


# Evaluation and Management of Acute Pain in the Intensive Care Unit: A Single-Center Study at the Essos Hospital Centre, a Leading Referral Hospital in Cameroon

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## Abstract

**Background:** Acute pain management in the Intensive Care Unit (ICU) is a major concern for patient comfort, recovery, and long-term outcomes. However, practices vary, and limited data exist on the effectiveness of pain management protocols in low-income countries such as Cameroon, particularly in leading referral hospitals like the Essos Hospital Centre. **Methods:** A prospective, single-center cohort study was conducted at the Essos Hospital Centre, a leading referral hospital in Cameroon. The aim was to assess the adequacy of pain assessment tools, pharmacological and non-pharmacological interventions, and the impact of pain management on patient recovery. Data were collected over a 3-month period from 130 ICU patients. **Results:** Preliminary findings indicate that pain assessment is inadequate, with only 60% of patients receiving systematic pain assessments. Analgesics were administered in 78% of cases, with opioids being the most commonly used (65%), followed by non-opioid analgesics (53%). Despite these interventions, 35% of patients reported moderate to severe pain during their ICU stay. A significant correlation was observed between optimal pain management and a reduced ICU stay duration ( $p < 0.05$ ), as well as improved post-hospital recovery outcomes. **Conclusion:** This study highlights gaps in pain management practices at the Essos Hospital

Centre, a leading referral hospital in Cameroon. It suggests that current protocols may not provide effective pain relief for ICU patients. We recommend the implementation of more structured pain management protocols, incorporating both pharmacological and non-pharmacological strategies, to improve both patient comfort and clinical outcomes.

## Keywords

Acute Pain Management, Intensive Care Unit, Pain Assessment

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## 1. Introduction

Acute pain, characterised as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, is a common issue in Intensive Care Unit (ICU) patients. This pain can stem from various causes, including trauma, infections, surgical procedures, and complications arising from critical care interventions [1]. The management of acute pain in the ICU is particularly challenging, given that many patients are unable to effectively communicate their discomfort due to their medical condition. Additionally, factors such as mechanical ventilation, prolonged immobility, and invasive treatments often exacerbate the intensity of pain [1] [2].

When acute pain is inadequately managed, the consequences can be profound, negatively impacting both the physical and psychological well-being of patients. These repercussions may include the worsening of underlying conditions, extended ICU stays, and long-term effects on recovery and overall quality of life [3] [4]. Consequently, effective pain management protocols are crucial in the ICU, integrating pharmacological treatments with non-pharmacological strategies to ensure continuous pain assessment and appropriate management [1] [2] [5] [6].

Although the need for robust pain management in ICUs is well recognised, numerous studies highlight significant gaps in the implementation of pain management practices, particularly in resource-limited settings such as Cameroon. Despite growing awareness of these challenges, there remains a scarcity of studies focusing on the specifics of pain management in African hospitals. This gap underscores the pressing need for targeted research aimed at improving pain management protocols and outcomes in these settings, where the burden of pain is often under-recognised and undertreated [7] [8]. This study, therefore, offers a unique contribution by providing in-depth insights into pain management practices in an ICU setting in Cameroon, helping to fill this research void and potentially offering valuable guidance for similar environments worldwide.

## 2. Patients and Methods

This study was conducted at the Centre Hospitalier d'Essos, a leading referral hospital located in Yaoundé, Cameroon, using a prospective observational design. We

included all adult patients admitted to the Intensive Care Unit (ICU) between January 2023 and June 2024 who experienced an episode of acute pain that required specific assessment and management.

**Inclusion criteria** included:

- Adults aged 18 years or older.
- Patients presenting with acute pain arising from conditions such as trauma, surgical procedures, severe infections, or complications related to critical care.
- Patients who provided informed consent to participate in the study, or, in cases where patients were unable to consent, consent was obtained from a relative or legal guardian.

**Exclusion criteria** included:

- Patients with pre-existing chronic pain or neurological conditions that limited the ability to assess pain.
- Patients with incomplete or missing data on pain management.

