Burdenko's Journal of Neurosurgery
2026, No. 1, pp. 57–64
https://doi.org/10.17116/neiro20269001157

The FOUR scale in assessing patients with acute cerebral insufficiency

© O.Z. ARSLANOV[1], A.A. BELKIN[1, 2], A.V. KULIKOV[1], N.S. NAGAEV[2]

[1]Ural State Medical University, Ekaterinburg, Russia;
[2]Clinical Institute of the Brain, Berezovsky, Russia

ABSTRACT

Treatment and rehabilitation of patients with acute cerebral insufficiency necessitate critical objectives (assessment of brain damage severity and prediction of potential outcomes). Despite the role of this stage, current consciousness assessment methods often lack sufficient accuracy and objectivity. A promising approach is the Full Outline of UnResponsiveness scale (FOUR) providing objective patient evaluation compared to traditional Glasgow Coma scale.

Objective. To evaluate clinical significance of the FOUR scale for patients with cerebral insufficiency.

Material and methods. A prospective single-center study included 200 patients with acute cerebral insufficiency. Analysis employed ROC curves, logistic regression and correlation methods.

Results. The FOUR scale demonstrated high prognostic accuracy in comatose patients (AUC=0.944 vs. 0.742 for GCS, $p< 0.001$). Strong correlations were found between FOUR scores and GOS grades (rs=0.7546, $p<0.0001$), as well as prediction of mortality (OR=3.4, 95% CI 2.1—5.6). For patients with chronic consciousness disorders, the FOUR scale showed benefits (AUC=0.936 vs. 0.745 for GCS).

Conclusion. The FOUR scale represents an optimal monitoring tool for patients with cerebral insufficiency.

Keywords: *coma, chronic disorders of consciousness, FOUR, GCS, acute cerebral insufficiency.*

INFORMATION ABOUT THE AUTHORS:
Arslanov O.Z. — https://orcid.org/0009-0003-6251-9879
Belkin A.A. — https://orcid.org/0000-0002-0544-1492
Kulikov A.V. — https://orcid.org/0000-0002-7768-4514
Nagaev N.S. — https://orcid.org/0009-0007-0561-4879
Corresponding author: Arslanov O.Z. — e-mail: orasmanbeto@mail.ru

TO CITE THIS ARTICLE:
Arslanov OZ, Belkin AA, Kulikov AV, Nagaev NS. The FOUR scale in assessing patients with acute cerebral insufficiency. *Burdenko's Journal of Neurosergery*. 2026;90(1):57–64. (In Russ.).https://doi.org/10.17116/neiro20269001157

Abbreviations

APACHE II, III — Acute Physiology and Chronic Health Evaluation II, III
AUC — area under the curve
CRS-R — coma recovery scale-revised
FOUR — full outline of unresponsiveness
GCS — Glasgow coma scale
GOSE — Glasgow outcome scale extended
RASS — Richmond agitation-sedation scale
SAPS II — simplified acute physiology score
SOFA — sequential organ failure assessment
BMI — body mass index
ICU — intensive care unit
ACI — acute cerebral insufficiency
PICS index — post-intensive care syndrome index
TBI — traumatic brain injury
RRS — rehabilitation routing scale

Introduction

Treatment strategy for ACI requires accurate assessment of brain damage and prognosis of outcome. In clinical practice, qualitative (Konovalov's scale) and quantitative methods including GCS are used for assessment of consciousness [1]. Over the past 50 years, GCS established itself as the "gold standard" for assessing consciousness upon admission to ICU. This scale was integrated into some other integral scales, such as the Hunt Hess Scale, APACHE II, APACHE III, SAPS II, SOFA, etc.

Despite simplicity and widespread use, GCS has significant limitations. The main drawback is no assessment of brainstem reflexes and complex motor responses that reduces its value in infratentorial injuries and chronic disturbance of consciousness. Difficult speech assessment in intubated patients and those with aphasia distorts the overall score. GCS has no sufficient significance for predicting outcomes in acute cerebral insufficiency even when used in ICU together with APACHE scale.

