Society of Medical Education & Research

2022, Volume 2, Page No: 173-186
ISSN: 3108-5059

Asian Journal of Ethics in Health and Medicine

Mandatory Clinical Ethics Consultation and Its Influence on Resource Allocation and Conflict Resolution in Medical and Surgical ICUs

Nur Aina Hamzah[1]*, Muhammad Zaki[2]

[1]Department of Medical Ethics, Faculty of Medicine, Universiti Kebangsaan Malaysia, Bangi, Malaysia.
[2]Department of Health Policy and Ethics, Faculty of Medicine, Universiti Sains Malaysia, George Town, Malaysia.

***E-mail** ✉ nur.aina@gmail.com

Abstract

Mandatory ethics consultation is automatically activated whenever predefined institutional criteria are met. Medical and surgical ICUs differ substantially in case mix, illness trajectories, and decision-making dynamics. Evidence comparing the effects of mandatory ethics consultation across these two settings remains sparse. This study was designed to assess how compulsory ethics consultation influences resource consumption, the frequency and resolution of ethical disputes, and family satisfaction among critically ill patients in medical versus surgical intensive care units, and to determine the key predictors of these outcomes. This study employed a hybrid retrospective–prospective cohort design and was performed at a university-affiliated tertiary referral hospital. All adult patients admitted to intensive care units who received a clinical ethics consultation (CEC) from January 1, 2013, to December 31, 2020, were considered for inclusion. The final sample consisted of 1,150 individuals: 822 managed in the medical ICU and 328 in the surgical ICU. After the adoption of compulsory CEC, overall resource consumption in both units fell progressively every two years. Patients in the medical ICU had markedly longer total hospital stays, more days on mechanical ventilation, and a longer delay between ICU admission and CEC compared to their surgical counterparts. In the medical ICU, the presence of metastatic or terminal malignancy and episodes of cardiac arrest were the dominant drivers of extended stay and greater resource demands, while in the surgical ICU, the Glasgow Coma Scale (GCS) score was the strongest independent predictor. Over the study period, the frequency of documented ethical conflicts declined steadily every two years in both settings. Paradoxically, the surgical ICU recorded higher overall rates of ethical disputes. In the medical ICU, risk factors for ethical conflict included advanced age, incurable cancer, vasopressor/inotrope requirement, and lower GCS scores. In the surgical ICU, only marital status and GCS score consistently predicted such conflicts. Across both units, family members expressed strong satisfaction with the performance and support provided by the ethics consultation service. The introduction of mandatory CECs affected medical and surgical ICUs differently in terms of resource utilization and the types of ethical challenges encountered. These findings can help ethics consultants and clinical teams tailor their approaches to the unique needs of each specialty. Institutions may benefit from adopting mandatory CEC policies and creating specialty-specific education and training initiatives to enhance the quality of end-of-life care provided in intensive care settings.

Keywords: Clinical ethics, Medical and Surgical ICUs, Consultation, Conflict resolution

Introduction

Clinical ethics consultation (CEC) has been adopted widely in hospitals as a means to enhance communication and address conflicts rooted in personal values [1-4]. Ethical challenges arise frequently for healthcare professionals working in intensive care units (ICUs), yet many clinicians lack formal training or adequate preparation to navigate these difficult situations [5, 6]. Research has demonstrated that CEC can help limit non-beneficial or undesired interventions, mitigate ethical disagreements, and support both care teams and families

Access this article online https://smerpub.com/

Received: 02 August 2022; **Accepted:** 23 November 2022

How to cite this article: Hamzah NA, Zaki M. Mandatory Clinical Ethics Consultation and Its Influence on Resource Allocation and Conflict Resolution in Medical and Surgical ICUs. Asian J Ethics Health Med. 2022;2:173-86. https://doi.org/10.51847/NSXbOXWFhg

during end-of-life decision-making [7-10]. Additionally, one investigation emphasized the substantial demand for CEC within ICUs—particularly in matters concerning end-of-life care—and urged institutions to prioritize its availability [3].

Mandatory CEC is initiated under circumstances specified by institutional policies. Several studies have advocated for required consultations under defined conditions to aid clinical decision-making, reduce individual bias, improve communication, and support high-quality care [11, 12]. Drawing on the consensus recommendations issued by multiple critical care organizations [13] and the ethical guidelines of the American Medical Association [14], one study surveyed leading academic hospitals in the United States. It found considerable variation in both the presence and content of mandatory CEC policies and called for a more standardized approach nationwide [12]. Another study showed that implementing a mandatory policy increased consultation volume, potentially strengthening collaboration between ethics consultants and clinicians, enhancing physicians' ethical competence, and boosting awareness among both nurses and physicians regarding available ethics resources [11].

In intensive care settings, the decision to withhold or withdraw life-sustaining treatment is the most frequent trigger for a CEC request [15], particularly when a patient's prognosis becomes extremely poor. These decisions—and the timing of them—often lead to ethical and emotional strain for patients' families as well as ICU clinicians [11, 16-19]. One study noted that Japanese physicians tended to hold more negative views toward withdrawing life-support and recommended systems that better support clinicians in making appropriate end-of-life decisions [20].

