ORIGINAL ARTICLE

ASSESSMENT OF DELIRIUM INCIDENCE IN CRITICALLY ILL PATIENTS USING THE CONFUSION ASSESSMENT METHOD FOR INTENSIVE CARE UNITS

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Highlights: (1) Delirium was identified in nearly one-third of the ICU patients. (2) Sedation was significantly associated with the development of delirium. (3) Mechanical ventilation increased the risk of delirium by more than five times. (4) Patients with delirium had a longer hospitalization.

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ABSTRACT

Objective: To determine the incidence of delirium in critically ill users admitted to the intensive care unit (ICU) and analyze its association with clinical and therapeutic variables using the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU). **Methods:** This prospective, analytical, observational study included 108 adult ICU users. Data were collected using clinical forms and the CAM-ICU tool, administered by trained physiotherapists. The investigated variables included sex, age, length of hospitalization, type of admission, sedation, mechanical ventilation, and the occurrence of delirium. Associations were tested using the chi-square test at a significance level of 5 %. **Results:** Delirium was identified in 29.6% of users. A statistically significant association was found between delirium and the use of sedation ($P = 0.010$) and mechanical ventilation ($P < 0.001$). Users receiving mechanical ventilation were 5.65 times more likely to develop delirium, and those diagnosed with delirium had longer hospital stays. **Conclusion:** Sedation and mechanical ventilation were significantly associated with delirium in critically ill users. These findings reinforce the need for preventive measures, routine delirium monitoring, and multidisciplinary management strategies to minimize adverse outcomes during ICU stays.

Keywords: Delirium; Intensive Care Units; Health Care Evaluation; Incidence; Evaluation Scales.

1 INTRODUCTION

Patients admitted to intensive care units (ICUs) are particularly vulnerable to acute changes in mental status, such as delirium, due to the severity of illness, prolonged use of sedatives, mechanical ventilation, infections, social isolation, and sleep deprivation[1,2]. Delirium is defined as acute brain dysfunction characterized by altered consciousness, disorganized thinking, temporal and spatial disorientation, fluctuating levels of alertness, and perceptual disturbances[3]. Its etiology is multifactorial, involving predisposing factors such as advanced age and comorbidities, as well as precipitating factors such as extended hospital stays and the use of sedative or vasoactive drugs[4].

Delirium is associated with unfavorable clinical outcomes, including increased mortality, prolonged mechanical ventilation and hospitalization, persistent cognitive

impairment, and significantly higher hospital costs[5,6]. Additionally, it represents a considerable source of psychological distress for patients, an emotional burden for families, and complex challenges for healthcare professionals[2,7]. For these reasons, delirium has become an important care quality indicator, especially in services committed to patient safety and monitoring outcomes associated with intensive care units.

The present study was conducted in a public philanthropic hospital that exclusively serves the Unified Health System (SUS) maintained by the Fundação Social Rural de Colatina, Brazil. The institution provides care to adult ICU users with different clinical and surgical conditions, including infectious diseases, oncologic complications, cardiovascular procedures, and other critical conditions. The ICU environment is characterized by constant noise exposure, continuous artificial lighting, reduced external environmental cues, limited family interaction, and frequent invasive procedures, all of which are known contextual factors that may contribute to the onset or worsening of delirium.

Motivated by clinical observations within the service, the research team identified that episodes of delirium were recurrent among ICU users and represented a relevant care concern due to potential risks and negative impacts on care quality. Although the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) is recognized as a validated and reliable tool for screening and monitoring delirium, it was not systematically and routinely applied by all ICU professionals in this institution, being predominantly performed by the psychology team and occasionally by some attending physicians.

Despite the availability of validated screening tools, the lack of systematic monitoring raises concerns regarding early identification, standardized management, and prevention of adverse outcomes. Given its clinical relevance and the need to improve care quality, this study aimed to determine the incidence of delirium in ICU users using the CAM-ICU scale and to assess its association with clinical variables during hospitalization.

2 MATERIAL AND METHODS

2.1 Study Design and Setting

This was a prospective, analytical, observational study with a quantitative approach, carried out between June and September 2024 in the adult intensive care units (ICUs) of a public philanthropic hospital located in Espírito Santo, Brazil, fully funded by the Unified Health

System (SUS), and maintained by the Fundação Social Rural de Colatina. The institution provides care to critically ill users with medical and surgical conditions of varying complexity, including infectious, cardiovascular, oncological, and postoperative complications.

