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Sensations and satisfaction of patients undergoing awake craniotomy

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ABSTRACT

Modern anesthetic methods can provide successful brain mapping in almost any patient. Despite integration of awake craniotomy in the world's leading neurosurgical clinics, some anesthesiologists and neurosurgeons still believe that awake craniotomy for resection of brain tumors is difficult for patients.

Objective. To analyze patient satisfaction and subjective feelings after awake craniotomy.

Material and methods. There were 30 participants after awake craniotomy. Mean age of patients was 43.2 years. Original checklist for assessment of patient satisfaction after awake craniotomy was developed by Sinbukhova E.V. and Lubnin A.Yu. Pain was assessed using visual analogue scale. We estimated anxiety using Hanin-Spielberger and HADS scales.

Results. About 86% of patients had high satisfaction scores for "memories before surgery", 56.7% of patient — for "memories during surgery", 33.7% of patients — for "memories after surgery".

Conclusion. When evaluating awake craniotomy according to 10-point scale (10 points — very comfortable anesthesia), only one patient chose 9 points, and all other ones chose the highest score.

Keywords: *awake craniotomy, sensations of patients.*

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Introduction

In 1886, Horsley V. first performed awake craniotomy (AC) using cortical electrical stimulation[1]. Thus, these interventions have a considerable history, but this method was used sparingly for many years, primarily in surgery for drug-resistant epilepsy.

Today, neurosurgeons and anesthesiologists often use AC for hemispheric gliomas, particularly those in functionally important (speech and motor) brain areas[2] [1—3]. Literature data indicate that AC is associated with higher extent of resection and lower incidence of new postoperative neurological deficit[3] [3]. A meta-analysis of 10 well-known studies suggests that AC with brain mapping is the "gold standard" for resection of tumor or lesion in functionally important brain areas. This method minimizes neurological deficits while preserving important functions, primarily speech [4].

Comparison of neuropsychological testing in patients with and without mapping revealed better cognitive functions and speech in mapping-assisted surgeries. AC with mapping is a safe, effective and feasible method providing better results with minimal side effects [5, 6].

Modern anesthetic techniques can ensure successful brain mapping in virtually any patient. However, clinical benefits of AC and intraoperative brain mapping largely depend on the quality of intraoperative arousal and intraoperative verbal interaction with neuropsychologist [3].

[1]Özlü O. Anaesthesiologist's approach to awake craniotomy. *Turkish Journal of Anaesthesiology and Reanimation*. 2018;46(4):250-256. https://doi.org/10.5152/TJAR.2018.56255

[2]Bonhomme V, Franssen C, Hans P. Awake craniotomy. *European Journal of Anesthesiology*. 2009;26(11):906-912. https://doi.org/10.1097/EJA.0b0013e32833000c5
Bilotta F, Rosa G. 'Anesthesia' for awake neurosurgery. *Current Opinion in Anaesthesiology*. 2009;22(5):560-565. https://doi.org/10.1097/ACO.0b013e3283302339

[3]De Witt Hamer PC, Robles SG, Zwinderman AH, Duffau H, Berger MS. Impact of intraoperative stimulation brain mapping on glioma surgery outcome: a meta-analysis. *Journal of Clinical Oncology*. 2012;30(20):2559-2565. https://doi.org/10.1200/JCO.2011.38.4818

Selecting patients for AC is an important process requiring a comprehensive psychological, cognitive and functional assessment. Psychological factors such as anxiety and fear of pain can significantly impact intraoperative compliance and potentially lead to failure [4]. In general, planning AC, like any surgical procedure, is associated with significant anxiety for patients.

Despite introduction of AC in many neurosurgical clinics worldwide, some anesthesiologists and neurosurgeons still believe that awakening during brain tumor resection is difficult for patients. However, studies demonstrate that patients tolerate AC[4] well after adequate psychological preparation and support. Therefore, AC should be preceded by psychological assessment, including neuropsychologist responsible for intraoperative testing[5] [3]. Preoperative preparation and patient informing are essential in reducing patient anxiety during AC [8]. We previously presented various aspects of this complex issue [1].