Different specialties and clinical units encounter distinct ethical challenges because of their unique characteristics. Bosk observed that surgeons often assume more personal responsibility for patient outcomes than many other specialists [21]. Another study found that the ethical concerns prompting CEC differed between surgical and non-surgical teams: surgical clinicians more often requested consultations about withholding or stopping life-sustaining therapies, while non-surgical teams more commonly sought help with discharge-related issues [22]. ICUs also differ from other hospital units due to high levels of uncertainty, rapidly changing clinical conditions, and frequent disagreements about treatment goals, futility, and appropriateness—especially for patients approaching the end of life.

Complex interpersonal relationships further complicate ICU ethics. One of the most difficult dynamics involves the relationship between intensivists and surrogate decision-makers, as intensivists often meet families for the first time during crises and must quickly build trust [23]. Surgical ICUs add another layer of complexity due to the special surgeon–patient relationship. A prior study analyzed interactions among surgeons, intensivists, patients, and families and identified ethical issues unique to surgical critical care [23]. Surgeons' values and perspectives can differ from those of intensivists, leading to divergent preferences about end-of-life decisions. Surgeons, for instance, may be particularly resistant to discontinuing life-sustaining treatments for postoperative patients, especially when facing suboptimal outcomes or perceived surgical errors [24, 25], potentially resulting in ethical conflicts and prompting CEC involvement.

End-of-life care can also vary depending on the ICU's administrative model. In open units, surgeons retain primary responsibility for patient care, whereas in closed or intensivist-led units, intensivists direct care while surgeons serve as consultants. When surgeons lead care, the dominant goal is often survival at all costs. When intensivists direct care—and must consider resource allocation—the focus shifts toward relieving suffering and protecting quality of life [23, 26, 27]. Despite these differences, evidence comparing end-of-life decision-making or ethical conflicts between medical and surgical ICUs has been lacking.

To date, no research has thoroughly evaluated long-term or comprehensive impacts of mandatory CEC policies across medical versus surgical ICUs. Therefore, this study sought to examine how mandatory CEC affects resource utilization, patterns of ethical conflict, and family satisfaction in critically ill patients treated in medical and surgical ICUs, as well as to identify the factors that predict these outcomes.

Materials and Methods

The mandatory CEC policy, CEC team and the CEC process

This investigation, which incorporated both retrospective and prospective components, was carried out at Kaohsiung Medical University Hospital—a large tertiary, university-affiliated center in southern Taiwan with a capacity of 1,300 beds. The medical ICU at this

institution consists of medical, cardiovascular, and neurological units, whereas the surgical ICU comprises surgical, trauma, cardiovascular, and neurosurgical units. The hospital uses a closed ICU model in which intensivists manage patients as the primary care providers; in the surgical ICU, this role is assumed by intensivists with surgical training.

The hospital introduced a formal CEC policy in October 2011, outlining explicit criteria for when ethics consultations must be initiated and detailing the steps involved in the consultation process. Structured documentation, including standardized request forms and consultation records, has been carefully created to support this system. The ethics team also works to cultivate an atmosphere where staff and patients feel comfortable bringing forward ethical questions or concerns. **Table 1** summarizes the mandatory CEC policy, the composition of the CEC team, and the procedures used during consultations.

Table 1. Summarizes the creation of the mandatory CEC framework, describes the members of the ethics consultation team, and details the workflow used for conducting consultations.

Section	Paraphrased Content
The Mandatory CEC Policy	In 2013, following amendments to Taiwan's Hospice Palliative Care Act [28], our tertiary hospital introduced a compulsory CEC policy. Ethics consultation became obligatory for every case involving withholding or withdrawal of life-sustaining treatment, regardless of whether the request originated from the patient, family members, or healthcare staff. This policy was designed to enhance the quality of end-of-life decision-making and ensure legal and ethical compliance.
Composition of the CEC Team	The hospital's ethics committee bylaws define the structure of the CEC team, which comprises four core members: • A physician-team leader (a trauma surgeon with >20 years of critical care experience and a graduate degree in bioethics) • A specialist hospice and palliative care nurse practitioner • A medical social worker • A clinical psychologist The team leader identifies ethical dilemmas, facilitates conflict resolution, and serves as the legally required second physician to confirm terminal status. The nurse practitioner offers expert guidance on palliative care and coordinates transfer to hospice when needed. The social worker assesses family dynamics and available support resources. The psychologist provides bereavement support. The team follows each patient until death or discharge.
CEC Activation Process	Requests for CEC can be submitted by patients, surrogates, or clinicians via phone or email, accompanied by a brief application form summarizing the patient's history and the ethical concern. A team member first verifies that the issue is indeed ethical; if not, the case is redirected to the appropriate department. Once confirmed, the team reviews the medical record, conducts bedside visits, and prepares for a formal family meeting.
Structured Family Meeting and Decision-Making Process	A formal family conference is convened with the following steps: 1. The CEC team expresses gratitude and emotional support to both the family and the treating clinical team. 2. The primary clinical team presents the patient's current condition and prognosis. 3. Family members are invited to voice questions and concerns (common worries include fear of patient suffering or guilt over "giving up"). 4. The CEC team clarifies the legal and ethical framework for withdrawing life-sustaining treatment, emphasizing that withdrawal is not abandonment but a shift to comfort-focused care that respects the patient's dignity and prior wishes. 5. If consensus is achieved, the team details the practical steps of withdrawal, encourages family presence throughout the process, and ensures adequate symptom management with analgesics and sedatives. 6. The timing of withdrawal is adjusted according to family preferences to allow relatives to gather for final farewells. 7. CEC team members remain actively involved during the withdrawal procedure itself.
Post-Withdrawal Care	If the patient survives the withdrawal of life-sustaining treatment, the hospice and palliative care nurse practitioner on the CEC team immediately arranges transfer to the inpatient hospice ward and oversees ongoing comfort-oriented care.