2.2 Participants and Eligibility Criteria

The study included users aged ≥ 18 years of both sexes, admitted to the ICU for > 24 h, with clinical conditions that allowed verbal or gestural response at the time of assessment. The exclusion criteria were as follows: previously diagnosed neurological or cognitive impairment, inability to respond to simple commands, refusal to participate by the user or legal proxy, or ICU stay shorter than 24 h due to discharge, hospital transfer, or death.

2.3 Ethical Procedures

This study was conducted in accordance with the guidelines of Resolution No. 466/12 of the Brazilian National Health Council. The project was approved by the Research Ethics Committee under approval number 6.855.476 and CAAE: 79953924.0.0000.5062. Data collection began only after obtaining informed consent from the user or their legal representatives. All data were anonymized and restricted to the research team to ensure confidentiality of the participants.

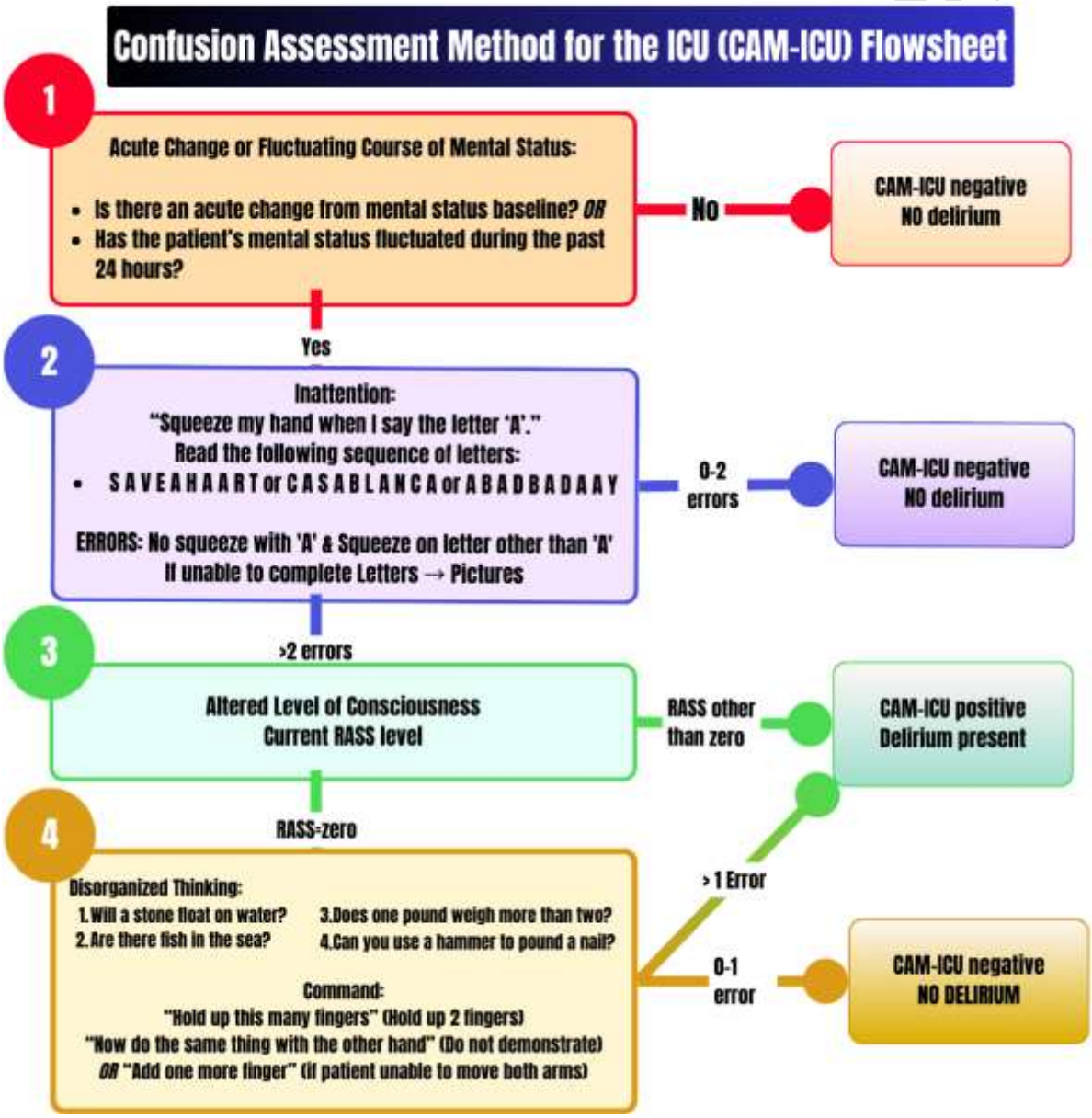
2.4 Data Collection Procedures

Data were collected by four physiotherapist researchers employed at the institution who had experience working in adult ICUs. Before initiating the study, they underwent standardized training on the application of the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU), which included theoretical instruction, visual case-based simulations, practical bedside demonstrations, supervised assessments, and inter-rater reliability reviews. Training followed the guidelines from the official CAM-ICU manual (Ely & Pun, 2016).

The CAM-ICU was administered at the bedside every 24 h for the first five days following ICU admission. For users who remained in the ICU without developing delirium during this period, assessments were performed on alternate days until their discharge or death. If delirium was identified after the fifth day, daily assessment was resumed for five consecutive days or until the symptoms remitted.

Demographic, clinical, and therapeutic data were extracted from electronic medical records and the institutional information system (Magma®, version 4.0), including ICU and hospital length of stay, APACHE II and SOFA scores, exposure to mechanical ventilation, sedation, analgesia, vasoactive drugs, renal replacement therapy, and final clinical outcomes. The assessment process and follow-up strategies are illustrated in **Figure 1**.

Figure 1. Flowchart of the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU)



Source: Adapted from Ely, 2016[10].

2.5 Data Quality Control

To ensure data reliability, all records were double-checked by an independent researcher, and 10% of the sample was randomly audited for quality control to identify transcription issues, missing values and inconsistencies.

