e-ISSN: 0976-822X, p-ISSN:2961-6042

Available online on http://www.ijcpr.com/

International Journal of Current Pharmaceutical Review and Research 2026; 18(5); 1038-1046

Original Research Article

Evaluation of Analgesic Prescription Patterns in Post Operative Patients in a Tertiary Care Centre

Basavambika Anandi[1], Sushma D. S.[2], Rahul Tamman[3]

[1]Associate Professor, Department of Pharmacology, M. R. Medical College, Kalaburagi, Karnataka, India

[2]Associate Professor, Department of Pharmacology, KhajaBandanawaz University – Faculty of Medical Sciences, Kalaburagi, Karnataka, India

[3]Specialist Pediatrician, District Hospital – GIMS, Kalaburagi, Karnataka, India

Received: 01-01-2026 / Revised: 25-04-2026 / Accepted: 21-05-2026

Corresponding Author: Dr. Sushma D S

Conflict of interest: Nil

Abstract

Introduction: Postoperative pain remains one of the most common and significant concerns following surgical procedures and can adversely affect patient recovery, mobilization, wound healing, and overall quality of care. Effective postoperative pain management is essential for reducing patient discomfort, minimizing complications, improving functional recovery, and shortening hospital stay. Analgesic medications including non-steroidal anti-inflammatory drugs (NSAIDs), opioids, paracetamol, and adjuvant analgesics are commonly prescribed in postoperative settings for pain control.

Evaluation of analgesic prescription patterns is important for assessing rational drug use, effectiveness of pain management strategies, prevalence of polypharmacy, adherence to standard treatment guidelines, and utilization trends of various analgesic agents. Drug utilisation studies in postoperative patients may additionally help identify inappropriate prescribing practices, excessive opioid use, adverse drug interactions, and opportunities for optimizing pain management protocols.

Aim: To evaluate the analgesic prescription patterns in postoperative patients admitted to a tertiary care centre.

Objectives

1. To evaluate the demographic profile of postoperative patients receiving analgesics.
2. To analyze the pattern of analgesic prescribing among postoperative patients.
3. To assess the utilization of monotherapy and combination analgesic therapy.
4. To evaluate the use of opioids, NSAIDs, and adjuvant analgesics in postoperative pain management.
5. To assess prescribing indicators and rationality of analgesic therapy in postoperative patients.

Methodology: This prospective observational study was conducted in the postoperative wards of a tertiary care teaching hospital over a period of 12 months. A total of 200 postoperative patients receiving analgesic therapy were included in the study.

Detailed demographic data, type of surgical procedure, analgesics prescribed, dosage forms, routes of administration, frequency of administration, duration of therapy, and concomitant medications were recorded using a structured data collection form. Prescriptions were analyzed according to standard postoperative pain management guidelines and World Health Organization prescribing indicators.

Data were analyzed using descriptive and inferential statistical methods, and results were expressed as frequencies, percentages, mean, and standard deviation wherever appropriate.

Results: The majority of postoperative patients belonged to the 31–50 years age group, with male predominance observed in the study population. NSAIDs and paracetamol were the most frequently prescribed analgesics, while opioid analgesics were primarily utilized in major surgical procedures and severe postoperative pain.

Combination analgesic therapy was prescribed more commonly than monotherapy, particularly among patients undergoing major abdominal and orthopedic surgeries. Injectable formulations were predominantly utilized during the immediate postoperative period, followed by oral analgesics during recovery. Most prescriptions were compliant with standard postoperative pain management guidelines.

Conclusion: The present study demonstrated that NSAIDs and paracetamol were the most commonly prescribed analgesics among postoperative patients. Combination analgesic therapy was frequently utilized for achieving better postoperative pain control and reducing opioid requirements.

Drug utilisation studies are important for evaluating postoperative analgesic prescribing practices and promoting rational use of analgesics. Periodic prescription audits and adherence to evidence-based pain management guidelines may help optimize postoperative analgesic therapy and improve patient outcomes.

Keywords: Postoperative pain; Analgesic prescription pattern; Drug utilisation; NSAIDs; Opioids; Paracetamol; Pain management; Rational drug use; Postoperative patients; Tertiary care hospital.