Outcome measure

This study focused on three primary outcomes: length of stay (LOS) in the ICU, the nature and resolution of ethical conflicts, and family satisfaction with the end-of-life decision-making process.

The researchers proposed that mandatory clinical ethics consultation (CEC) could shorten LOS by accelerating the resolution of ethical disputes that frequently delay discharge or withdrawal of life-sustaining treatment. Through structured, multidisciplinary intervention, CEC

was expected to foster earlier consensus among patients, families, and care teams, thereby reducing decision-making deadlocks and unnecessary prolongation of intensive care.

Ethical issues—particularly the establishment of clear treatment goals and their alignment with patient values and preferences—formed the core focus of CEC activity. The consultation process was specifically structured to detect, clarify, and resolve these dilemmas, directly shaping how ethical challenges were handled in daily clinical practice.

Family satisfaction was anticipated to improve as a result of CEC, given the intense emotional burden families face during critical illness and end-of-life decisions. By offering a dedicated, empathetic forum in which concerns could be openly expressed, questions answered, and family input genuinely incorporated, CEC aimed to lessen distress, enhance comprehension, and increase overall satisfaction with the care provided to their loved ones.

Length of stay and ethical contexts

The outcomes assessed in this study encompassed ICU length of stay (LOS), overall hospital LOS, number of days on mechanical ventilation, the interval from ICU admission to the ethics consultation, and the time from the consultation to the withdrawal of life-sustaining measures. All of these metrics were evaluated and compared on a semiannual basis. In addition, ethical issues were examined biannually, including disputes over the determination of terminal illness and disagreements occurring among family members, between families and healthcare teams, and within the clinical team itself. Conflicts regarding terminal illness were defined as any uncertainty, disagreement, or ethical dilemma surrounding whether a patient should be classified as terminally ill. Disagreements among family members, between families and care teams, or among clinicians were defined as any situation involving uncertainty or dispute about treatment goals, the futility of interventions, or the appropriateness of care decisions within those interactions.

Family member satisfaction

A research assistant conducted structured interviews with surrogate decision-makers either in person or via telephone, typically within one to two weeks following the patient's death. Informed consent for participation in these interviews was secured during earlier family meetings. All interviewees had been involved in the ethics consultation process. Participants were chosen using convenience sampling and were requested to complete a structured questionnaire using a Likert scale. The questionnaire was created by an expert panel and demonstrated high internal consistency.

Data processing

The study enrolled adult patients (aged ≥18 years) who were admitted to adult intensive care units (ICUs) and underwent a clinical ethics consultation (CEC) between January 1, 2013, and December 31, 2020. Data were retrieved from the hospital's electronic health records, including admission notes, daily progress notes, discharge summaries, family meeting records, and CEC documentation. Variables collected included patient demographics (age, sex, marital status), ICU type (medical, surgical, or subacute respiratory care unit), admission year, primary diagnosis, identity of the surrogate decision-maker, presence of documented advance directives or patient wishes, occurrence of cardiac arrest, use of inotropes/vasopressors, mechanical ventilation or other life-sustaining treatments, and in-hospital mortality. Secondary outcomes comprised ICU and total hospital length of stay, duration of mechanical ventilation, time from ICU admission to CEC request, time from CEC to withdrawal of life-sustaining treatments, and the specific ethical issues addressed.

Upon initiation of a CEC, the ethics consultation team performed a bedside patient evaluation, met with the treating clinical team, reviewed all pertinent medical records, and facilitated family meetings. Structured family meetings focused on decisions regarding withdrawal or withholding of life-sustaining treatments were chaired by the CEC team and attended by members of the ethics consultation service, the primary clinical team, and family members/surrogates. Ethical issues were identified and classified by team consensus based on predefined criteria and were recorded in the official CEC notes at the conclusion of the consultation process.

Two investigators (YKL and YWH), who had participated in the consultations, independently reviewed the records and extracted the study data. Data on family/surrogate satisfaction were gathered between 2020 and 2023. The research protocol received approval from the Institutional Review Board of Kaohsiung Medical University Hospital (KMUH-IRB-20130379).

Statistical analyses

To maintain participant privacy and confidentiality, all information gathered was anonymized and stored using unique participant identifiers without any personally identifiable details.

Trends in length of stay (LOS) over the years were evaluated with the Cuzick nonparametric test for trend [29]. Shifts in the types of ethical issues across successive two-year periods were assessed using the Cochran-Armitage trend test [30, 31]. Associations between continuous clinical variables (or categorical variables treated as numeric) and outcomes such as ICU length of stay, overall hospital length of stay, and duration of mechanical ventilation were examined with Student's t-test or one-way ANOVA, as appropriate. Adjusted analyses for ICU LOS, total hospital LOS, and ventilator days were performed using multiple linear regression that included prespecified covariates. The influence of these covariates on the prevalence of different ethical issues was explored through multivariable logistic regression. Model selection in multivariable analyses relied on likelihood ratio tests. Statistical significance was set at $p < 0.05$, with 95% confidence intervals reported for key estimates. All statistical analyses were carried out using Stata software, version 18.0 (StataCorp LP, College Station, TX, USA).

Results and Discussion

The study ran from 2013 to 2020 and included 1,150 critically ill adults: 822 in the medical intensive care unit and 328 in the surgical intensive care unit.