2.6 Data Analysis

Data were tabulated using Microsoft Excel® and analyzed using GraphPad Prism® version 9.0. Categorical variables were analyzed using the Chi-square or Fisher's exact test, when appropriate. Statistical significance was set at $p < 0.05$ (two-tailed).

3 RESULTS

A total of 50 users were included between June and September 2024, with equal sex distribution (n = 25 men; n = 25 women). The predominant age group was 60–69 years (n = 21). ICU stay ranged from 1 to 56 days, and most users remained in the ICU for up to 10 days (n = 31). A descriptive summary of the clinical characteristics and ICU interventions is presented in Supplementary Tables 1 and 2.

A total of 14 users (28%) were diagnosed with delirium during their ICU stay according to CAM-ICU assessments. Among these, users received sedation/analgesia (n = 13; 92.8%), vasoactive drugs (n = 11; 78.5%), invasive mechanical ventilation (n = 10; 71.4%), and renal replacement therapy (n = 2; 14.2%). Only one user was exposed to all the interventions.

Data on CAM-ICU assessments across the first five days and subsequent monitoring are presented in Table 3.

Table 3: Delirium Assessment Using the CAM-ICU Scale During the First Five Days of ICU Stay.

Pacients	ICU Admission	Day 1 Assessment	Day 2 Assessment	Day 3 Assessment	Day 4 Assessment	Day 5 Assessment	Assessment from Day 6 Onward – if Delirium Occurred	
1	11-Jun	1	1	1	1	1	1 - Discharge	-
2	11-Jun	1+2 - Without delirium	1+2+3 - Delirium	1+2 - Without delirium	1+2 - Without delirium	1+2 - Without delirium	1+ 2 - Delirium by night (day 6)	Without delirium
3	11-Jun	1	1	1	1	1	-	-
4	13-Jun	1	1	1	1	Discharge	-	-
5	13-Jun	1	1	1	1	1 - Discharge	-	-
6	16-Jun	1	1	1	1	1 - Discharge	-	-
7	17-Jun	1	1	1+2+3+4 - Without delirium	1	1	-	-
8	17-Jun	1	1	1	1	1	-	-
9	17-Jun	1	1	1	1	1	-	-
10	18-Jun	1	1	1	1	1	-	-
11	21-Jun	1	1	1	1	1	-	-
12	19-Jun	1	1	1	1	1	-	-
13	20-Jun	1	1	1	1	1	-	-
14	24-Jun	1	1	1	1	1	-	-
15	25-Jun	1	1	1	1	1+2+3 - Delirium	1+2+3 - Delirium	1+2 - Without delirium
16	26-Jun	1	1	1	1	1	-	-
17	27-Jun	1	1	1	1	1	-	-
18	1-Jul	1	1 + 2 + 3 - Delirium	1 + 2 + 3 - Delirium	1 + 2 + 3 - Delirium	1+2	Delirium by day 28, 29/07 e 05,06/08	-
19	3-Jul	1	1	1	1	1	Death (07/08)	-
20	4-Jul	1 +2	1	1	1	Delirium	Discharge to ward	-
21	8-Jul	1+2 - Without delirium	1 + 2 - Without delirium	1 + 2 - Without delirium	1 + 2 - Without delirium	1		-
22	10-Jul	1	1 + 2 - Without delirium	1	1	1	Delirium (14,19,20/07)	Without delirium
23	16-Jul	1	1	1	1	1	-	-
24	30-Jul	1+2 - Without delirium	1	1	1	1	-	-
25	30-Jul	1+2 - Without delirium	1	1	1	1	-	-
26	31-Jul	1	1 + 2 - Without delirium	1	1	1	-	-
27	31-Jul	1+2 - Without delirium	1	1	1	1	Delirium 10/08	Without delirium
28	31-Jul	1 + 2 + 3 - Delirium	Aggressive	Aggressive	Aggressive	Delirium	Delirium - death	-