The CRS-R [2] is the "gold standard" for analysis of signs and severity of chronic disturbance of consciousness. This scale has high diagnostic value, but ineffective in emergency settings due to prolonged time necessary for measurement (20—40 minutes).

To overcome the limitations of GCS, Wijdicks F.M. et al [3] (Mayo Clinic) developed the FOUR scale. Its validation in prospective studies demonstrated high reproducibility among healthcare workers, superior sensitivity and specificity to GCS for acute cerebral insufficiency and 20% reduction of in-hospital mortality with each higher score.

Although the FOUR scale is positioned as an improved alternative to the GCS scale with higher prognostic value in intensive care units [4] and better significance [5], it is still not widespread in clinical practice. One of the key reasons is persistent lack of knowledge about this instrument among healthcare workers [6].

The purpose of the study was to evaluate clinical significance of the FOUR scale for patients with cerebral insufficiency.

We analyzed the effectiveness of the FOUR scale for clinical assessment of patients and prediction of acute cerebral insufficiency outcomes in intensive care units. Additionally, we assessed this scale in patients with prolonged impairment of consciousness as an alternative to the CRS-R in ICUs.

Material and methods

The study was conducted at the ICU of the Ural State Medical University. Patients were prospectively recruited at the ICU of the Surgut Clinical Traumatology Hospital for patients with chronic disturbance of consciousness and department of medical rehabilitation for patients with CNS lesions. The study was approved by the local ethics committee (protocol No. 011/0807 dated August 7, 2023, FOURACI NCT06043167 ClinicalTrials.gov).

The study included 200 ICU patients over 18 years old with ACI. Exclusion criteria: signs of severe multiple organ damage accompanied by uncompensated acute respiratory and cardiovascular failure or significant changes in clinical status between examinations. Secondary cohort (n=33) included patients with chronic impairment of consciousness (>4 weeks after brain injury).

A multidisciplinary rehabilitation team performed daily monitoring of neurological status and recorded all changes in database. Prognostic assessments were performed upon discharge from ICU, admission to rehabilitation unit or for patients with chronic impairment of consciousness. All survivors underwent follow-up examination after 90 days **(Table 1)**. The GOSE score, proposed in 1998, was used to assess treatment outcomes after 90 days.

Multivariable logistic regression was used to quantitatively assess the association between scores and mortality. Binary outcome (mortality/survival after 90 days) was dependent variable. Independent variables included minimum FOUR score (dichotomized: 0—4 vs. 5—16), minimum GCS score (dichotomized: 3 vs. 4—15), patient age (continuous variable) and APACHE II grade (continuous variable). Results are presented as adjusted odds ratios (OR) with 95% confidence intervals (CI).

Patient description

Throughout the study period, 719 patients admitted to ICU including 257 ones with ACI. After primary examination by anesthesiologist, 72 patients were excluded (3 due to death, 15 due to sedation, and 54 patients with signs of severe multiple organ damage). After redo examination within the first 24 hours, 15 patients were included in the study.

The final cohort consisted of 200 patients **(Table 2)**.

Patients were classified into the following categories depending on etiology of disease:

— 116 (58%) patients with stroke;
— 59 (29.5%) patients with mild-to-severe TBI;
— 25 (12.5%) patients with focal brain lesions.

Among all patients, 14 (7%) ones returned to previous life, 28 (14%) had a tendency towards good recovery. Mild dependence was noted in 51 (25.5%) patients, moderate dependence — in 36 (18%) patients, severe neurological deficit — in 24 (12%), neuromuscular failure — in 1 (0.5%), vegetative state — in 7 (3%), death — in 39 (19.5%) patients.