Surgical ICU patients tended to be younger and were much more likely to have a primary neurologic condition. In the medical ICU, the leading reasons for admission were heart, brain, and lung problems. Children were the most common surrogate decision-makers in both units. Very few patients (roughly 4–5%) had written advance directives, though about one in four had shared their end-of-life preferences verbally or informally.

Cardiac arrests and the need for blood-pressure-supporting drugs were less common in the surgical ICU. Mechanical ventilation was by far the dominant form of life support in both groups. After decisions to stop life-sustaining therapy, around 85–88% of patients in each ICU died during that hospital stay. Consciousness was profoundly reduced across the board, with average Glasgow Coma Scale scores below 5.2.

Over the eight-year period, several time intervals shortened noticeably, especially in the medical ICU: how long patients stayed in the ICU and the hospital overall, how many days they spent on a ventilator, how quickly an ethics consult was requested after admission, and how soon treatment was withdrawn after the consult—all dropped significantly every two years. In the surgical ICU, the duration of ventilation and the time from admission to ethics consultation also became shorter biennially, but the other intervals did not show the same consistent decline.

Table 2. Secular trends and comparison of medical and surgical intensive care units for outcomes biannually

Characteristic	All Years Combined	2013–2014	2015–2016	2017–2018	2019–2020	p-value for trend (Medical)	p-value for trend (Surgical)
Number of patients	Medical: 822 Surgical: 328	Medical: 103 Surgical: 34	Medical: 226 Surgical: 66	Medical: 204 Surgical: 101	Medical: 289 Surgical: 127	—	—
ICU length of stay (days)						0.009	0.075 (not significant)
Mean ± SD	Medical: 17.7 ± 13.2 Surgical: 16.2 ± 12.3	Medical: 19.5 ± 11.6 Surgical: 17.5 ± 14.4	Medical: 17.8 ± 11.8 Surgical: 18.1 ± 11.1	Medical: 16.5 ± 14.7 Surgical: 15.9 ± 13.7	Medical: 17.9 ± 13.6 Surgical: 15.2 ± 10.9		
Median (IQR)	Medical: 15 (9–22) Surgical: 13 (8–22)	Medical: 18 (11–24) Surgical: 14 (9–22)	Medical: 15 (10–22) Surgical: 16 (9–24)	Medical: 13.5 (8–20) Surgical: 12 (8–21)	Medical: 15 (8–24) Surgical: 12 (7–21)		

Total hospital length of stay (days)						0.0006	0.170 (not significant)
Mean ± SD	Medical: 27.1 ± 22.2 Surgical: 22.3 ± 17.8	Medical: 30.6 ± 19.7 Surgical: 21.4 ± 15.8	Medical: 30.3 ± 25.5 Surgical: 26.2 ± 17.9	Medical: 23.4 ± 21.2 Surgical: 20.7 ± 18.6	Medical: 26.1 ± 21.1 Surgical: 21.9 ± 17.5		
Median (IQR)	Medical: 21 (11–37) Surgical: 18 (9–31)	Medical: 26 (15–42) Surgical: 19 (11–28)	Medical: 24 (12–43) Surgical: 21.5 (11–36)	Medical: 16 (9–32.5) Surgical: 14 (8–30)	Medical: 20 (11–34) Surgical: 18 (8–30)		
Duration of mechanical ventilation (days)						<0.001	0.014
Patients on ventilator	Medical: 812 Surgical: 325	Medical: 103 Surgical: 34	Medical: 223 Surgical: 66	Medical: 200 Surgical: 100	Medical: 286 Surgical: 125		
Mean ± SD	Medical: 19.1 ± 17.3 Surgical: 15.6 ± 12.6	Medical: 21.7 ± 14.7 Surgical: 17.0 ± 14.6	Medical: 22.5 ± 21.4 Surgical: 18.9 ± 13.2	Medical: 16.8 ± 14.8 Surgical: 15.4 ± 13.9	Medical: 17.0 ± 15.8 Surgical: 13.6 ± 10.3		
Median (IQR)	Medical: 15 (8–25) Surgical: 12 (7–21)	Medical: 18 (10–31) Surgical: 13 (9–21)	Medical: 17 (9–30) Surgical: 14.5 (9–24)	Medical: 13 (7–20) Surgical: 11.5 (6.5–20.5)	Medical: 14 (7–21) Surgical: 10 (6–17)		
Time from ICU admission to ethics consultation (days)						0.0002	0.030
Mean ± SD	Medical: 18.4 ± 14.9 Surgical: 12.7 ± 12.1	Medical: 18.4 ± 14.9 Surgical: 12.7 ± 12.1	Medical: 17.6 ± 18.4 Surgical: 14.4 ± 11.2	Medical: 14.6 ± 16.3 Surgical: 12.1 ± 13.2	Medical: 14.6 ± 13.6 Surgical: 11.3 ± 11.3		
Median (IQR)	Medical: 15 (7–24) Surgical: 9 (6–14)	Medical: 15 (7–24) Surgical: 9 (6–14)	Medical: 13 (7–23) Surgical: 12 (6–19)	Medical: 9 (5–18) Surgical: 7 (4–15)	Medical: 10 (6–20) Surgical: 7 (4–14)		
Time from ethics consultation to withdrawal of life-sustaining treatment (days)						0.0004	0.056 (not significant)
Mean ± SD	Medical: 2.6 ± 4.1 Surgical: 2.7 ± 4.0	Medical: 4.6 ± 5.9 Surgical: 2.9 ± 4.0	Medical: 2.6 ± 4.3 Surgical: 3.7 ± 5.8	Medical: 2.2 ± 2.8 Surgical: 2.8 ± 3.8	Medical: 2.3 ± 3.8 Surgical: 2.0 ± 2.7		
Median (IQR)	Medical: 1 (0–3) Surgical: 1 (0–3)	Medical: 2 (1–6) Surgical: 1.5 (1–4)	Medical: 1 (0–3) Surgical: 2 (0–5)	Medical: 1 (0–3) Surgical: 1 (1–4)	Medical: 1 (0–3) Surgical: 1 (0–3)		