What is meant by patient "satisfaction"? Patient satisfaction with medical care is a complex indicator characterizing correspondence of timing and quality of medical care to the patients' expectations, their perceptions of appropriate accessibility and quality of care, as well as overall function of hospital[6]. Measurement of patient satisfaction has become especially significant in recent years. Patient satisfaction is becoming an indicator of quality and effectiveness of healthcare system as a whole. In fact, patients evaluate not so much treatment outcomes, as realization of their expectations in medical care. This assessment includes, among other things, responsiveness, empathy, courtesy of medical staff and professionalism [7]. Patient satisfaction assessments enable creation of effective tool for analysis of each healthcare employee [7, 8]. Thus, one of the key areas of healthcare development today is improvement of patient satisfaction with medical care. As a result, all stakeholders benefit: patients trust medical organizations, the number of complaints decreases and physicians are more satisfied with work and less prone to professional burnout.

Remembering medical information about upcoming treatment influences satisfaction and correspondence between expectations and reality. For example, patients remember no more than 17—60% of information after consultation. Moreover, 40—80% of information provided by doctors is immediately forgotten, and almost half of what is "remembered" is fictitious or misinterpreted. Correlation between anxiety, depression and information retained by patients is negative: as anxiety and depression increase, amount of medical information retained decreases [9].

The purpose of this study was to analyze patient satisfaction with medical care and subjective experiences after AC.

Material and methods

The study enrolled 30 neurosurgical patients with fronto-parieto-temporal gliomas in speech-dominant hemisphere.

Inclusion criteria were: age ⩾16 years, AC with available verbal contact.

Exclusion criteria: MoCA score< 26.

We surveyed patient after 1—2 postoperative days. Mean age was 43.2 years (range 19—65, standard deviation 13.7). There were 12 men and 18 women. Sixteen (53.3%) patients had previous general anesthesia, 4 (13.3%) — awake surgery.

We assessed subjective feelings and satisfaction of patients in 1—2 days after surgery using a modified questionnaire for satisfaction after AC (Appendix). Preoperative scores ranged from 5 to 20 points (20 points — the highest satisfaction). Intraoperative scores ranged from 6 to 24 points (24 points — the highest satisfaction). Postoperative scores ranged from 18 to 72 points (18 points — the highest satisfaction, 72 points — the lowest satisfaction).

By this time, all patients were in the department; their clinical status was stable. There were no neurological deficits or speech impairments. The State-Trait Anxiety Inventory (STAI) and the Hospital Anxiety and Depression Scale (HADS) were used. We analyzed pain using visual analogue scale.

R-Studio (Version 1.0.153) was used for statistical analysis.

Results

Mean trait anxiety (TA) was 35.8 points (mean 42.8, standard deviation (σ) 7.9), state anxiety (SA) — 37 points (mean 41.5, σ 9.5) (moderate state and trait anxiety). Mean HADS score of depression was 1.5 **(Fig. 1)**.

In our study, 30% and 37% of patients demonstrated high SA and TA, while 70% and 63% demonstrated moderate SA and TA, respectively. There were no signs of depression in 63% of patients. Subclinical depression was observed in 13% of patients, clinically significant depression — in 23%.

Satisfaction with anesthesia was as follows: preoperative memory block (interview with anesthesiologist and neurosurgeon, unanswered questions) — 17 points (mean 16.9, σ=1.88), minimum and maximum values - 12 and 20 points, respectively. In "preoperative memory" block, mean score was 20 (mean 19.18, σ=3.28, minimum and maxi-

4Klimek M, van der Horst PH, Hoeks SE, Stolker RJ. Quality and Quantity of Memories in Patients Who Undergo Awake Brain Tumor Resection. *World Neurosurgery.* 2018;109:e258-e264. https://doi.org/10.1016/j.wneu.2017.09.158

5Özlü O. Anaesthesiologist's approach to awake craniotomy. *Turkish Journal of Anaesthesiology and Reanimation.* 2018;46(4):250-256. https://doi.org/10.5152/TJAR.2018.56255