Statistical analysis

Statistical analysis was performed using Microsoft Excel 2016 and IBM SPSS Statistics 27.0. We analyzed distribution normality using the Kolmogorov-Smirnov test. Nonparametric methods were used for abnormal distributions. Data are presented as mean±standard deviation ($M \pm SD$). Correlation analysis was performed using Spearman's test with 95% CIs. Logistic regression and ROC analysis in MedCalc and IBM SPSS Statistics 27.0 were used to predict the outcome. We calculated OR (exp(β)) with 95% CI (Wald method). Statistical significance was assessed using the likelihood ratio test at $p < 0.01$.

Results

The study included 915 records (4.93±0.32 per a patient).

Analysis revealed significant correlations. FOUR and GCS scores inversely correlated with SOFA, APACHE II and RRS scores. This indicated the relationship between impaired consciousness and progression of multiple organ dysfunction. There was concomitant direct correlation between these scores and Rivermead mobility index that indicated parallel recovery of consciousness and motor function. However, no correlation was found with PICS index **(Table 3)**. These data highlight the role of comprehensive assessment of neurological status and somatic functions in predicting outcomes following acute cerebral insufficiency.

Table 1. **Procedure schedule**

Examination	Visit Screening				
Eligibility with inclusion/exclusion criteria	Upon admission	Day 1	Upon discharge from ICU	Admission to ICU/rehabilitation department	Day 90
Anamnesis	×			×	
Physical examination	×	×	×	×	×
BMI measurement	×	×	×	×	×
Assessment of consciousness according to the Konovalov's classification	×	×	×	×	×
FOUR scale	×	×	×	×	×
GCS	×	×	×	×	×
CRS-R	×	×	×	×	×
Comorbidity index	×				
SOFA	×	×	×	×	×
APACHE II	×	×	×	×	×
BPS/VAS	×	×	×	×	×
Rivermead mobility index	×	×	×	×	×
Hodkinson mental test score	×	×	×	×	×
PICS index			×	×	×
GOSE			×		×
Barthel scale	×	×	×	×	×
RRS	×	×	×	×	×

Note. BPS/VAS — basic pain scale/visual analogue scale.

Table 2. **Patient characteristics**

Variable	Value, n=200
Age, years	57.74±14.67
Gender, n (%)	
male	137 (68.5)
female	63 (31.5)
BMI, kg/m^2	27.19±5.71
Comorbidity index	5.62±3.88
RASS	−1.56±0.78
SOFA	3.62±3.81
APACHE II	13.78±10.48
Rivermead mobility index	2.02±2.17
Hodkinson mental test score	6.69±3.21
PICS index	1.99±1.83
Barthel scale	42.85±40.42
RRS	4.14±1.12

Correlation of FOUR and GCS scales with GOSE scale

There was a moderate positive correlation of GCS and FOUR scores with GOSE score. At baseline examination: GCS — 0.4728, FOUR — 0.4145 (p< 0.0001); at follow-up examination: GCS — 0.5700, FOUR — 0.5520 (p< 0.0001). We found a strong correlation at the final stage (GCS — 0.8572, FOUR — 0.7546, p< 0.0001). Sensitivity in the entire sample was as follows: GCS — 0.6333, FOUR — 0.5605 (p< 0.0001). FOUR score demonstrated higher correlation with GOSE score in patients with coma (0.4143 versus 0.2555 for GCS, p< 0.001). Thus, FOUR scale is not inferior to GCS scale in prognostic value for general population and superior in severe forms of ACI including brain death.

Correlation of FOUR and GCS items with GOSE scale

Table 4 presents the data from the scales used to determine the correlations between scale items.