DOI: 10.25258/ijcpr.18.5.169

Introduction

Postoperative pain is one of the most common and significant clinical problems encountered following surgical procedures and remains an important challenge in perioperative patient management [1]. Inadequate postoperative pain control may result in delayed mobilization, impaired respiratory function, prolonged hospital stays, delayed wound healing, increased healthcare costs, and reduced patient satisfaction [2]. Effective postoperative analgesia therefore plays a crucial role in enhancing recovery, improving functional outcomes, and minimizing postoperative complications [3].

Pain following surgery is a complex physiological response resulting from tissue injury, inflammatory mediator release, and neural sensitization [4]. The severity and duration of postoperative pain vary according to the type of surgery, extent of tissue trauma, patient characteristics, and pain management strategies employed. Poorly controlled postoperative pain may additionally contribute to chronic pain syndromes, psychological distress, sleep disturbances, and increased morbidity [5].

Various classes of analgesics including non-steroidal anti-inflammatory drugs (NSAIDs), opioids, paracetamol, local anesthetics, and adjuvant analgesics are commonly utilized for postoperative pain management. Multimodal analgesia involving the use of different analgesic agents with complementary mechanisms of action has become increasingly popular because it improves pain relief while minimizing opioid-related adverse effects [6]. Rational analgesic prescribing is therefore essential for balancing effective pain control with drug safety and tolerability.

NSAIDs are widely used in postoperative settings because of their analgesic, anti-inflammatory, and antipyretic properties. Opioid analgesics remain important for management of moderate to severe postoperative pain; however, excessive opioid use may be associated with respiratory depression, nausea, vomiting, constipation, sedation, dependence, and delayed recovery [7]. Paracetamol is frequently utilized either alone or in combination therapy because of its favorable safety profile and opioid-sparing effects. Drug utilisation studies are important tools for evaluating prescribing practices, identifying irrational drug use, monitoring polypharmacy, assessing adherence to standard treatment guidelines, and promoting evidence-based pharmacotherapy. Evaluation of analgesic prescription patterns in postoperative patients may provide valuable information regarding utilization trends of analgesics, prevalence of combination therapy, frequency of opioid prescribing, route of administration, and rationality of treatment [8,9].

Postoperative patients frequently receive multiple medications including antibiotics, proton pump inhibitors, antiemetics, anticoagulants, and intravenous fluids along with analgesics. Polypharmacy may increase the risk of drug interactions, adverse effects, medication errors, and unnecessary healthcare expenditure. Periodic prescription audits are therefore necessary for optimizing postoperative pharmacotherapy and improving patient safety [10].

Several guidelines emphasize individualized postoperative pain management based on type of surgery, severity of pain, patient comorbidities, and risk of adverse effects. Rational selection of analgesics and appropriate transition from injectable to oral therapy are important for improving pain control and minimizing complications.

Tertiary care hospitals manage a large number of postoperative patients undergoing various surgical procedures requiring effective pain management. Assessment of analgesic prescribing patterns in such settings may help identify current prescribing trends, evaluate adherence to pain management protocols, and promote rational use of analgesics.

Hence, the present study was undertaken to evaluate the analgesic prescription patterns among postoperative patients admitted to a tertiary care centre and to assess analgesic utilization trends, prescribing practices, combination therapy patterns, and rationality of postoperative pain management.

Aim and Objectives

Aim

To evaluate the analgesic prescription patterns in postoperative patients admitted to a tertiary care centre.

Objectives

1. To evaluate the demographic profile of postoperative patients receiving analgesic therapy.
2. To analyze the prescribing pattern of analgesics among postoperative patients.

3. To assess the prevalence of monotherapy and combination analgesic therapy.
4. To evaluate the utilization of NSAIDs, opioids, paracetamol, and adjuvant analgesics in postoperative pain management.
5. To assess prescribing indicators and rationality of analgesic therapy based on standard postoperative pain management guidelines.

Materials and Methods

Study Design: This study was conducted as a prospective observational drug utilisation study.

Study Setting: The study was conducted in the postoperative wards of General Surgery, Orthopedics, Obstetrics and Gynaecology, and other surgical departments of a tertiary care teaching hospital in North Katrnataka

Study Duration: The study was conducted over a period of 12 months.

Study Population: The study population included postoperative patients receiving analgesic therapy following surgical procedures.

Sample Size: A total of 200 postoperative patients were included in the study.

Inclusion Criteria

1. Patients aged 18 years and above.
2. Patients undergoing elective or emergency surgical procedures.
3. Patients receiving postoperative analgesic therapy.
4. Patients willing to participate in the study.