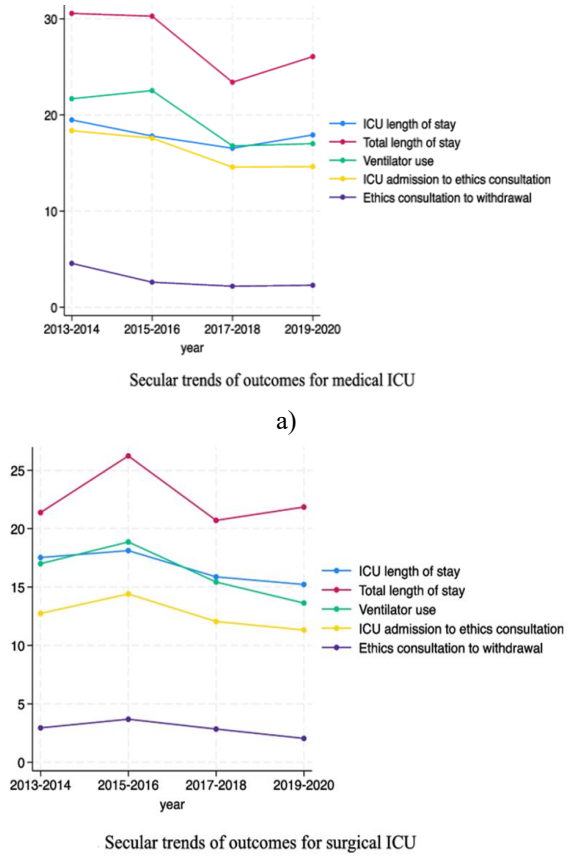

Figure 1. Secular trends of outcomes for medical and surgical ICU

Across the entire study period (2013–2020), patients in the medical ICU consistently had longer total hospital stays, more days on mechanical ventilation, and a greater delay from ICU admission to ethics consultation compared with surgical ICU patients. These differences reached statistical significance. In the earliest biennial period (2013–2014), total hospital stay was markedly longer in the medical ICU. Additionally, both ventilator duration and the time from admission to ethics consultation were significantly prolonged in the medical ICU during 2013–2014 and again in 2019–2020.

ICU LOS was notably longer in the medical ICU among patients who were ≥68 years old, married, had not suffered cardiac arrest, or had a Glasgow Coma Scale (GCS) score ≤4. Total hospital LOS was significantly extended in the medical ICU for patients who were ≥68 years old, of either sex, married, did not have advanced cancer, had no cardiac arrest, did not require vasopressors/inotropes, or had GCS ≤4.

Duration of mechanical ventilation was longer in the medical ICU for patients who were ≥68 years old, male, married, without advanced malignancy, without cardiac arrest, without vasopressor/inotrope support, or with GCS ≤4.

Results from multivariable linear regression analyses for ICU LOS, total hospital LOS, and ventilator days are displayed in **Table 3**. These models highlight distinct factors driving resource use in each ICU type after mandatory ethics consultation:

In the medical ICU, the presence of advanced cancer or a cardiac arrest episode was independently associated with shorter ICU stays and fewer ventilator days, likely reflecting higher illness severity and faster recognition of futility. In the surgical ICU, the strongest predictor was GCS score: lower consciousness levels (more severe neurological impairment) correlated with shorter ICU stays and reduced ventilator time, probably because profoundly poor neurological prognosis prompted earlier decisions to withdraw life-sustaining treatment. Together, these results show how different clinical characteristics influence the effect of required ethics consultations on resource utilization, with severity-of-illness markers driving earlier treatment limitation in each ICU setting.

Table 3. Multiple linear regression model for intensive care unit length of stay, total length of stay, and ventilator use

Predictor	ICU Length of Stay (days)		Total Hospital Length of Stay (days)		Days on Mechanical Ventilation	
	Medical ICU	Surgical ICU	Medical ICU	Surgical ICU	Medical ICU	Surgical ICU
	Coefficient (95% CI)	Coefficient (95% CI)	Coefficient (95% CI)	Coefficient (95% CI)	Coefficient (95% CI)	Coefficient (95% CI)
Age (per additional year)	−0.004 (−0.065 to 0.058)	−0.033 (−0.119 to 0.053)	−0.092 (−0.193 to 0.008)	−0.089 (−0.211 to 0.032)	−0.014 (−0.095 to 0.067)	−0.066 (−0.155 to 0.023)