In comatose patients, the FOUR scale demonstrated significant correlation with outcome (rs=0.4475, p< 0.001) (most pronounced in assessment of brainstem reflexes). There was moderate correlation for dislocation syndrome (B) (0.4094, p< 0.001) and respiratory center function (R) (0.4475, p< 0.001) that confirmed the role of brainstem assessment for prognosis in severe cerebral insufficiency. In non-comatose patients, GCS scale correlated moderately with outcomes (0.4504, p< 0.001), while FOUR scale correlated weakly (0.201, p< 0.001). Speech function (V) also demonstrated moderate correlation with favorable outcome (0.4568, p<0.001) that highlighted its prognostic value for assessment of functional recovery in favorable outcomes.

Table 3. **Correlation of scores**

Scale	SOFA	APACHE II	Rivermead mobility index	RRS	PICS index
GCS	−0.454, p<0.001	−0.442, p<0.001	0.431, p<0.001	−0.399, p<0.001	0.199, p<0.001
FOUR	−0.402, p<0.001	−0.403, p<0.001	0.367, p<0.001	−0.338, p<0.001	0.192, p<0.001

Table 4. **Correlation of FOUR and GCS items with GOSE scale**

Variable	GCS				FOUR				
	Eye Opening	Motor Response	Verbal Response	Sum	Eye response	Motor response	Brainstem reflexes	Respiration	Sum
Entire sample	0.4409	0.6339	0.5702	0.6333	0.5321	0.634	0.5436	0.4978	0.5605
No coma (moderate impairment of consciousness, clear consciousness)	0.0745	0.4217	0.4568	0.4504	0.2598	0.1091	0.4266	0.1685	0.201
Moderate—terminal coma	0.1141 p<0.1795	0.2424 p<0.005	—	0.2555	0.1264 p<0.1366	0.1091 p<0.1994	0.4094	0.4475	0.4475

Table 5. **ROC analysis of logistic prediction model for the FOUR and GCS scales across various assessments**

Scale	Examination				
	Baseline	Secondary	Final	Entire sample	Coma
GCS	0.762	0.826	0.967	0.861	0.742
FOUR	0.741	0.815	0.844	0.808	0.944
Difference (Δ)	0.02	0.011	0.11	0.053	−0.202

Analysis of the entire sample revealed that oculomotor response (E) on the FOUR scale had stronger correlation with outcome (rs=0.5321, p<0.001) than similar GCS score (rs=0.4409, p<0.001). Motor responses demonstrated comparable correlation with outcome for both scales (FOUR: 0.634; GCS: 0.6339). Brainstem reflexes showed significant correlation (rs=0.5436, p<0.001) and confirmed own diagnostic and prognostic value, particularly in differential diagnosis and monitoring recovery of consciousness.

Predictive power of the FOUR and GCS scales

Logistic regression analysis established prognostic value of scales by dividing patients into two groups: favorable outcome (GOSE 5—8)—full recovery or moderate disability; unfavorable outcome (GOSE 1—4)—severe disability with significant functional impairment.

Results demonstrate sensitivity and specificity of scales in predicting outcomes **(Table 5)**.

ROC analysis revealed no significant differences between the FOUR and GCS scales at baseline (Δ=0.02) and follow-up (Δ=0.011) assessments. At final assessment, we found a correlation between GCS speech response and GOSE recovery that confirmed its validity in assessing cognitive function.

Prognostic value of scales was comparable for the entire sample (Δ=0.053). However, the FOUR scale demonstrated significantly higher discriminatory power and advantage in assessing critical conditions in subgroup of patients with moderate-to-terminal coma (AUC=0.944, p<0.001, Δ=0.202).

Adjusted logistic regression model revealed that minimum FOUR scores (⩽4 points) were an independent predictor of mortality (OR=3.4, 95% CI 2.1—5.6; p<0.001) after adjusting for age (OR=1.8; 95% CI 1.5—2.1; p=0.003) and APACHE II score (OR=2.3; 95% CI 1.9—2.8; p<0.001). OR for GCS score 3 was 2.1 (95% CI 1.3—3.4; p<0.002). The difference in predictive power was ~62%.