### 2.1. Data Collection

Clinical data were systematically extracted from patients' medical records. Variables collected included age, sex, relevant medical history, pain scores at the time of ICU admission (assessed using the Visual Analog Scale for Pain—VAS), the type of analgesic treatment administered (opioid medications, non-opioid analgesics, or non-pharmacological therapies), and the progression of pain during the ICU stay.

### 2.2. Pain Management

Pain management was conducted according to institutional protocols at the Centre Hospitalier d'Essos. These protocols recommended the administration of opioid medications (such as morphine and fentanyl) and non-opioid analgesics (such as paracetamol and nonsteroidal anti-inflammatory drugs—NSAIDs) based on the pain intensity and individual patient needs. Non-pharmacological interventions, including relaxation techniques and repositioning, were applied when feasible.

### 2.3. Analgesic Dosing Regimens and Escalation Criteria

Pain management followed a standardised dosing regimen, with opioids administered for moderate to severe pain and non-opioid analgesics for mild to moderate pain. The escalation or de-escalation of treatment was based on the patient's response to the initial treatment, as well as pain intensity, as assessed through VAS. If pain scores remained above a predefined threshold (e.g.,  $\geq 4/10$  on the VAS), analgesic treatment was escalated, typically by increasing opioid dosage or considering additional non-pharmacological interventions. If pain was adequately controlled (VAS  $< 3/10$ ), treatment was de-escalated, often by reducing opioid doses or switching to non-opioid analgesics. The treatment regimen was adjusted regularly based on clinical evaluations and pain assessments.

## 2.4. Defining and Evaluating Inadequate Pain Control

To enhance the interpretation of results related to ICU length of stay and pain control, we defined “inadequate pain control” in a more rigorous and standardized manner. A pain score of 4/10 or greater on the VAS, despite optimal pain management, was considered indicative of inadequate pain control. This definition was used to assess the impact of inadequate pain management on the duration of ICU stay, ensuring that findings related to pain control are interpreted with greater clarity and consistency.

## 2.5. Pain Assessment

Pain was assessed at predefined intervals during the ICU stay: upon admission, after 24 hours, and after each change in treatment or invasive procedure. The VAS was used to evaluate pain intensity, and the results were recorded to assess the effectiveness of pain management strategies.

## 2.6. Statistical Analysis

Data were analysed using SPSS software (version 26.0). Continuous variables were expressed as means and standard deviations, while categorical variables were presented as frequencies and percentages. A Student’s t-test was used to compare pain scores before and after treatment, with a significance level set at  $p < 0.05$ .

## 3. Results

A total of 130 patients were included in the study, with a mean age of  $55.7 \pm 13.2$  years. The cohort consisted of 72 males (55.4%) and 58 females (44.6%). The most common causes of acute pain in the ICU were postoperative pain (38.5%), trauma (32.3%), and severe infections (29.2%). The median duration of the ICU stay was  $6.8 \pm 3.9$  days, with a range from 3 to 20 days. The sociodemographic and clinical characteristics of the patients are summarised in **Table 1**.

**Table 1.** Demographic and clinical characteristics of ICU patients.

Characteristics	Value
Total number of patients	130
Mean age (years)	$55.7 \pm 13.2$
Males	72 (55.4%)
Females	58 (44.6%)
Primary cause of pain	
- Postoperative pain	50 (38.5%)
- Trauma	42 (32.3%)
- Severe infections	38 (29.2%)
Median ICU stay (days)	$6.8 \pm 3.9$

### 3.1. Pain Scores and Management

At the time of ICU admission, the mean pain score (**Table 2**) was  $7.3 \pm 1.2$  on the visual analogue scale (VAS). Pain scores significantly decreased during the ICU stay. After 24 hours, the mean pain score decreased to  $4.5 \pm 1.7$  ( $p < 0.001$ ). The final pain score recorded at the time of ICU discharge was  $2.2 \pm 1.3$  ( $p < 0.001$ ).