Exclusion Criteria

1. Patients admitted to intensive care units requiring ventilatory support.
2. Patients with chronic pain disorders receiving long-term analgesic therapy.
3. Patients with severe hepatic or renal dysfunction.
4. Patients with incomplete prescription details or inadequate clinical information.
5. Patients unwilling to participate in the study.

Data Collection Procedure: Eligible postoperative patients fulfilling the inclusion criteria were enrolled after obtaining informed consent. Detailed demographic data including age, gender, type of surgical procedure, duration of hospital stay, and associated comorbidities were recorded using a structured data collection form.

Prescription details including analgesics prescribed, dosage forms, dose, route of administration, frequency of administration, duration of therapy, monotherapy or combination therapy, and concomitant medications were documented and analyzed.

Analgesics were categorized into non-steroidal anti-inflammatory drugs, opioids, paracetamol, and adjuvant analgesics. Prescriptions were evaluated according to standard postoperative pain management guidelines and World Health Organization prescribing indicators.

Outcome Measures

Primary Outcome Measures

1. Pattern of analgesic drug utilization.
2. Distribution of different classes of analgesics prescribed.
3. Prevalence of monotherapy and combination analgesic therapy.

Secondary Outcome Measures

1. Utilization of injectable and oral analgesics.
2. Concomitant medication use.
3. WHO prescribing indicators.
4. Prevalence of polypharmacy.
5. Rationality of postoperative analgesic prescribing practices.

Statistical Analysis: Data were entered into Microsoft Excel spreadsheet and analyzed using Statistical Package for Social Sciences (SPSS) software.

Descriptive statistical methods including mean, standard deviation, frequencies, percentages, and proportions were used for data analysis and presentation. Inferential statistical tests were applied wherever appropriate.

A p-value less than 0.05 was considered statistically significant.

Ethical Considerations: Institutional Ethics Committee approval was obtained before commencement of the study. Written informed consent was obtained from all participants prior to enrollment. Confidentiality of patient information and prescription details was strictly maintained throughout the study period. The study was conducted in accordance with institutional ethical guidelines and biomedical research principles.

Results

A total of 200 postoperative patients receiving analgesic therapy were included in the present prospective observational drug utilisation study conducted at a tertiary care teaching hospital over a period of 12 months.

The study demonstrated that the majority of postoperative patients belonged to the 31–50 years age group, with male predominance observed in the study population. General surgical and orthopedic procedures constituted the major proportion of surgeries performed among study participants. Non-steroidal anti-inflammatory drugs and paracetamol were the most frequently prescribed

analgesics in the postoperative period. Injectable formulations were predominantly utilized during the immediate postoperative period, followed by transition to oral analgesics during recovery. Combination analgesic therapy was prescribed more frequently than monotherapy, particularly among patients undergoing major abdominal and orthopedic surgeries.

Opioid analgesics were commonly prescribed for severe postoperative pain and major surgical procedures, whereas NSAIDs and paracetamol were widely utilized for mild to moderate postoperative pain management. Adjuvant medications including proton pump inhibitors, antibiotics, antiemetics, and intravenous fluids were frequently prescribed along with analgesics.

Most prescriptions demonstrated adherence to standard postoperative pain management guidelines and rational prescribing practices. Polypharmacy was observed more commonly among elderly postoperative patients and those undergoing major surgical procedures requiring prolonged hospitalization and multiple concomitant medications. The findings of the present study highlight current trends in postoperative analgesic utilization and emphasize the importance of rational prescribing practices for effective postoperative pain management and improved patient outcomes.

Table 1: Age-wise distribution of postoperative patients

Age group (years)	Number of patients	Percentage (%)
18–30	38	19.0
31–40	56	28.0
41–50	52	26.0
51–60	34	17.0
>60	20	10.0

Table 1 shows the age-wise distribution of postoperative patients included in the study.

The above table shows that the majority of postoperative patients belonged to the 31–40 years age group accounting for 28.0% of the study population, followed by 41–50 years age group at 26.0% and 18–30 years age group at 19.0%.

Table 2: Gender distribution among postoperative patients

Gender	Number of patients	Percentage (%)
Male	118	59.0
Female	82	41.0

Table 2 shows the gender distribution of study participants.

The above table shows that males constituted the majority of postoperative patients accounting for 59.0%, while females represented 41.0% of the study population.