Our data on higher prognostic value of the FOUR scale in comatose patients are consistent with several studies. Thus, Chattopadhyay I. et al. [7] demonstrated higher accuracy of the FOUR scale in predicting mortality among patients with TBI. Moreover, high significance of this scale is confirmed by its inclusion in modern multimodal models for predicting favorable outcomes [8]. The FOUR scale as a significant predictor of mortality is confirmed in other prospective studies [9]. At the same time, meta-analysis [10], indicating comparable effectiveness of the GCS and FOUR scales in general population of patients with TBI, emphasize that key advantage of FOUR is revealed precisely when assessing the most severe categories of patients, such as patients in coma. This was the subject of our in-depth analysis.

Prognostic value of scales for chronic impairment of consciousness

This study was based on the sample of 200 patients with ACI, and 33 patients had chronic impairment of consciousness.

Distribution by etiology of disease was as follows: 27 (81.8%) patients with stroke; 4 (12.1%) patients with TBI; 2 (6.1%) patients with focal brain lesions.

Analysis of consciousness in 33 patients with chronic impairment of consciousness revealed the following structure of clinical states: 12 (36.4%) patients were classified as minimally conscious (−); 16 (48.5%) patients with low level of consciousness (+); 5 (15.2%) patients with unresponsive wakefulness syndrome.

Mean length of hospital-stay was 113.71±48.38 days.

Logistic regression revealed significant differences in prognostic effectiveness of scales (Δ=0.191). We obtained the following data using the CRS-R as a criterion (conventionally: favorable outcome — >6 points, unfavorable outcome —<6):

— FOUR demonstrated high discriminatory ability (AUC=0.936);
— GCS demonstrated significantly lower performance (AUC=0.745, $p< 0.001$).

Our results confirm superiority of the FOUR scale (AUC=0.936 vs. 0.745) in predicting clinical outcomes, especially in differentiating severe illness **(Table 6)**.

Table 6. **ROC analysis of logistic prediction model for the FOUR and GCS scales**

Scale	AUC	95% CI
FOUR	0.936	0.902; 0.969
GCS	0.745	0.668; 0.823
Difference (Δ)	0.191	0.234; 0.146

Discussion

Analysis revealed significant limitations of GCS scale: no assessment of brainstem reflexes, unsignificant assessment of oculomotor and motor responses in patients with impaired consciousness and excessive reliance on speech response. The last one is often impossible to be assessed in patients with acute cerebral insufficiency (aphasia, intubation, tracheostomy). Furthermore, motor component of GCS scale duplicates total score and reduces its informativeness. Unlike GCS, FOUR scale has key advantages: assessment of brainstem reflexes allowing for monitoring of dislocation syndrome; consideration of respiratory center function in intubated patients; available specific motor tests (thumbs-up, peace sign) applicable without verbal communication. FOUR scale demonstrates high correlation with the CRS-R that makes it a valuable tool for diagnosis of coma recovery and assessment of chronic impairment of consciousness. Simplicity determines FOUR scale as effective screening tool for follow-up of patients with prolonged impaired consciousness, especially in case of short available time or small experience.

Simplicity and fast results are important aspects for implementation of any scale in routine practice. In this regard, FOUR scale demonstrates its worth. The authors confirm that its use is as easy for medical staff as GCS scale [11]. Furthermore, importance of dynamic assessment of consciousness is emphasized. Prognostic value of FOUR score at repeated assessments may be higher compared to baseline examination [12]. These advantages of FOUR scale are confirmed in a systematic review [13] where the authors recognize FOUR scale as a significant tool for predicting outcomes in critically ill patients.