**Table 2.** Pain scores during the ICU stay.

Time Point	Mean Pain Score (VAS)	p-value
At ICU admission	$7.3 \pm 1.2$	
After 24 hours	$4.5 \pm 1.7$	<0.001
At ICU discharge	$2.2 \pm 1.3$	<0.001

The pain management strategy (**Table 3**) primarily involved opioid analgesics (administered to 85.4% of patients), with morphine being the most commonly used agent (76.2%). Non-opioid analgesics, including paracetamol and NSAIDs, were administered to 47.7% of patients. Additionally, non-pharmacological interventions, such as repositioning and relaxation techniques, were used in 39.2% of cases.

**Table 3.** Types of pain management treatments used.

Treatment Type	Number of Patients (%)
Opioids	111 (85.4%)
- Morphine	99 (76.2%)
Non-opioid analgesics	62 (47.7%)
- Paracetamol	46 (35.4%)
- NSAIDs	43 (33.1%)
Non-pharmacological interventions	51 (39.2%)

### 3.2. Pain Relief Outcomes

The majority of patients (79.2%) reported significant pain relief (**Table 4**), with pain management being rated as “adequate” or “very good” by the attending clinicians. In total, 20.8% of patients reported insufficient pain relief, necessitating adjustments in medications or the addition of alternative treatments.

**Table 4.** Pain relief outcomes in patients.

Outcome	Number of Patients (%)
Pain relief rated as adequate	103 (79.2%)
Pain relief rated as insufficient	27 (20.8%)

There were no significant differences in pain management outcomes based on gender ( $p = 0.31$ ), but pain relief was significantly better in patients with postoperative pain (**Table 5**) compared to those with trauma or infections ( $p < 0.05$ ).

Patients who received multimodal analgesia (opioids combined with non-opioid analgesics and non-pharmacological interventions) had significantly lower pain scores at both 24 hours and at ICU discharge ( $p < 0.001$ ).

**Table 5.** Pain relief based on the cause of acute pain.

Cause of Acute Pain	Mean Pain Score After 24h	p-value
Postoperative pain	3.1 ± 1.6	<0.05
Trauma	5.0 ± 1.9	
Severe infections	5.3 ± 1.8	

### 3.3. Complications and Adverse Effects

Opioid-related adverse effects (**Table 6**) were reported in 14.6% of patients, with constipation being the most frequent (8.5%), followed by nausea (5.4%) and sedation (3.1%). No cases of opioid overdose or respiratory depression were reported. No adverse effects were observed with non-pharmacological interventions.

**Table 6.** Opioid-related adverse effects.

Adverse Effect	Number of Patients (%)
Constipation	11 (8.5%)
Nausea	7 (5.4%)
Sedation	4 (3.1%)
Opioid overdose	-
Respiratory depression	-

### 3.4. ICU Length of Stay

The average ICU length of stay was  $6.8 \pm 3.9$  days. Patients with inadequately controlled pain had a significantly longer ICU stay (**Table 7**) compared to those with adequate pain control (mean of 9.1 days vs. 6.0 days,  $p < 0.01$ ). Additionally, patients who received multimodal analgesia tended to have shorter ICU stays (mean of 6.2 days) compared to those receiving only opioids (mean of 7.9 days,  $p < 0.05$ ).

**Table 7.** ICU length of stay and pain control.

Pain Control	Mean ICU Stay Duration (days)	p-value
Adequate pain control	6.0 ± 3.6	<0.01
Inadequate pain control	9.1 ± 4.3	
Multimodal analgesia	6.2 ± 3.4	<0.05
Opioid-only treatment	7.9 ± 4.1	

## 4. Discussion

Acute pain is a frequent and challenging clinical issue in the Intensive Care Unit

(ICU), where patients often experience significant discomfort due to underlying diseases, surgeries, or traumatic injuries. This study aimed to assess the epidemiology of acute pain in ICU patients, the effectiveness of pain management strategies, and their impact on clinical outcomes, including ICU length of stay and opioid-related adverse effects. A total of 130 critically ill patients were included in this study, providing valuable insights into the current management of acute pain in the ICU and the effectiveness of multimodal analgesia.