6Central Research Institute for Organization and Informatization of Healthcare. *Standard of a healthcare organization management system aimed at increasing patient satisfaction.* M.; 2023. Accessed September 10, 2025. (In Russ.). https://mednet.ru/images/images/rabota-s-udovletvorennostju/buklet_STIMUL_20_10_2023.pdf

mum 15 and 24, respectively). Mean score in postoperative assessment block was 23 (mean 24, σ=5.59, with minimum and maximum 18 and 39 points, respectively) **(Fig. 2)**.

High satisfaction scores for preoperative memory were reported by 86% of patients. For intraoperative block, 56.7% and 26.7% of patients reported high and low scores, for postoperative block — 33.7% and 10%, respectively.

All patients answered the following question: "Rate awake surgery on a 10-point scale, where 10 — you were very comfortable during anesthesia". Only one patient chose 9 points; all others gave 10 scores.

Correlation analysis of TA, SA, depression and satisfaction, as well as correlation analysis of pain perception and TA, SA, depression is presented in **Table 1, 2**.

There were significant correlations between SA and TA after surgery, as well as with pain intraoperatively and upon examination. More severe anxiety was accompanied by more intense pain complaints and lower satisfaction with anesthesia. A similar pattern was observed for depression: higher depression was followed by more severe pain and lower satisfaction. Regression analysis of depression and satisfaction after surgery is presented in **Table 3**.

These values demonstrate a significant relationship between depression and postoperative "feelings and complaints" regarding satisfaction.

Impact of patient gender and age on satisfaction is presented in **Table 4**.

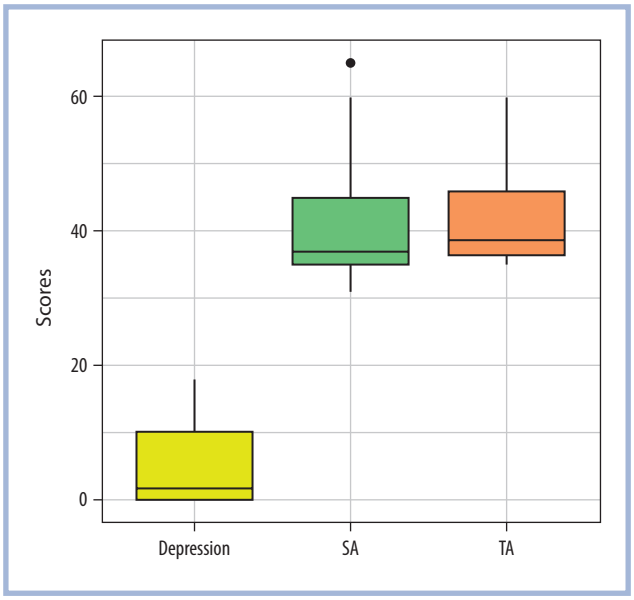

Fig. 1. **SA, TA and depression scores.**

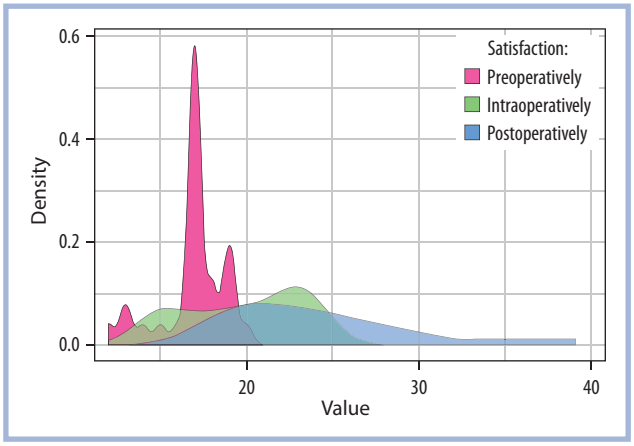

Fig. 2. **Satisfaction with anesthesia (preoperative memory, intraoperative memory block, postoperative assessment block).**