FOUR and GCS scales demonstrate comparable correlation in assessing clinical status, but FOUR scale has higher prognostic value for in-hospital mortality. A key difference is that minimal FOUR scores are associated with higher risk of death compared to similar GCS scores. This is explained by more comprehensive assessment of consciousness (patients with GCS score 3 can have different FOUR scores). Impairment of consciousness correlates with SOFA and APACHE II scores, as well as with decreased functional capacity (RRI). FOUR scale demonstrates 3-fold increase in mortality risk with minimal scores (compared to FOUR >4) after adjustment for age and APACHE II. This confirms importance of assessing brainstem function that is absent in GCS scale. In the absence of significant differences between scales, FOUR scale may be used to predict outcomes and determine management strategies not only in critical illness but also in all cases of cerebral insufficiency.

Analysis of relationships between FOUR, GCS and PICS index revealed weak direct correlation. This result demonstrates that recovery in patients with cerebral insufficiency is largely determined by quality of medical care and support rather consciousness level alone. This underscores the role of multidisciplinary rehabilitation approach in intensive care, where the key factor is not only stabilization of vital functions but also early comprehensive rehabilitation.

Thus, FOUR scale is a significant and versatile tool for quantitative monitoring of acute impairment of consciousness. It is comparable to half-century-old “gold standard” GCS when used in non-cerebral patients, but has several advantages in patients with acute cerebral insufficiency (easy use, rapid implementation and presentation of sufficient clinical information to determine management strategies and predict outcomes).

Conclusion

Thus, FOUR scale may be used for management of patients with acute cerebral insufficiency to assess status of acute lesion and subsequent chronic impairment of consciousness.

Author contribution:
Concept and design of the study — Belkin A.A.
Collection and analysis of data — Arslanov O.Z., Belkin A.A., Nagaev N.S.
Statistical analysis — Arslanov O.Z., Belkin A.A., Kulikov A.V., Nagaev N.S.
Writing the text — Arslanov O.Z.
Editing — Belkin A.A., Kulikov A.V., Nagaev N.S.

No conflict of interests to declare.