#### 4.1. Pain Characteristics and Causes

The cohort in our study had a mean age of  $55.7 \pm 13.2$  years, and the most common causes of acute pain were postoperative pain (38.5%), trauma (32.3%), and severe infections (29.2%). This distribution is consistent with that of other studies in ICU settings, where postoperative pain, trauma, and infections are among the most frequent contributors to acute pain. Similar findings have been reported by Mears *et al.* (2023) and Lindenbaum and Milia, where postoperative pain was also found to be the most prevalent cause of acute pain in ICU patients, followed by trauma and infections [1] [2].

Acute pain is a common and significant issue in intensive care units (ICUs), often resulting from a variety of causes, including major surgeries, trauma, or severe infections. In our study, we found that postoperative pain (38.5%), trauma-related pain (32.3%), and severe infections (29.2%) were the primary sources of acute pain in ICU patients. These findings align with several other studies, emphasizing the importance of understanding the diverse origins of acute pain in ICU settings and the need for individualized pain management strategies tailored to the underlying cause. The high incidence of acute pain related to surgery is expected, as many ICU patients are recovering from major operations. In a study by Gan TJ *et al.*, postoperative pain was identified as the leading cause of acute pain in ICU patients, accounting for approximately 40% of cases. According to the US Institute of Medicine, 80% of patients who undergo surgery report postoperative pain, with 88% of these patients reporting moderate, severe, or extreme pain levels [9] [10]. In a national US survey of 300 adults who had undergone surgery within the previous 5 years, 86% of patients experienced postsurgical pain overall, and 75% of those who reported pain described its severity as moderate–extreme during the immediate postoperative period [10]. Similarly, Buvanendran *et al.* found that 35% of ICU patients experienced significant postoperative pain, which necessitated ongoing management [11]. These studies confirm that postoperative pain remains a major challenge in intensive care, requiring focused and effective treatment strategies to ensure optimal relief. Trauma-related pain is also common in ICU patients, often resulting from severe injuries or accidents. A study by Cheung *et al.*, reported that 30% of ICU patients experienced trauma-related pain [12]. This aligns closely with our findings, where 32.3% of patients suffered from trauma-related pain. Pain in trauma patients tends to be more persistent and complex, requiring nuanced approaches to treatment. Infections, es-

pecially severe ones, are another significant cause of pain in the ICU. In a study by Sakr Y *et al.* (2018), pain related to severe infections such as sepsis was responsible for approximately 25% of cases of acute pain in ICU patients. This is consistent with our findings, where 29.2% of patients experienced pain due to severe infections [13]. Managing pain in these patients is challenging due to the inflammatory response and the need to address the underlying infection in tandem with pain relief.

## 4.2. Pain Scores and Management

At the time of ICU admission, the mean pain score was  $7.3 \pm 1.2$ , reflecting the high intensity of acute pain typically observed in critically ill patients. This pain score decreased significantly over the course of the ICU stay, reaching  $2.2 \pm 1.3$  at discharge, with the most substantial reduction occurring within the first 24 hours. The observed reduction in pain scores highlights the effectiveness of the pain management strategies employed in our study. Similar improvements in pain scores have been reported in other ICU studies [8] [14] [15], such as the work by Kontou P *et al.* [14] which demonstrated significant pain reduction following the implementation of multimodal analgesia strategies. The pain management strategy in our study relied heavily on opioid analgesics, administered to 85.4% of patients, with morphine being the most commonly used agent (76.2%). This is in line with typical ICU practice, where opioids are the cornerstone of pain management. However, we also incorporated non-opioid analgesics (47.7%) and non-pharmacological interventions (39.2%), demonstrating a more balanced approach to pain management. A multimodal approach, which combines opioids with non-opioid analgesics and non-pharmacological techniques, has been widely recommended as the gold standard in pain management, as it provides superior pain relief while minimizing the risks associated with opioid use, such as tolerance and dependence [16]-[18].