Table 1. **Correlation analysis of state anxiety, trait anxiety, depression and satisfaction**

Factor	Memories of preoperative period	Intraoperative	Postoperative
Depression	−0.56	−0.66	0.7
SA	−0.65	−0.58	0.59
TA	−0.56	−0.55	0.58

Table 2. **Correlation analysis of pain perception, state anxiety, trait anxiety and depression**

Factor	Intraoperative pain	Pain upon examination
Depression	−0.74	0.89
SA	−0.54	0.9
TA	−0.6	0.87

Table 3. **Regression analysis of postoperative satisfaction depending on severity of depression**

Satisfaction	Estimate	Standard error	*t*-value	*p*-value
(Intercept)	−16.1070	4.2733	−3.769	0.000777 ***
	0.8963	0.1711	5.239	1.44e−05 ***

Table 4. **Regression analysis of satisfaction depending on age and gender**

Satisfaction	Estimate	Standard error	*t*-value	*p*-value
Age				
(Intercept)	30.1	39.07	0.77	0.45
Memories of preoperative period	−0.31	1.53	−0.20	0.84
Intraoperative	0.59	0.97	0.6	0.55
Postoperative	0.28	0.59	0.47	0.64
Gender				
(Intercept)	0.64	1.35	0.48	0.64
Memories of preoperative period	0.08	0.05	1.56	0.13
Intraoperative	−0.01	0.03	−0.32	0.75
Postoperative	−0.009	0.02	−0.45	0.66

Table 5. **Regression analysis of satisfaction depending on previous anesthesia**

Satisfaction	Estimate	Standard error	*t*-value	*p*-value
Previous anesthesia				
(Intercept)	2.87	1.42	2.02	0.05
Memories of preoperative period	−0.05	0.06	−0.85	0.40
Intraoperative	−0.02	0.04	−0.67	0.51
Postoperative	−0.01	0.02	−0.278	0.79
Previous anesthesia with awakening				
(Intercept)	1.89	0.96	1.98	0.06
Memories of preoperative period	−0.02	0.04	−0.5	0.62
Intraoperative	−0.001	0.02	−0.07	0.94
Postoperative	0.01	0.01	0.92	0.37

Thus, neither gender nor age influenced satisfaction with AC.

Regression analysis of satisfaction depending on previous anesthesia is presented in **Table 5**.

In our sample, previous general anesthesia did not influence satisfaction with AC.

Discussion

Patient perceptions and satisfaction with awake anesthesia were discussed in our recent review. We can conclude that awake anesthesia is well tolerated by patients, but there are some caveats [1]. This study clearly confirmed this thesis.

Other researchers reported few but mostly positive perioperative memories of patients, even about relatively long periods of tumor resection when they were fully conscious and cooperative. More than one-fifth of patients had no recollection about neuropsychological testing. This is consistent with results reported by Whittle I.R. et al. They found that 8—37% of patients do not recall intraoperative awakening. In another study, 93% of patients felt themselves sufficiently involved in decision-making regarding awake surgery, and they were provided with sufficient information during consultation [10]. In another study, patients were interviewed 1, 4 and 24 hours after surgery to determine their recollection of the procedure, severity of pain, if present, and satisfaction. The incidence of intraoperative complications did not differ depending on narcotic analgesic. Recall and satisfaction scores did not differ, and 93% of all patients were completely satisfied across all interviews [11].

In the study dated 2024, patient perceptions and satisfaction were measured in 3—5 days and 6 months after surgery. This study included analysis of anxiety and depression. Among 50 patients, 28 ones reported intraoperative pain (mean 4.1); 26 patients experienced pain after surgery (mean 2.7). Patient satisfaction with intraoperative communication was recorded with mean value 8.3. There was a significant negative correlation between perceived pain and satisfaction with intraoperative communication (p=0.023). Good intraoperative communication in awake patients was associated with positive perception of environment and correlated with pain reduction [8].