29	1-Aug	1	1	1	1 + 2 - Without delirium	1	-	-
30	2-Aug	1 + 2 - Without Delirium	Delirium	1 + 2 + 3 - Without delirium	1	1	-	-
31	7-Aug	1	1	1	1	Delirium	Delirium 12/08 e 25/08	-
32	8-Aug	1	1	1	1	1	-	-
33	9-Aug	1	1 + 2 + 3 + 4 - Without	1	1	1	-	-
34	14-Aug	1	1	1	1	1	-	-
35	15-Aug	1 + 2 - Without delirium	1	Delirium	1+2 - Without delirium	1	-	-
36	16-Aug	1 + 2 - Without delirium	1	1	1	1	-	-
37	17-Aug	1	1	1	1	1	-	-
38	21-Aug	1	1	1	1	1	Delirium (28/08)	Discharge
39	26-Aug	1	1	1	1	1	-	-
40	27-Aug	1	1	1	1	1	-	-
41	28-Aug	1	1	1	1	1	-	-
42	28-Aug	1	1	1	1	1	-	-
43	29-Aug	1 + 2 + 3 + 4 - Without	1 + 2 - Without delirium	Delirium	1 + 2 - Without delirium	1	-	-
44	31-Aug	1 + 2 - Without delirium	1 + 2 - Without delirium	Delirium	Delirium	Delirium	-	-
45	1-Sep	1	1	1	1	1	-	-
46	4-Sep	1	1	1	1	1	-	-
47	5-Sep	1	1	1	1		-	-
48	7-Sep	1	1	1	delirium	1 + 2 - Without delirium	-	-
49	10-Sep	1	1	1	1	1	-	-
50	12-Sep	1	1	1	1	1	-	-

Source: Institutional electronic records (SoulMV®) and Magma® hospital database.

The associations between delirium and clinical variables are presented in Table 4.

Table 4 - Analysis of Delirium by Comparison of Variables Using the Chi-Square Test

Variables	With Delirium (n)	Without Delirium (n)	*p*-value
Age			
18 - 60 Years	5	12	0,8732
61 years or older	9	24	
Length of Hospital Stay			
Up to 5 days	0	1	0,7528
6–10 days	1	10	
11–15 days	2	6	
16 days or more	11	19	
Length of ICu Stay			
Up to 5 days	2	11	0,9237
6–10 days	3	15	
11–15 days	1	3	
16 days or more	8	7	
APACHE II Score			
0 - 9	1	6	0,3746
10 - 19	9	20	
20 - 29	2	7	
30 - 100	2	1	
Invasive Mechanical Ventilation			
YES	11	27	0,7906
NO	3	9	
Renal Replacement Therapy			
YES	2	5	0,971
NO	12	31	
Extended Visitation			
YES	8	13	0,1761

NO	6	23	
Sedation/Analgesia			
YES	13	22	0,0278
NO	1	14	
Vasoactive Drugs			
YES	11	9	0,0005
NO	3	27	
Outcome			
Discharge	11	31	0,3122
Death	2	2	
Transfer	0	1	
No Outcome (still hospitalized)	1	2	

Source: Authors, 2025.