Female (vs male)	−0.650 (−2.492 to 1.191)	−1.615 (−4.343 to 1.112)	−0.270 (−3.304 to 2.763)	−1.986 (−5.859 to 1.886)	−0.595 (−3.040 to 1.850)	−0.608 (−3.428 to 2.212)
Married (vs unmarried/other)	1.120 (−0.779 to 3.019)	−1.605 (−4.329 to 1.119)	1.192 (−1.937 to 4.321)	−3.347 (−7.215 to 0.520)	2.430 (−0.091 to 4.952)	−1.243 (−4.065 to 1.578)
Advanced cancer (vs no advanced cancer)	−2.508* (−4.492 to −0.523)	−2.909 (−6.061 to 0.243)	−2.747 (−6.016 to 0.523)	0.906 (−3.569 to 5.381)	−3.057* (−5.693 to −0.422)	−2.640 (−5.898 to 4.595)
Cardiac arrest (vs no cardiac arrest)	−4.040*** (−6.051 to −2.029)	−1.061 (−6.156 to 4.034)	−9.965*** (−13.279 to −6.651)	−0.864 (−8.098 to 6.370)	−4.098** (−6.752 to −1.444)	−0.652 (−5.898 to 4.595)
Inotropes/vasopressors (vs none)	−1.205 (−3.137 to 0.728)	0.237 (−3.147 to 3.621)	−2.181 (−5.365 to 1.003)	−1.417 (−6.221 to 3.387)	−2.490 (−5.044 to 0.065)	−0.500 (−3.985 to 2.985)
Glasgow Coma Scale score (per 1-point increase)	0.251 (−0.125 to 0.627)	0.990** (0.357 to 1.622)	0.818* (0.199 to 1.437)	2.145*** (1.247 to 3.043)	0.310 (−0.208 to 0.828)	1.210*** (0.530 to 1.890)
Constant	19.373*** (14.222 to 24.523)	17.533*** (10.602 to 24.465)	33.622*** (25.137 to 42.108)	22.647*** (12.806 to 32.488)	20.827*** (14.015 to 27.640)	16.439*** (9.301 to 23.578)
R^2	0.035	0.046	0.071	0.088	0.030	0.048

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$
[a]Sample size of regression model = 1150
[b]Sample size of regression model = 1137

Table 4 presents trends over time and compares the occurrence of ethical conflicts between medical and surgical ICUs. In the medical ICU, the frequency of conflicts related to care of terminally ill patients declined significantly every two years, dropping from twenty-five point two percent during two thousand thirteen to two thousand fourteen to eleven point eight percent in two thousand nineteen to two thousand twenty. In the surgical ICU, conflicts regarding the determination of terminally ill status also decreased biannually, from thirty-two point four percent in two thousand thirteen to two thousand fourteen to twelve point six percent in two thousand nineteen to two thousand twenty, although this decline did not reach statistical significance.

Disagreements between family members and the clinical team showed a significant biannual decrease in the medical ICU, falling from forty-six point six percent in two thousand thirteen to two thousand fourteen to twenty-nine point eight percent in two thousand nineteen to two thousand twenty. In the surgical ICU, these conflicts also declined from sixty-one point eight percent to forty-one point seven percent over the same period. Conflicts among members of the clinical team themselves decreased significantly in the surgical ICU, from twenty-six point five percent in two thousand thirteen to two thousand fourteen to ten point two percent in two thousand nineteen to two thousand twenty.

Table 4. Summarizes these secular trends and provides a comparative overview of the incidence of ethical conflicts in medical versus surgical intensive care units.

Reason for consultation	**All years combined**	**2013–2014**	**2015–2016**	**2017–2018**	**2019–2020**	**p-value for trend Medical**	**p-value for trend Surgical**
	Medical n (%)	Surgical n (%)	Medical n (%)	Surgical n (%)	Medical n (%)	Surgical n (%)	Medical n (%)
Difficulty determining terminally ill condition	90 (10.9%)	47 (14.3%)	26 (25.2%)	11 (32.4%)	12 (5.3%)	5 (7.6%)	18 (8.8%)
Any conflict between family members	427 (51.9%)	183 (55.8%)	61 (59.2%)	16 (47.1%)	117 (51.8%)	34 (51.5%)	89 (43.6%)

Conflict between family members and clinical team	331 (40.3%)	161 (49.1%)	48 (46.6%)	21 (61.8%)	109 (48.2%)	34 (51.5%)	88 (43.1%)
Conflict among members of the clinical team	87 (10.6%)	53 (16.2%)	15 (14.6%)	9 (26.5%)	27 (12.0%)	10 (15.2%)	20 (9.8%)

Over the entire study period, both kinds of disputes (between patients' families and staff, and among staff themselves) happened a lot more often in the surgical intensive care unit than in the medical one. The gap was especially clear in certain years: family-staff clashes were noticeably more common in surgical ICU patients during 2019–2020, while arguments among the care team itself peaked in the surgical unit back in 2013–2014. After that early peak, disagreements among surgical ICU staff fell sharply and ended up looking about the same as in the medical ICU.

When the issue was deciding whether a patient was terminally ill, this kind of disagreement was far more frequent in the surgical ICU, but only among patients aged 68 or older. Family-versus-staff tension was significantly higher in the surgical ICU for men, single patients, people with late-stage cancer, those not on blood-pressure-supporting drugs, and patients who were deeply unconscious (GCS ≤ 4). On the other hand, fights within the care team were more common in the surgical ICU when patients were younger than 68, male, unmarried, had advanced cancer, weren't on pressors, or had a GCS above 4.