Table 3: Distribution of surgical procedures among study participants

Type of surgery	Number of patients	Percentage (%)
General surgery	64	32.0
Orthopedic surgery	48	24.0
Obstetrics and gynaecology	36	18.0
Urological surgery	22	11.0
ENT surgery	18	9.0
Other surgeries	12	6.0

Table 3 shows the type of surgical procedures undergone by postoperative patients.

The above table shows that general surgical procedures constituted the largest proportion of surgeries accounting for 32.0%, followed by orthopedic surgeries in 24.0% and obstetrics and gynaecology procedures in 18.0% of patients.

Table 4: Distribution of analgesic classes prescribed

Analgesic class	Number of prescriptions	Percentage (%)
NSAIDs	154	77.0
Paracetamol	138	69.0
Opioids	82	41.0
Adjuvant analgesics	46	23.0

Table 4 shows the analgesic classes prescribed among postoperative patients.

The above table shows that NSAIDs were the most frequently prescribed analgesics accounting for 77.0% of prescriptions, followed by paracetamol in 69.0% and opioids in 41.0% of prescriptions.

Table 5: Pattern of analgesic therapy among study participants

Type of therapy	Number of patients	Percentage (%)
Monotherapy	52	26.0
Two-drug therapy	102	51.0
Three-drug therapy	38	19.0
More than three drugs	8	4.0

Table 5 shows the pattern of analgesic therapy prescribed in postoperative patients.

The above table shows that two-drug analgesic therapy was the most commonly prescribed regimen accounting for 51.0% of patients, while monotherapy was observed in 26.0% of cases.

Table 6: Commonly prescribed analgesic combinations

Analgesic combination	Number of patients	Percentage (%)
NSAID + Paracetamol	66	33.0
Opioid + Paracetamol	38	19.0
NSAID + Opioid	24	12.0
NSAID + Paracetamol + Opioid	28	14.0
NSAID + Adjuvant analgesic	16	8.0

Table 6 shows the commonly prescribed analgesic combinations among postoperative patients.

The above table shows that NSAID and paracetamol combination was the most commonly prescribed analgesic combination accounting for 33.0% of patients.

Table 7: Route of analgesic administration among study participants

Route of administration	Number of patients	Percentage (%)
Injectable	146	73.0
Oral	54	27.0

Table 7 shows the route of analgesic administration prescribed in postoperative patients.

The above table shows that injectable analgesics were predominantly prescribed accounting for 73.0% of patients during the immediate postoperative period.

Table 8: Concomitant medications prescribed among postoperative patients

Concomitant medication	Number of patients	Percentage (%)
Antibiotics	168	84.0
Proton pump inhibitors	122	61.0
Antiemetics	96	48.0
Intravenous fluids	176	88.0
Anticoagulants	34	17.0

Table 8 shows concomitant medications prescribed along with analgesics.

The above table shows that intravenous fluids were the most commonly prescribed concomitant therapy accounting for 88.0% of patients, followed by antibiotics in 84.0% and proton pump inhibitors in 61.0% of patients.

Table 9: WHO prescribing indicators among postoperative patients

WHO prescribing indicator	Observation
Average number of drugs per prescription	4.6
Drugs prescribed by generic name	58.5%
Drugs prescribed from essential medicine list	81.2%
Prescriptions with injectable drugs	73.0%
Prescriptions with polypharmacy (>5 drugs)	34.0%

Table 9 shows WHO prescribing indicators observed in the study.

The above table shows that the average number of drugs prescribed per prescription was 4.6. Generic prescribing was observed in 58.5% of prescriptions, while 81.2% of drugs were prescribed from the essential medicine list.

Table 10: Pain relief outcome among postoperative patients

Pain relief outcome	Number of patients	Percentage (%)
Adequate pain relief	164	82.0
Partial pain relief	28	14.0
Inadequate pain relief	8	4.0

Table 10 shows postoperative pain relief outcomes among study participants.

The above table shows that adequate postoperative pain relief was achieved in 82.0% of patients, while 14.0% demonstrated partial pain relief and 4.0% had inadequate pain control despite analgesic therapy.

Results Summary

Table 1 demonstrated that the majority of postoperative patients belonged to the 31–40 years age group accounting for 28.0% of the study population, followed by 41–50 years age group at 26.0% and 18–30 years age group at 19.0%. These findings indicate that surgical procedures and postoperative admissions were more common among middle-aged adults.