Only sedation/analgesia (p = 0.0278) and vasoactive drug use (p = 0.0005) were significantly associated with delirium occurrence. No statistically significant associations were identified between age, ICU length of stay, hospital length of stay, APACHE II score, invasive mechanical ventilation, renal replacement therapy, extended visitation, or final clinical outcomes.

Most users diagnosed with delirium were discharged from the ICU (n = 11, 78.5%). Two users (14.2%) died during hospitalization, and one user (7.1%) remained hospitalized at the end of the data collection period.

4 DISCUSSION

Delirium is a multifactorial neuropsychiatric condition frequently observed in critically ill users, resulting from complex interactions between baseline vulnerabilities, acute physiological stressors, and environmental exposure[1–3]. In this study, the incidence of delirium was 28%, which falls within the lower range of rates described in the literature, where variability may reach 20% to 80% depending on the population profile, assessment frequency, and diagnostic method[4–6]. This percentage was lower than that reported in a retrospective cohort study, in which 72.6% of ICU users developed delirium, requiring more intensive

interventions[7]. Such differences may be partially explained by contextual factors, including the characteristics of the studied institution, distinct clinical profiles, sedation protocols, and frequency of structured delirium screening.

The fact that the CAM-ICU application in the hospital was not routinely performed by all ICU professionals, being primarily conducted by psychology staff and a limited number of physicians, may also contribute to underdetection, especially in hypoactive presentations, which are known to be frequently overlooked in daily practice. Studies have indicated that screening frequency and assessor training significantly influence the measured incidence levels[8-10].

Advanced age has traditionally been reported as one of the strongest predisposing factors for delirium, as aging is associated with cerebral structural changes, reduced neurotransmitter reserves, and increased vulnerability to metabolic disturbances[11]. Although most users in this study were ≥60 years old, no statistically significant association between age and delirium was found. This result may have been influenced by the sample size, clinical heterogeneity, and predominance of postoperative cardiovascular drug users, which may have diluted the effect of age as an isolated predictor.

Sedation and vasoactive drugs demonstrated statistically significant associations with delirium in this study, consistent with findings that correlate sedative accumulation, polypharmacy, and hemodynamic instability with impaired cognitive processing and altered consciousness[12–14]. These associations reinforce the importance of balancing hemodynamic safety with neurocognitive protection, adopting light sedation strategies, daily awakening protocols, and using validated screening tools, as recommended by international guidelines.

The ICU environment in the studied institution is characterized by continuous artificial lighting, noise exposure, reduced temporal orientation, and limited external stimulation, which may exacerbate disorientation and sensory misperception. Evidence shows that environmental modifications, such as circadian-friendly lighting, noise reduction, and family engagement, may contribute to non-pharmacological delirium prevention[15–17].

This discussion is aligned with the concept of humanized critical care, which, in the context of the Unified Health System (SUS), is grounded in principles such as integrality, dignity, communication, shared decision-making, and psychosocial protection. Humanized care is not limited to emotional support; it also encompasses clinical-environmental strategies that promote cognitive safety and minimize avoidable iatrogenesis.

This study has some limitations, including the small sample size, single-center design, incomplete 24-hour screening, and potential underestimation of delirium episodes. However, our findings provide relevant insights for clinical practice within public ICU settings, especially by demonstrating the need for structured delirium surveillance, training optimization, multidisciplinary involvement, and environmental humanization strategies.

Based on these findings, the implementation of systematic and standardized delirium monitoring should be prioritized as part of routine care in public ICUs, supported by continuous professional development, regular use of validated screening tools, and non-pharmacological preventive strategies. Consolidating such practices within SUS-funded institutions may contribute to better neurocognitive outcomes, safer recovery trajectories, and more consistent quality-of-care indicators, reinforcing a culture of clinical safety and humanized evidence-based critical care.

CONCLUSION

Delirium remains an important clinical and safety concern in public ICUs, and its 28% incidence in this study highlights the relevance of systematic screening and prevention strategies among critically ill users. The significant association between delirium and exposure to sedatives and vasoactive drugs reinforces the need for tailored pharmacological management aligned with evidence-based sedation protocols. Considering the contextual characteristics of the institution, these findings support the incorporation of structured delirium monitoring as part of routine care, guided by trained multidisciplinary teams and standardized assessment tools. Strengthening these practices within SUS-funded ICUs may improve neurocognitive outcomes, reduce preventable complications, and advance care quality and safety in critical care settings.