After adjusting for a range of patient and clinical factors in multivariate models (**Table 5**), the predictors looked different between the two units: Disputes about declaring someone terminally ill were driven mainly by consciousness level (higher GCS) in the medical ICU, and by both consciousness level and not being on pressors in the surgical ICU. Family-staff conflicts in the medical ICU were influenced by age, late-stage cancer, pressor use, and GCS; in the surgical ICU, only marital status stood out as a clear driver. Staff-versus-staff conflicts in the medical ICU were tied to age, advanced cancer, and GCS, whereas in the surgical ICU they were mainly linked to whether the patient was married and their level of consciousness. In short, the surgical ICU consistently had more conflict overall, but the reasons behind each type of disagreement varied considerably depending on whether the patient was in a medical or surgical unit.

Table 5. Multivariable logistic regression models of incidence rate of ethical contexts

Predictor	**Conflicts about determining terminal illness**	**Family-only conflicts***	**Family vs. clinical team conflicts**	**Intra-team (clinical team member) conflicts**
	Medical ICU	Surgical ICU	Medical ICU	Surgical ICU
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Age (per year)	0.988 (0.974–1.003)	1.011 (0.990–1.032)	0.986** (0.977–0.996)	0.996 (0.981–1.011)
Female gender (ref = male)	0.964 (0.609–1.528)	0.658 (0.331–1.309)	0.739* (0.553–0.988)	0.871 (0.548–1.385)
Currently married (ref = unmarried/other)	0.832 (0.523–1.323)	0.652 (0.342–1.245)	0.717* (0.531–0.967)	0.449*** (0.280–0.719)
Advanced/metastatic cancer (ref = no)	0.739 (0.444–1.231)	0.985 (0.465–2.086)	0.632** (0.461–0.865)	0.939 (0.548–1.611)
Cardiac arrest (ref = no cardiac arrest)	0.981 (0.581–1.656)	0.396 (0.050–3.122)	0.908 (0.662–1.245)	0.988 (0.420–2.325)
Receiving inotropes/vasopressors (ref = no)	0.782 (0.470–1.301)	0.280* (0.083–0.951)	1.040 (0.767–1.411)	0.866 (0.488–1.536)
GCS score (per 1-point increase)	1.157*** (1.064–1.258)	1.172* (1.027–1.338)	1.136*** (1.069–1.208)	1.139* (1.014–1.279)

Constant	0.166** (0.049–0.561)	0.101** (0.019–0.548)	3.192** (1.399–7.284)	1.848 (0.554–6.163)
Model likelihood-ratio test	$\chi^2 = 18.02$; $p = 0.012$	$\chi^2 = 20.30$; $p = 0.005$	$\chi^2 = 43.92$; $p < 0.0001$	$\chi^2 = 18.52$; $p = 0.0098$

The survey revealed overwhelmingly positive responses across all ten questions. Median scores were at the maximum value of five for both groups, demonstrating strong agreement that the consultation process was beneficial. Mean scores ranged from four point five two to four point eight four, reflecting consistently favorable impressions of the support provided. Family members highlighted their satisfaction with the clinical care team, the assistance offered by the CEC team, and their belief that CEC should be a standard component of end-of-life care discussions.

One item—focused on concerns about patient discomfort during withdrawal of life-sustaining interventions—received slightly lower scores than others, though still within the positive range. This may indicate that families continued to have some concerns about the emotional and physical aspects of end-of-life care, even when CEC was involved. Notably, no significant differences emerged between responses from medical and surgical ICU families, suggesting that the perceived value of CEC was consistent across both settings. These results highlight the crucial role of mandatory CEC in fostering trust, offering emotional guidance, and facilitating shared decision-making for families facing ethically complex situations at the end of life.

This study investigated the effects of a mandatory clinical ethics consultation (CEC) policy in medical and surgical ICUs, focusing on resource utilization, ethical conflicts, predictive factors, and family satisfaction. Over the course of the study, both resource use and rates of ethical conflicts showed a biannual decline in both ICU types. Notably, the surgical ICU used fewer resources but experienced a higher frequency of ethical conflicts than the medical ICU. Subgroup analyses further highlighted differences in patient characteristics, while predictive factors for resource use and ethical conflict incidence were identified. To our knowledge, this represents the first longitudinal study to systematically examine the effects of a mandatory CEC policy on both clinical and ethical outcomes across medical and surgical ICUs.

Following the introduction of mandatory CEC, both resource utilization and ethical conflict rates decreased steadily in medical and surgical ICUs. We attribute these improvements to the structured CEC framework and our consultation model. The multidisciplinary CEC team included specialists in clinical ethics, hospice and palliative care, social work, and clinical psychology. By integrating CEC into routine practice, healthcare providers' awareness of available ethics support increased [11]. The consultation process facilitates communication among stakeholders, helps reconcile differing perspectives, and supports consensus-building. Case-based discussions between the CEC and clinical teams also served an educational purpose, increasing clinicians' ethical awareness and promoting collaborative problem-solving. Early involvement of the CEC team, before conflicts emerge, reduces individual biases, enhances family-provider communication, resolves ethical concerns, and improves the overall quality of end-of-life care.

Experience gained by both the CEC and clinical teams appears to influence decision-making and outcomes in end-of-life care. Prior studies have documented a volume–outcome relationship in critical care [32] and trauma settings [33], demonstrating improved outcomes in high-volume hospitals. Clinicians who frequently care for critically ill or trauma patients develop greater expertise in guiding families through end-of-life decisions [34]. After implementation of mandatory CEC, consultation frequency increased, and combined with rising patient volumes, the teams gained substantial experience in patient assessment and family communication, likely contributing to improved patient outcomes.