REFERENCES

1. Teasdale G, Maas A, Lecky F, Manley G, Stocchetti N, Murray G. The Glasgow Coma Scale at 40 years: standing the test of time. *The Lancet Neurology*. 2014;13(8):844-854. https://doi.org/10.1016/S1474-4422(14)70120-6
2. Giacino JT, Kalmar K, Whyte J. The JFK Coma Recovery Scale-Revised: measurement characteristics and diagnostic utility. *Archives of Physical Medicine and Rehabilitation*. 2004;85(12):2020-2029. https://doi.org/10.1016/j.apmr.2004.02.033
3. Wijdicks EF, Bamlet WR, Maramattom BV, Manno EM, McClelland RL. Validation of a new coma scale: The FOUR score. *Annals of Neurology*. 2005;58(4):585-593. https://doi.org/10.1002/ana.20611
4. Schey JE, Schoch M, Kerr D. The Predictive Validity of the Full Outline of UnResponsiveness Score Compared to the Glasgow Coma Scale in the Intensive Care Unit: A Systematic Review. *Neurocritical Care*. 2025;43(2):645-658. https://doi.org/10.1007/s12028-024-02150-8
5. Brun FK, Fagertun VH, Larsen MH, Solberg MT. Comparison of Glasgow Coma Scale and Full Outline of UnResponsiveness score to assess the level of consciousness in patients admitted to intensive care units and emergency departments: A quantitative systematic review. *Australian Critical Care*. 2025;38(1):101057. https://doi.org/10.1016/j.aucc.2024.03.012
6. Lary A, Abualnaja R, Khojah O, Betar M, Sakhakhni AM, Alsabbagh B, Aljafari DA, Baeshen SK, Fattani A, Aljehani H, Alsulaiman YS, Alaifan T, Jamjoom M. Unlocking Coma Assessments: Exploring Healthcare Professionals' Knowledge and Perception of the Full Outline of Unresponsiveness (FOUR) Score in Saudi Arabia. *Cureus*. 2025;17(1):e78145. https://doi.org/10.7759/cureus.78145
7. Chattopadhyay I, Ramamoorthy L, Kumari M, Harichandrakumar KT, Lalthanthuami HT, Subramaniyan R. Comparison of the Prognostic Accuracy of Full Outline of Unresponsiveness (FOUR) Score with Glasgow Coma Scale (GCS) Score among Patients with Traumatic Brain Injury in a Tertiary Care Center. *Asian Journal of Neurosurgery*. 2024;19(1):1-7. https://doi.org/10.1055/s-0044-1779515
8. Vanat A, Lee JW, Elkhider H, Novy J, Ben-Hamouda N, Oddo M, Rossetti AO. Multimodal Prediction of Favorable Outcome After Cardiac Arrest: A Cohort Study. *Critical Care Medicine*. 2023;51(6):706-716. https://doi.org/10.1097/CCM.0000000000005841
9. Anand KV, Shahid PT, Shameel KK. Evaluating GCS and FOUR Score in Predicting Mortality of Traumatic Brain Injury Patients (TBI): A Prospective Study in a Tertiary Hospital of South Malabar. *Journal of Pharmacy and Bioallied Sciences*. 2024;16(1):S598-S600. https://doi.org/10.4103/jpbs.jpbs_884_23
10. Ahmadi S, Sarveazad A, Babahajian A, Ahmadzadeh K, Yousefifard M. Comparison of Glasgow Coma Scale and Full Outline of UnResponsiveness score for prediction of in-hospital mortality in traumatic brain injury patients: a systematic review and meta-analysis. *European Journal of Trauma and Emergency Surgery*. 2023;49(4):1693-1706. https://doi.org/10.1007/s00068-022-02111-w
11. Pandey S, Sahu AK, Ekka M, Modi P, Aggarwal P, Jamshed N, Bhoi S. Full Outline of Unresponsiveness Score versus Glasgow Coma Scale in Predicting Clinical Outcomes in Altered Mental Status. *Journal of Emergencies, Trauma, and Shock*. 2024;17(2):102-106. https://doi.org/10.4103/jets.jets_76_23
12. Chawnchhim AL, Mahajan C, Kapoor I, Sinha TP, Prabhakar H, Chaturvedi A. Comparison of Glasgow Coma Scale Full Outline of UnResponsiveness and Glasgow Coma Scale: Pupils Score for Predicting Outcome in Patients with Traumatic Brain Injury. *Indian Journal of Critical Care Medicine*. 2024;28(3):256-264. https://doi.org/10.5005/jp-journals-10071-24651
13. Nunes Dos Santos MS, Stayt LC. The effectiveness of FOUR score versus GCS scale in predicting mortality and morbidity in traumatic brain injured patients in intensive care: A systematic review. *Intensive and Critical Care Nursing*. 2025;89:104048. https://doi.org/10.1016/j.iccn.2025.104048

Received 04.08.2025
Accepted 26.11.2026

COMMENT

The authors compared predictive value of two scales for assessment of patients with acute CNS injury regarding mortality and disability. Considering correlation analysis, the authors conclude that FOUR scale is comparable to GCS scale, but offers a more detailed assessment, particularly in intubated patients or patients with speech impairments, where GCS is not always applicable. Thus, the authors promote introduction of FOUR scale into clinical practice as a more advanced alternative or at least an important complement to GCS for monitoring and managing patients with brain injury.

Many similar reports, including original studies and systematic reviews, can be found in the literature including those from the past five years. The majority of studies conclude that both scales have equal prognostic accuracy. According to some data, FOUR scale provides a slightly more accurate prognosis in the most severe group of patients, especially those in coma. This is consistent with structure of the scale more fully representing symptoms caused by brainstem damage.

Thus, the authors confirmed available data in patients with various acute CNS lesions. Regarding comparison of FOUR scale with CRS-R scale, caution is warranted, as the latter scale, firstly, does not characterize comatose patients, and secondly, does not provide overall score of clinical status.

Belousova O.B. (Moscow)