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Supplementary Material

Supplementary Table 1. Clinical characteristics and evolution of ICU users included in the study.

Pacient	Age	Reason for ICU Admission	Length of Hospital Stay (days)	Length of ICU Stay (days)	SOFA and APACHE II Scores	Outcome
1	83	General Condition Deterioration	7	6	24 APACHE	discharge
2	87	Sepsis	40,69	40,68	4 SOFA e 59,68 APACHE	death
3	58	Postoperative Myocardial Revascularization	20	6	15 APACHE	discharge
4	57	Postoperative Left Total Nephrectomy + Retroperitoneal Lymphadenectomy via Laparotomy	5	5	10 APACHE	discharge
5	64	Postoperative Myocardial Revascularization	32	14	2 SOFA e 9 APACHE	discharge
6	66	Arteriovenous Fistula with Type II Steal Syndrome	10	5	20 APACHE	discharge
7	47	Pulmonary Abscess – Pulmonary Cavitations	32,8	11,05	6 APACHE	discharge
8	67	Radical Prostatovesiculectomy + Bilateral Pelvic Lymphadenectomy	6	5	11 APACHE	discharge
9	59	Diarrhea of Undetermined Cause	69,11	55,9	14 APACHE	discharge
10	68	Febrile Neutropenia, Pancytopenia, Acute Kidney Injury (AKI)	27,7	26,96	8 SOFA e 37 APACHE	discharge
11	57	Postoperative Valve Replacement	16,88	5	11 APACHE	discharge
12	19	Idiopathic Thrombocytopenic Purpura	13	6	3 APACHE	transfer
13	68	Postoperative Valve Replacement + Atrial Septal Defect (ASD) Repair	16	9	10 APACHE	discharge
14	79	HighGrade Serous Ovarian Carcinoma	10	8	13 APACHE	discharge
15	76	Postoperative Valve Replacement + Myocardial Revascularization	58	51	14 APACHE	discharge

16	68	Postoperative Myocardial Revascularization	8	5	17 APACHE	discharge
17	46	Postoperative Mitral and Tricuspid Valve Replacement	21	8	16 APACHE	discharge
18	82	Atrial Fibrillation with Rapid Ventricular Response, Decompensated Heart Failure (Profile B)	49,68	49,61	13 APACHE	discharge
19	60	Postoperative Myocardial Revascularization	11,7	6,91	11 APACHE	discharge
20	74	Skin Cancer Resection with Temporal Muscle and Myocutaneous Flap Reconstruction	30	28	13 APACHE	discharge
21	50	Exploratory Laparotomy + Adhesiolysis + Sigmoid Segment Resection	48,17	42,88	13 e 10 APACHE	
22	67	Coronary Insufficiency and Unstable Angina	15,78	1,29, 6,91	8 e 17 APACHE	
23	72	Postoperative Myocardial Revascularization	15,08	7,81	8 APACHE	discharge
24	67	Postoperative Valve Replacement	44,2	20	28 e 12 APACHE	discharge
25	69	Postoperative Myocardial Revascularization	11,14	5	18 APACHE	discharge
26	67	SecondDegree Atrioventricular Block	7,22	6,08	20 APACHE	discharge
27	55	Critical Lower Limb Ischemia (Right), Acute Cholecystitis	24,75	20,3	22 APACHE	óbito
28	84	Severe Sepsis	20,65	19,01	5 SOFA e 17 APACHE	óbito
29	66	Cardiogenic Pulmonary Edema	36,3	15,28, 7,14	21 APACHE	óbito
30	78	Postoperative Retosigmoidectomy + Lymphadenectomy	7,93	5	16 APACHE	discharge
31	58	Decompensated Heart Failure	32,75	28,75	10 APACHE	discharge
32	76	Postoperative Subaortic Membrane Resection	10,93	7,09	12 APACHE	discharge
33		Threatening Lower Limb Ischemia (Right), Postoperative AortoAortic Bypass with Prosthesis	43,68	34,76	17 APACHE	discharge

