute respiratory failure.

Quality of life assessment of 314 patients was assessed using the Euro Qol-5D Quality of Life Questionnaire, and a visual analogue scale was used to assess pain.

Across all study groups, the most significant deterioration in the Euro Qol-5D parameters was pain/discomfort and anxiety/depression. This is due to the fact that pain is the most powerful irritant affecting patients' emotional state and quality of life. Quality of life assessments were conducted in all groups before and after surgery.

Our analysis of the patient quality of life study results revealed that the data obtained in all four groups varied. The patient quality of life study revealed that the most significant impact is on the parameters of pain/discomfort and anxiety/depression, which is further exacerbated by the emotional state of the patients.

Pain, as a strong irritant, primarily affects the emotional state of patients, acting as a trigger for deterioration.

Experiencing pain can lead to extremely negative thoughts, which trigger fears of increased pain, damage, and consequences. This triggers a dominant focus in the brain, acting as a trigger for pain. Avoidance behavior is quickly reinforced, leading to increased fear, limited physical activity, and other physical and psychological consequences that contribute to disability and the spread of pain. All of these factors, in turn, contribute to a deterioration in patients' quality of life.

Our studies of the VAS scale after treatment for various neurosurgical conditions yielded the following results: after surgical treatment, pain regressed to complete disappearance in all four groups. Mild pain persisted in only two patients in the first group, one patient in the second group, and four patients in the third group, demonstrating the effectiveness of treatment methods with a differentiated approach.

In our observations, a pain assessment of all 314 patients revealed the following results: vigilance and monitoring of harmful factors, as well as the belief that these signals of disease progression can transform even mild pain into unbearable pain. This is a significant phenomenon that negatively impacts quality of life.

Thus, based on the analysis of the study data for all 314 patients, we can conclude that vigilance and monitoring of harmful factors, as well as the belief that these signals of disease progression can transform even mild pain into unbearable pain.

## 4. Conclusions

1. The neurosurgical service in Navoi Region is well organized, employing approximately 80% of high-tech neurosurgical treatment methods. The equipment available accounts for 60% of the total brain tumor incidence per 100,000 population, accounting for 4% of the total cancer incidence in the Republic of Uzbekistan.
2. A physical examination revealed that among 314 patients, 121 (38.5%) had somatic pathology, manifested as arterial hypertension in 98 (31.2%) patients and ischemic heart disease in 23 (7.3%) patients. Diabetes mellitus was noted in 35 (11.1%) cases, liver disease in 8 (2.5%) patients, and renal failure in 3 (0.9%) patients. The main contraindications for high-tech neurosurgical interventions are contraindications to general anesthesia and lack of equipment.
3. Of the total number of 314 patients, 117 (37.3%) were observed with neoplasms, including 97 (31%) with brain tumors and 20 (6.4%) with spinal cord tumors admitted to the hospital for treatment. Almost half, 58 (49.6%), were in moderate condition upon admission, slightly more than a third, 43 (36.7%), were in severe condition, and only 13 (11.1%) were in satisfactory condition. Two (1.7%) and one (0.85%) patient, respectively, were admitted in an extremely severe and agonal state, which significantly impacts the patients' quality of life.
4. A study of our sample of 117 patients using the Glasgow Coma Scale revealed that 68 (58.1%) patients retained clear consciousness. There were 16 patients (13.7%) in moderate stupor and 9 (7.6%) in profound stupor. The distribution of patients in severe condition was as follows: stupor - 9 (7.6%), coma I - 7 (5.9%), coma II - 5 (4.2%).

## REFERENCES

[1] Ashkhatsava T.I., Tatarinova M.Yu., Kogoniya L.M., et al. / Current issues in the clinical presentation of primary brain tumors // Medical Council. — 2019. — 19. — Pp. 181-188. doi: 10.21518/2079-701X-2019-19-181-188.

[2] Gabidullin A.F., Danilov V.I., Alekseev A.G. / Neurological deficit in patients after brain tumor removal using high-tech neurosurgical methods and optimization of treatment for this group of patients // Neurological Bulletin. 2015. Vol. 47, No. 2. P. 26-29.

[3] Evsina O.V. / Quality of life in medicine - an important indicator of the patient's health (literature review) // Electronic scientific journal "Personality in a changing world: health, adaptation, development": 2013. No. 1. - P. 119-133.

[4] Zharova E.N., Kiryanova V.V., Moguchaya O.V., Simonova I.A. / Experience in organizing the rehabilitation of neurosurgical patients in a specialized clinic // Physiotherapy, balneology and rehabilitation. 2015. Vol. 14, No. 3. P. 36-39.

[5] Kit O.I., Zakondyrin D.E., Grin' A.A., Rostorguev E.E., Yundin S.V. / Experience in treating spinal tumors complicated by compression of the spinal cord and its roots // Innovative medicine of Kuban. 2022. Vol. 7, No. 1. P. 5-11.

[6] Lobanovskaya O.N., Sidorovich R.R., Vasilevich E.N., Rodich A.V., Terekhov V.S., Rakot G.Ch. / Awake craniotomy for various neurosurgical pathologies: optimization of the method and our experience of use // Russian Neurosurgical Journal named after Professor A. L. Polenov. 2022. Vol. 14, No. S1. P. 181.

[7] Nikolaev E. L. / Assessment of health-related quality of life: are doctors healthier than teachers? // Bulletin of the Chuvash University. - 2014. - No. 2. - P. 310-315.

[8] Akshulakov S., Aldiyarova N., Ryskeldiyev N. et al. / Introduction of Questionnaires for Quality of Life of Patients with Malignant Tumors of the Central Nervous System into Neurosurgical Practice in the Republic of Kazakhstan // Asian Pac. J. Cancer Prev. 2016. Vol 17, № 2. P 873-876. DOI: 10.7314/apjcp.2016.17.2.873. PMID: 26925695.

[9] Alankar K., Vishwanath S., Joshua D.B., Alfredo S. A., Pablo A.V. / Hyperspectral imaging in neurosurgery: a review of systems, computational methods, and clinical applications // Journal of Biomedical Optics February 2025 • Vol. 30(2) 023511.

[10] Eesha Y., Nimirta S., Dua A. Z., Shiza A., Fatima S., Shahzad A. Kh., Bipin Ch., Saad J. / Intersection of Care: Navigating Patient-Hospital Relationships in Neurosurgery // World neurosurgery, https://doi.org/10.1016/j.wneu.2024.10.077.

[11] Jukka H., Timo K. / Optimizing neurosurgery clinic operations: a comparative study of interventions in Finland's public healthcare system // International Journal for Quality in Health Care, 2024, 36(4), mzae106 DOI: https://doi.org/10.1093/intqhc/mzae106 Advance Access Publication Date: 19 November 2024.

[12] Moritz U., Rene H., Lucas R., Katharina B., Arwin R., Andreas K., Christoph J.G. / Christoph Schwartz Surgical treatment of meningiomas improves neurocognitive functioning and quality of life – a prospective single-center study // Acta Neurochirurgical (2024) 166: 402. https://doi.org/10.1007/s00701-024-06295-5.