Earlier research has suggested that surgical patients requiring ethics consultation may experience longer ICU stays, potentially due to the close personal connection between surgeons and their patients. Surgeons may perceive intraoperative complications or adverse outcomes as personal failures and adhere to a "covenantal ethic," striving to combat death on behalf of their patients [23, 35]. Contrary to this, our findings showed that LOS in the surgical ICU was significantly shorter than in the medical ICU. Several explanations may account for this observation. In our institution, surgical intensivists, rather than the operating surgeons, take primary responsibility for patients in the surgical ICU. These intensivists apply ethical principles such as beneficence,

non-maleficence, respect for patient autonomy, and equitable allocation of resources [23], allowing more objective decision-making in end-of-life scenarios. Additionally, the surgical ICU population included more patients with neurological conditions, who are known to have shorter ICU stays and earlier withdrawal of mechanical ventilation compared with medical ICU patients [36]. In contrast, the medical ICU generally cares for patients with chronic, multi-system illnesses requiring prolonged management, which likely contributes to longer LOS.

At the start of the study, conflict rates between family members and the clinical team, as well as among clinical team members, were high—particularly in the surgical ICU. Families perceiving inappropriate care reported decreased trust and satisfaction with ICU staff [35]. Previous studies suggest that surgical specialties rarely request ethics consultations for intra-team conflicts despite frequent encounters [22]. This may reflect cultural norms discouraging CEC use within surgery. After implementing the mandatory CEC policy, however, conflict rates declined in both ICU types, eventually reaching similar levels. Institutional policies and educational programs that encourage consultation can reduce ethical conflicts and enhance the quality of ICU care.

The Glasgow Coma Scale (GCS) emerged as a significant predictor of LOS, ventilator days, and ethical conflict incidence. Patients with persistently low GCS scores, reflecting severe consciousness impairment, were associated with shorter LOS, fewer ventilator days, and reduced ethical conflicts. This aligns with prior research indicating that poor neurological prognosis prompts earlier discussions about withdrawal of life-sustaining treatment [37]. Clear prognostic indicators allow healthcare providers and families to reach decisions more quickly, shortening intensive interventions and easing ethical decision-making.

Creating an ethical environment and fostering trust are critical for high-quality care [38-41]. The observed reductions in LOS, resource utilization, and ethical conflicts suggest that our CEC model and mandatory policy were effective. Mandatory CEC can minimize individual clinician bias, establish care standards, and support clinical teams [11]. Education and training are also essential for developing provider competencies in ethical and end-of-life care. Surgical ICU staff may be more susceptible to moral distress due to limited engagement in structured support programs [42], and junior surgical clinicians may require targeted training in end-of-life communication [43]. Postgraduate programs and specialty-specific education are recommended to build skills in patient-centered, compassionate care [44]. Continuous professional development is critical to respecting patient dignity, promoting ethical decision-making, and enhancing the quality of ICU care [17, 45, 46]. Our institution implemented substantial training programs before and after CEC policy initiation to improve end-of-life care quality across all ICU staff.

This study makes several important contributions. It is the first to evaluate the longitudinal effects of a mandatory CEC policy in medical and surgical ICUs. Additionally, it identifies factors that can inform future educational and training programs for different specialties in end-of-life care.

Limitations include its single-center design, focusing exclusively on patients undergoing withdrawal of life-sustaining treatment, which may limit generalizability. Ethical conflicts may vary in different cultural contexts, necessitating further research. While findings are promising, well-designed cluster randomized trials are needed to establish causality. Future studies should also assess the impact of specialty-specific education and training on healthcare provider competencies and patient-centered outcomes.

Conclusion

The introduction of mandatory clinical ethics consultation (CEC) affected the medical and surgical ICUs in distinct ways, particularly with respect to resource consumption and the frequency of ethical disputes. Following the policy rollout, both units saw reductions in overall resource utilization and ethical conflicts.

Compared to the medical ICU, the surgical ICU recorded markedly shorter total lengths of stay and fewer days on mechanical ventilation. This difference is probably explained by the more predictable treatment trajectories and well-defined surgical goals in the surgical setting.

Despite these efficiencies, the surgical ICU continued to experience a substantially higher rate of ethical conflicts than the medical ICU. This may stem from the intense emotional bonds that often form between surgeons and patients (or families), combined with the abrupt and sometimes unexpected shift from curative surgery to palliative or end-of-life care when complications arise.

The factors that drove resource use and conflict also differed noticeably between the two units. Taken together, these findings give ethics consultants and bedside teams valuable insight into the specialty-specific challenges they are likely to encounter.

The hospital should therefore consider creating tailored training and education initiatives for each discipline to optimize the quality of end-of-life decision-making and care across all intensive care settings.

Acknowledgments: We thank Editage for editing the draft of this manuscript.

Conflict of Interest: None

Financial Support: This project was supported by the Ministry of Science and Technology under Grant MOST 113–2410-H-037–013-MY2 and Kaohsiung Medical University Hospital under Grant KMUH109-9R31.

Ethics Statement: The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board (IRB) of Kaohsiung Medical University Hospital before the study began. The IRB number is KMUH-IRB-20130379. The ClinicalTrials.gov Identifier is NCT04926610. Informed consent was obtained from all subjects participated in the interview of the study, while consent was waived for the data collected retrospectively.

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