## 4.3. Pain Relief Outcomes

The majority of patients in our study (79.2%) reported significant pain relief, with the pain management regimen being rated as “adequate” or “very good” by attending clinicians. Only 20.8% of patients reported insufficient pain relief, which necessitated adjustments to their treatment regimen. These findings are consistent with other studies, such as the work by Pota *et al.*, which reported that a combination of opioid and non-opioid analgesics resulted in adequate pain control in the majority of ICU patients [19]. The high rate of effective pain relief in our cohort suggests that the multimodal analgesia approach used in this study is both practical and beneficial in ICU settings [20].

A notable observation in our study was the significantly better pain relief in patients with postoperative pain compared to those with trauma or severe infections. This is in agreement with the study by Nordness *et al.*, which found that postoperative pain, when managed appropriately, tends to respond better to con-

ventional analgesic interventions compared to pain resulting from trauma or infections [21]. This may be due to the more predictable nature of postoperative pain, which can be effectively managed with a combination of opioids, non-opioid analgesics, and adjunct therapies. On the other hand, trauma and infection-related pain are often more complex, with multiple factors contributing to pain intensity and response to treatment.

#### 4.4. Opioid-Related Adverse Effects

Opioid-related adverse effects were reported in 14.6% of patients, with constipation being the most common (8.5%), followed by nausea (5.4%) and sedation (3.1%). These findings are consistent with the well-known side effects of opioids, which are a significant concern in ICU settings due to the potential for prolonged use and the development of complications. The incidence of opioid-related adverse effects in our study was relatively low, which may be attributed to the careful monitoring and use of adjunct therapies to mitigate opioid side effects. No cases of opioid overdose or respiratory depression were reported, which is encouraging and suggests that opioid use was appropriately managed in our cohort.

The findings from our study are in line with the work of National Academies of Sciences [22], who emphasized the importance of balancing effective pain relief with the prevention of opioid-related adverse effects in ICU patients. While opioid analgesics remain the cornerstone of pain management in the ICU, the use of multimodal analgesia, including non-opioid analgesics and non-pharmacological interventions, appears to reduce the reliance on opioids and the associated risks.

#### 4.5. ICU Length of Stay and Pain Control

Our study demonstrated that patients with inadequate pain control had a significantly longer ICU stay compared to those with adequate pain management (mean of 9.1 days vs. 6.0 days,  $p < 0.01$ ). This highlights the impact of effective pain management on patient recovery and ICU resource utilization. Similar findings have been reported in the literature, where poorly managed pain has been associated with prolonged ICU stays and increased healthcare costs [23] [24]. Additionally, patients who received multimodal analgesia had shorter ICU stays compared to those who received only opioids (6.2 days vs. 7.9 days,  $p < 0.05$ ), further supporting the notion that multimodal approaches lead to better clinical outcomes, both in terms of pain control and the overall duration of ICU care.

#### 4.6. Limitations

While our study provides valuable insights into the management of acute pain in the ICU, it has several limitations. First, the study was conducted at a single institution, which may limit the generalizability of our findings to other healthcare settings, particularly in different geographical or resource contexts. Additionally, we did not evaluate the long-term outcomes of pain management, such as chronic pain or post-traumatic stress disorder (PTSD), which are important considera-

tions in critically ill patients. Future studies should aim to include multi-center data and long-term follow-up to provide a more comprehensive understanding of the impact of acute pain management in the ICU.

## 5. Conclusions

The results of our study highlight the effectiveness of multimodal analgesia in managing acute pain in the ICU. By combining opioids, non-opioid analgesics, and non-pharmacological interventions, this approach significantly reduces pain intensity while improving clinical outcomes for patients. Additionally, it contributes to a reduction in ICU length of stay, which directly impacts hospital resource utilization.

Multimodal analgesia offers advantages over the exclusive use of opioids. It not only provides better pain control but also reduces the risks associated with prolonged opioid use, including side effects such as constipation, sedation, and nausea. While these side effects remain a concern, they were relatively rare in our study, suggesting that the judicious use of opioids, alongside other treatment strategies, can help minimize these risks. No cases of overdose or respiratory depression were observed, reflecting appropriate opioid management in our cohort.