34	57	Postoperative Myocardial Revascularization	9,17	5,95	14 APACHE	discharge
35	78	Postoperative Myocardial Revascularization	20,98	7,86	31 APACHE	discharge
36	65	Postoperative Subaortic Membrane Resection	8,96	5	24 APACHE	discharge
37	50	Postoperative Valve Replacement	16	7	11 APACHE	discharge
38	68	Intramural Aortic Hematoma	24,86	23,9	16 APACHE	discharge
39	62	Exploratory Laparotomy + Terminal Colostomy	18,94	5	6 APACHE	discharge
40	61	Postoperative Subaortic Membrane Resection	8,83	5	12 APACHE	discharge
41	66	STElevation Acute Coronary Syndrome (STEACS) and Postoperative Myocardial Revascularization	20,16	9,79	16 APACHE	discharge
42	62	Critical Lower Limb Ischemia (Right)	11	6	21 APACHE	discharge
43	89	Pulmonary Focus Sepsis	14,03	11	2 SOFA 23 APACHE	discharge
44	62	Postoperative Myocardial Revascularization	17	10	14 APACHE	discharge
45	41	Substenotic Vegetating Lesion in Sigmoid Colon	17,93	16,71	8 APACHE	discharge
46	63	Postoperative Myocardial Revascularization	8	5	12 APACHE	discharge
47	53	Postoperative Mechanical Mitral Valve Replacement	12	6	13 APACHE	discharge
48	55	Aortic Aneurysm/Dissection	17	5,29	6 APACHE	no
49	63	NonST Elevation Acute Coronary Syndrome (NSTEACS) and Postoperative Myocardial Revascularization	21	5	9 APACHE	discharge
50	77	Postoperative Myocardial Revascularization	33	12	1 SOFA e 12 APACHE	discharge

Source: SoulMV electronic medical record and Magma database

Supplementary Table 2. Therapeutic interventions of ICU users included in the study.

Pacient	Age	Invasive Mechanical Ventilation	Renal Replacement Therapy	Delirium	Extended Visitation	Sedation	Vasoactive Drugs
1	83	no	no	no	yes	no	no
2	87	yes - 1	no	yes	yes	yes	yes
3	58	yes - 1	no	no	no	no	yes
4	57	yes -1	no	no	no	yes	no
5	64	yes - 1	no	no	yes	yes	yes
6	66	no	yes	no	no	no	yes
7	47	yes, 1	no	no	no	yes	yes
8	67	no	no	no	no	yes	no
9	59	yes - 5	yes	no	yes	yes	yes
10	68	yes - 1	yes	no	yes	yes	yes
11	57	yes - 1	no	no	no	no	yes
12	19	no	no	no	yes	no	no
13	68	yes - 1	no	no	no	no	yes
14	79	no	no	no	no	yes	yes
15	76	yes - 6	no	yes	yes	yes	yes
16	68	yes - 1	no	no	no	no	yes
17	46	yes - 1	no	no	no	yes	yes
18	82	yes - 6	no	yes	yes	yes	yes
19	60	yes - 1	no	yes	yes	yes	yes
20	74	yes - 2	no	yes	no	yes	no
21	50	yes - 1	no	no	yes	yes	yes
22	67	yes - 1	no	no	no	yes	yes
23	72	yes - 1	no	no	yes	yes	yes
24	67	yes - 1	yes	yes	yes	yes	yes
25	69	yes - 1	no	no	no	no	yes
26	67	no	no	no	no	no	yes
27	55	yes- 1	yes	no	yes	yes	yes
28	84	yes - 5	no	yes	no	yes	yes
29	66	yes - 2	no	no	yes	yes	yes
30	78	no	no	no	yes	yes	no
31	58	no	no	yes	yes	yes	no
32	76	yes - 1	no	no	yes	yes	yes
33		yes - 10	yes	yes	no	no	no
34	57	yes - 1	no	no	no	no	no
35	78	yes - 1	no	yes	no	yes	yes
36	65	yes - 1	no	no	no	yes	yes
37	50	no	no	yes	yes	yes	yes
38	68	no	no	no	no	no	yes
39	62	yes - 1	no	no	yes	yes	no
40	61	yes - 1	no	yes	no	yes	yes
41	66	yes - 1	no	no	no	yes	yes
42	62	no	yes	no	no	yes	no
43	89	no	no	yes	yes	yes	yes
44	62	yes - 2	no	no	no	no	yes
45	41	yes - 2	no	no	yes	yes	no
46	63	yes - 1	no	no	no	no	yes
47	53	yes - 1	no	no	no	no	yes
48	55	yes - 1	no	yes	yes	yes	yes
49	63	yes - 1	no	no	no	yes	yes
50	77	yes - 1	no	no	no	yes	yes

Source: SoulMV electronic medical record and Magma database