Today, AC is a safe and effective method allowing highly effective cortical tumor resection with low risk of postoperative neurological deficit [12—14]. Modern research shows that proper preoperative examination improves patient satisfaction. Nevertheless, some patients still experience some pain or fear during AC that can cause posttraumatic stress disorder or other symptoms [15]. In another study, 100% of patients rated their overall impressions of AC as good or excellent; 80% were willing to undergo the second AC if necessary [16].

Importantly, clinical practices mitigating intraoperative stress in patients undergoing AC are also being studied. For example, compassion, communication and perceived control on the part of the patient were critical in mitigating intraoperative stress [17]. Interventions and strategies reducing patient stress are quite important and can increase the likelihood of optimal brain mapping and favorable outcomes after AC [17].

Conclusion

About 86% of patients reported high satisfaction scores with treatment according to preoperative memories, 56.7% — intraoperative memories, 33.7% — postoperative assessment. All patients answered the following question: “Rate awake surgery on a 10-point scale, where 10 — you were very comfortable during anesthesia”. Only one patient chose 9 points; all others gave 10 scores.

Higher depression and anxiety upon examination are associated with lower satisfaction rates. To overcome discomfort and pain during AC, it is necessary to devote due attention and time to preoperative and intraoperative communication with the patient. It is also necessary to consider psychological state of patients and, if anxiety or depression is detected, employ psychological correction. This will contribute to higher patient satisfaction.

Author contribution:
Concept and design of the study — Lubnin A.Yu.
Questionnaire — Lubnin A.Yu., Sinbukhova E.V.
Collection and analysis of data, statistical analysis — Sinbukhova E.V.
Writing — Lubnin A.Yu., Sinbukhova E.V.
Editing — Lubnin A.Yu., Sinbukhova E.V., Kulikov A.S.

No conflict of interests to declare.