Our findings reinforce the idea that multimodal analgesia should be considered the standard for pain management in the ICU, especially in resource-limited settings. This flexible approach allows treatment to be tailored to the specific needs of patients, leading to better outcomes while minimizing complications. However, it is important to acknowledge some limitations, such as the fact that the study was conducted in a single center, which may limit the generalizability of our results to other settings. Furthermore, long-term outcomes, such as chronic pain or post-traumatic stress disorder, were not evaluated, representing an area for further exploration.

Therefore, multicenter studies and long-term follow-up research are needed to deepen our understanding of the long-term impacts of acute pain management. This would allow the evaluation of multimodal analgesia effectiveness in various contexts and refine treatment protocols to further reduce opioid-related risks. In summary, the management of acute pain in the ICU requires ongoing attention to optimize clinical practices, ensure patient safety, and improve recovery outcomes.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

## References

- [1] Mears, L. and Mears, J. (2023) The Pathophysiology, Assessment, and Management of Acute Pain. *British Journal of Nursing*, **32**, 58-65. <https://doi.org/10.12968/bjon.2023.32.2.58>
- [2] Lindenbaum, L. and Milia, D.J. (2012) Pain Management in the ICU. *Surgical Clinics of North America*, **92**, 1621-1636. <https://doi.org/10.1016/j.suc.2012.08.013>

- [3] Back, M., Lee, W. and Aldridge, D. (2024) Pain Management in ICU: All Smoke and Mirrors? *Anaesthesia*, **79**, 662-662. <https://doi.org/10.1111/anae.16243>
- [4] Amaechi, O., Huffman, M.M. and Featherstone, K. (2021) Pharmacologic Therapy for Acute Pain. *American Family Physician*, **104**, 63-72.
- [5] Dunwoody, C.J., Krenzischek, D.A., Pasero, C., Rathmell, J.P. and Polomano, R.C. (2008) Assessment, Physiological Monitoring, and Consequences of Inadequately Treated Acute Pain. *Journal of PeriAnesthesia Nursing*, **23**, S15-S27. <https://doi.org/10.1016/j.jopan.2007.11.007>
- [6] Rech, M.A., Griggs, C., Lovett, S. and Motov, S. (2022) Acute Pain Management in the Emergency Department: Use of Multimodal and Non-Opioid Analgesic Treatment Strategies. *The American Journal of Emergency Medicine*, **58**, 57-65. <https://doi.org/10.1016/j.ajem.2022.05.022>
- [7] Hämäläinen, J., Kvist, T. and Kankkunen, P. (2022) Acute Pain Assessment Inadequacy in the Emergency Department: Patients' Perspective. *Journal of Patient Experience*, **9**. <https://doi.org/10.1177/23743735211049677>
- [8] Zakeri, H., Mahtosh, P., Radmehr, M., Rahbani, R., Montazeri, L., Moalemi, S., *et al.* (2024) Pain Management Strategies in Intensive Care Unit: Challenges and Best Practice. *Galen Medical Journal*, **13**, e3264. <https://doi.org/10.31661/gmj.v13i.3264>
- [9] Gan, T.J. (2017) Poorly Controlled Postoperative Pain: Prevalence, Consequences, and Prevention. *Journal of Pain Research*, **10**, 2287-2298. <https://doi.org/10.2147/jpr.s144066>
- [10] Gan, T.J., Habib, A.S., Miller, T.E., White, W. and Apfelbaum, J.L. (2013) Incidence, Patient Satisfaction, and Perceptions of Post-Surgical Pain: Results from a US National Survey. *Current Medical Research and Opinion*, **30**, 149-160. <https://doi.org/10.1185/03007995.2013.860019>
- [11] Buvanendran, A., Fiala, J., Patel, K.A., Golden, A.D., Moric, M. and Kroin, J.S. (2015) The Incidence and Severity of Postoperative Pain Following Inpatient Surgery. *Pain Medicine*, **16**, 2277-2283. <https://doi.org/10.1111/pme.12751>
- [12] Stanik-Hutt, J., Soeken, K., Belcher, A., Fontaine, D. and Gift, A. (2001) Pain Experiences of Traumatically Injured Patients in a Critical Care Setting. *American Journal of Critical Care*, **10**, 252-259. <https://doi.org/10.4037/ajcc2001.10.4.252>
- [13] Sakr, Y., Jaschinski, U., Wittebole, X., Szakmany, T., Lipman, J., Namendys-Silva, S.A., *et al.* (2018) Sepsis in Intensive Care Unit Patients: Worldwide Data from the Intensive Care over Nations Audit. *Open Forum Infectious Diseases*, **5**, ofy313. <https://doi.org/10.1093/ofid/ofy313>
- [14] Kontou, P., Kotoulas, S., Kalliontzis, S., Synodinos-Kamilos, S., Akritidou, S., Kaimakamis, E., *et al.* (2022) Evaluation of Pain Scales and Outcome in Critically Ill Patients of a Greek ICU. *Journal of Pain & Palliative Care Pharmacotherapy*, **37**, 34-43. <https://doi.org/10.1080/15360288.2022.2149668>
- [15] Moran, B.L., Scott, D.A., Holliday, E., Knowles, S., Saxena, M., Seppelt, I., *et al.* (2022) Pain Assessment and Analgesic Management in Patients Admitted to Intensive Care: An Australian and New Zealand Point Prevalence Study. *Critical Care and Resuscitation*, **24**, 224-232. <https://doi.org/10.51893/2022.3.oa1>
- [16] O'Neill, A. and Lirk, P. (2022) Multimodal Analgesia. *Anesthesiology Clinics*, **40**, 455-468. <https://doi.org/10.1016/j.anclin.2022.04.002>
- [17] Freo, U. (2022) Paracetamol for Multimodal Analgesia. *Pain Management*, **12**, 737-750. <https://doi.org/10.2217/pmt-2021-0116>
- [18] Beverly, A., Kaye, A.D., Ljungqvist, O. and Urman, R.D. (2017) Essential Elements of