REFERENCES

1. Lubnin AYu, Sinbukhova EV, Kulikov AS, Kobyakov GL. Sensations of patients and their satisfaction during awake craniotomy. *Burdenko's Journal of Neurosurgery*. 2020;84(5):89-101. (In Russ., In Engl.) https://doi.org/10.17116/neiro20208405189
2. Kobiakov GL, Lubnin AYu, Kulikov AS, Gavrilov AG, Goriaĭnov SA, Poddubskiy AA, Lodygina KS. Awake craniotomy. *Burdenko's Journal of Neurosurgery*. 2016;80(1):107-116. (In Russ., In Engl.) https://doi.org/10.17116/neiro2016801107-116
3. Kulikov A, Lubnin A. Anesthesia for awake craniotomy. *Current Opinion in Anaesthesiology*. 2018;31(5):506-510. https://doi.org/10.1097/ACO.0000000000000625
4. McBenedict B, Hauwanga WN, Fong YB, Pogodina A, Obinna EE, Pradhan S, Kazmi SS, Netto JGM, Lima Pessôa B. Awake Craniotomy in Neurosurgery: A Bibliometric Analysis of the Top 100 Most-Cited Articles and Review of Technological Advancements. *Cureus*. 2024;16(12):e76290. https://doi.org/10.7759/cureus.76290
5. Tariq R, Aziz HF, Paracha S, Ahmed N, Baqai MWS, Bakhshi SK, McAtee A, Ainger TJ, Mirza FA, Enam SA. Intraoperative mapping and preservation of executive functions in awake craniotomy: a systematic review. *Neurological Sciences*. 2024;45(8):3723-3735. https://doi.org/10.1007/s10072-024-07475-y
6. Vadhavekar NH, Sabzvari T, Laguardia S, Sheik T, Prakash V, Gupta A, Umesh ID, Singla A, Koradia I, Ramirez Patiño BB, Siddiqui HF. Advancements in Imaging and Neurosurgical Techniques for Brain Tumor Resection: A Comprehensive Review. *Cureus*. 2024;16(10):e72745. https://doi.org/10.7759/cureus.72745
7. Tsvetkova AB, Nikishkin VV. Assessment of Patient Satisfaction with the Services of Medical Centers. *Practical Marketing*. 2021;11(297):19-27. (In Russ.). https://doi.org/10.24412/20713762021112971927
8. Sauvigny J, Mader MM, Freundlieb N, Gempt J, Westphal M, Zöllner C, Mende A, Czorlich P. Patient perception and satisfaction in awake burr hole trepanation under local anesthesia for evacuation of chronic subdural hematoma. *Clinical Neurology and Neurosurgery*. 2024;236:108085. https://doi.org/10.1016/j.clineuro.2023.108085
9. Sinbukhova EV, Shimanskiy VN, Tanyashin SV, Shevchenko KV, Poshataev VK, Abdurakhimov FD, Lubnin AYu. Remembering what the doctor said: how much of medical information will the patient remember? *Russian journal of neurosurgery*. 2021;23(4):50-60. (In Russ.). https://doi.org/10.17650/1683-3295-2021-23-4-50-60
10. Wahab SS, Grundy PL, Weidmann C. Patient experience and satisfaction with awake craniotomy for brain tumours. *British Journal of Neurosurgery*. 2011;25(5):606-613. https://doi.org/10.3109/02688697.2011.568642
11. Manninen PH, Balki M, Lukitto K, Bernstein M. Patient satisfaction with awake craniotomy for tumor surgery: a comparison of remifentanil and fentanyl in conjunction with propofol. *Anesthesia & Analgesia*. 2006;102(1):237-242. https://doi.org/10.1213/01.ANE.0000181287.86811.5C
12. Patchana T, Lopez JA, Majeed G, Ho A, Alarcon T, Plantak N, Vu P, Siddiqi J. The Awake Craniotomy: A Patient's Experience and A Literature Review. *Cureus*. 2022;14(6):e26441. https://doi.org/10.7759/cureus.26441
13. Zele T, Velnar T, Koritnik B, Bosnjak R, Markovic-Bozic J. Awake craniotomy for operative treatment of brain gliomas — experience from University Medical Centre Ljubljana. *Radiology and Oncology*. 2023;57(2):191-200. https://doi.org/10.2478/raon-2022-0052
14. Leon-Rojas JE, Ekert JO, Kirkman MA, Sewell D, Bisdas S, Samandouras G. Experience with awake throughout craniotomy in tumour surgery: technique and outcomes of a prospective, consecutive case series with patient perception data. *Acta Neurochirurgica*. 2020;162(12):3055-3065. https://doi.org/10.1007/s00701-020-04561-w
15. Potters JW, Klimek M. Awake craniotomy: improving the patient's experience. *Current Opinion in Anesthesiology*. 2015;28(5):511-516. https://doi.org/10.1097/ACO.0000000000000231
16. Tan CL, Jain S, Chan HM, Loh NW, Teo K. Awake craniotomy for brain tumor resection: Patient experience and acceptance in an Asian population. *Asia-Pacific Journal of Clinical Oncology*. 2023;19(1):172-178. https://doi.org/10.1111/ajco.13785
17. Colgan DD, Eddy A, Aulet-Leon M, Green K, Peters B, Shangraw R, Theard MA, Han SJ, Raslan A, Oken B. Compassion, communication, and the perception of control: a mixed methods study to investigate patients' perspectives on clinical practices for alleviating distress and promoting empowerment during awake craniotomies. *British Journal of Neurosurgery*. 2024;38(4):911-922. https://doi.org/10.1080/02688697.2021.2005773