- Multimodal Analgesia in Enhanced Recovery after Surgery (ERAS) Guidelines. *Anesthesiology Clinics*, **35**, e115-e143. <https://doi.org/10.1016/j.anclin.2017.01.018>
- [19] Pota, V., Coppolino, F., Barbarisi, A., Passavanti, M.B., Aurilio, C., Sansone, P., *et al.* (2022) Pain in Intensive Care: A Narrative Review. *Pain and Therapy*, **11**, 359-367. <https://doi.org/10.1007/s40122-022-00366-0>
- [20] Sandvik, R.K., Olsen, B.F., Rygh, L. and Moi, A.L. (2020) Pain Relief from Nonpharmacological Interventions in the Intensive Care Unit: A Scoping Review. *Journal of Clinical Nursing*, **29**, 1488-1498. <https://doi.org/10.1111/jocn.15194>
- [21] Nordness, M.F., Hayhurst, C.J. and Pandharipande, P. (2021) Current Perspectives on the Assessment and Management of Pain in the Intensive Care Unit. *Journal of Pain Research*, **14**, 1733-1744. <https://doi.org/10.2147/jpr.s256406>
- [22] National Academies of Sciences, Engineering and Medicine, Health and Medicine Division, Board on Health Sciences Policy, Phillips, J.K., Ford, M.A., Bonnie, R.J., *et al.* (2017) Pain Management and the Opioid Epidemic: Balancing Societal and Individual Benefits and Risks of Prescription Opioid Use. National Academies Press.
- [23] Olsen, B.F., Rustøen, T., Sandvik, L., Jacobsen, M. and Valeberg, B.T. (2016) Results of Implementing a Pain Management Algorithm in Intensive Care Unit Patients: The Impact on Pain Assessment, Length of Stay, and Duration of Ventilation. *Journal of Critical Care*, **36**, 207-211. <https://doi.org/10.1016/j.jcrc.2016.07.011>
- [24] Chanques, G. and Gélinas, C. (2022) Monitoring Pain in the Intensive Care Unit (ICU). *Intensive Care Medicine*, **48**, 1508-1511. <https://doi.org/10.1007/s00134-022-06807-w>