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COMMENT

Surgical trauma in neurosurgery is one of the most controversial areas of anesthesiology. On the one hand, brain is not the source of shock crises, on the other hand, anesthesia is insidious in distorting signals of damage to functionally active areas, especially during tumor resection. The authors have spent many years in searching for golden ratio: sensitive monitoring, freedom of actions for neurosurgeon and patient satisfaction. The key is simple. Intraoperative awakening and performance of specific tasks allowing assessment of appropriate actions that may be lost due to interventions is the most informative monitoring. This is now clear. During voluntary activity, the patient "uses" functionally "silent" cortical areas and pathways that are not activated by standard cortical stimulation. This phenomenon is called "remodeling within neuroplasticity". However, the manuscript focuses on another aspect of golden ratio not studied before (postoperative emotional-cognitive "trace"). Survey revealed clear advantages not only of awake craniotomy itself, but also the entire perioperative emotional preparation of the patient. There is no point in recounting this, as it's all described in the article. The authors found strong correlations between state and trait anxiety, depression and pain perception. I believe this reflects the fundamental law of neurotransmitter competition. Depression implies serotonin deficiency, and serotonin further decreases under pain-related excessive glutamate release. Thus, higher preoperative anxiety is followed by more severe pain or higher need for analgesics. Conversely, higher perioperative pain is followed by more severe postoperative depression and worse satisfaction. From this perspective, we can assume that low depression after awake craniotomy reflects optimal analgesia. As they say in such cases, this is exactly what was required. I congratulate the authors on another breakthrough in improving satisfaction not only for patients but also for neurosurgeons in achieving favorable postoperative results.

Belkin A.A. (Ekaterinburg)

Appendix

Revised patient satisfaction questionnaire for awake craniotomy

The questionnaire contains 35 questions. Patients rate outcomes on a 4-point scale (from “no” (4 points) to “absolutely true” (1 point)). Patients provide overall assessment of awake surgery on a 10-point scale (10 — high comfort during anesthesia).

Individual registration card

1. Were you conscious and do you remember everything before this surgery?
   ☐ yes
   ☐ no

2. Gender:
   ☐ male
   ☐ female

3. Age, years: _____

4. Have you had previous anesthesia?
   ☐ yes
   ☐ no

5. Have you had previous anesthesia with awakening?
   ☐ yes
   ☐ no

Please choose the appropriate answer:

Before surgery	No	I guess so	Right	Absolutely right
6. I was very worried before surgery.	4	3	2	1
7. I believe that anesthesiologist took enough time before surgery the to explain me how anesthesia with awakening would be administered.	1	2	3	4
8. I believe that surgeon took enough time before surgery the to explain features of awake surgery	1	2	3	4
9.I was sufficiently involved in decision-making with surgeon that awake surgery was best for me	1	2	3	4
10. Was there anything I wanted to know more about before surgery?	4	3	2	1
During surgery	**No**	**I guess so**	**Right**	**Absolutely right**
11. In the operating theater, anesthesiologist informed me about what was happening to me before induction of anesthesia.	1	2	3	4
12. I felt comfortable	1	2	3	4
13. I felt safe	1	2	3	4
14. I felt discomfort.	4	3	2	1
15. I felt fear	4	3	2	1
16. I felt pain	4	3	2	1
After surgery	**No**	**I guess so**	**Right**	**Absolutely right**
17. Do you have any unpleasant memories of surgery?	1	2	3	4
18. Do you avoid reminders about surgery?	1	2	3	4
19. Did you notice impairment of memory after surgery?	1	2	3	4
20. Did you notice impairment of attention after surgery?	1	2	3	4
21. Did you have or do you have an increased need for safety after surgery?	1	2	3	4
22. I became more anxious/I am more nervous after surgery	1	2	3	4
23. I became more irritable after surgery	1	2	3	4
24. Time it takes me to fall asleep increased after surgery	1	2	3	4

25. I sleep worse after surgery	1	2	3	4
26. I get enough sleep at night after surgery	4	3	2	1
27. My dreams changed after surgery	1	2	3	4
28. Do you have nightmares after surgery?	1	2	3	4
29. My appetite changed after surgery	1	2	3	4
30. Did you lose weight after surgery?	1	2	3	4
31. Did you notice any changes in sensory perception of voices and images after surgery?	1	2	3	4
32. Do you experience fear more often than earlier after surgery?	1	2	3	4
33. Did/do you have any involuntary memories about surgery?	1	2	3	4
34. If you will need surgery in the future, would you want to have the same anesthesia again?	4	3	2	1
35. Rate this awake surgery on a 10-point scale (10 — you were very comfortable during anesthesia): _____				