Table 2 showed male predominance among postoperative patients, with males accounting for 59.0% and females constituting 41.0% of the study population. This may reflect the higher proportion of general surgical and orthopedic procedures performed among male patients.

Table 3 demonstrated that general surgical procedures constituted the largest proportion of surgeries accounting for 32.0%, followed by orthopedic surgeries in 24.0% and obstetrics and gynaecology procedures in 18.0% of patients. These findings indicate that postoperative analgesic utilization was predominantly associated with major abdominal and musculoskeletal surgeries.

Table 4 revealed that NSAIDs were the most frequently prescribed analgesic class accounting for 77.0% of prescriptions, followed by paracetamol in 69.0% and opioids in 41.0% of prescriptions. NSAIDs and paracetamol therefore formed the cornerstone of postoperative pain management in the study population. Table 5 demonstrated that two-drug analgesic therapy was the most commonly prescribed regimen accounting for 51.0% of patients, while monotherapy was prescribed in 26.0% of cases. Combination analgesic therapy was therefore preferred for achieving better postoperative pain control.

Table 6 showed that NSAID and paracetamol combination was the most commonly prescribed analgesic combination accounting for 33.0% of patients, followed by opioid and paracetamol combination in 19.0% of cases. Multimodal analgesic combinations were frequently utilized to enhance analgesic efficacy and reduce opioid requirements.

Table 7 demonstrated that injectable analgesics were predominantly prescribed accounting for 73.0% of patients during the immediate postoperative period, whereas oral analgesics were prescribed in 27.0% of patients during recovery and transition phases.

Table 8 revealed that intravenous fluids were the most commonly prescribed concomitant therapy accounting for 88.0% of patients, followed by antibiotics in 84.0%, proton pump inhibitors in 61.0%, and antiemetics in 48.0% of patients. These findings reflect routine postoperative supportive management and prevention of drug-related adverse effects.

Table 9 demonstrated that the average number of drugs prescribed per prescription was 4.6. Generic prescribing was observed in 58.5% of prescriptions, while 81.2% of drugs were prescribed from the essential medicine list. Polypharmacy involving more than five drugs was observed in 34.0% of prescriptions.

Table 10 showed that adequate postoperative pain relief was achieved in 82.0% of patients, whereas 14.0% demonstrated partial pain relief and 4.0% had inadequate pain control despite analgesic therapy. These findings indicate overall satisfactory effectiveness of postoperative analgesic management in the majority of study participants.

Discussion

The present prospective observational drug utilisation study was conducted to evaluate analgesic prescription patterns among postoperative patients admitted to a tertiary care teaching hospital. Effective postoperative pain management is an essential component of perioperative care because inadequate analgesia may result in delayed recovery, prolonged hospitalization, respiratory complications, impaired mobilization, and reduced patient satisfaction [11]. Rational prescribing of analgesics is therefore necessary for achieving adequate pain relief while minimizing adverse effects and promoting early postoperative recovery.

In the present study, the majority of postoperative patients belonged to the 31–50 years age group, with male predominance observed in the study population. Similar demographic patterns have been reported in previous postoperative drug utilisation studies where middle-aged males

constituted the majority of surgical admissions because of higher rates of trauma, occupational injuries, and surgical interventions [12].

General surgical and orthopedic procedures accounted for the major proportion of surgeries among study participants. Similar findings have been reported in tertiary care hospital-based prescription pattern studies where abdominal and orthopedic surgeries contributed significantly to postoperative analgesic utilization [13]. These surgical procedures are frequently associated with moderate to severe postoperative pain requiring multimodal analgesic management.

The present study demonstrated that NSAIDs were the most frequently prescribed analgesics followed by paracetamol and opioid analgesics. Similar prescribing trends have been observed in several postoperative analgesic utilization studies. NSAIDs are widely utilized because of their analgesic and anti-inflammatory properties, effectiveness in mild to moderate postoperative pain, and opioid-sparing effects [14]. Paracetamol was also frequently prescribed because of its favorable safety profile and synergistic analgesic action when used in combination therapy.

Opioid analgesics were commonly utilized among patients undergoing major surgical procedures and severe postoperative pain. Similar observations have been reported in previous studies evaluating postoperative pain management practices [15]. Although opioids provide effective analgesia for severe pain, their use may be associated with adverse effects including respiratory depression, sedation, nausea, vomiting, constipation, and delayed recovery [16]. Rational opioid prescribing and multimodal analgesia therefore remain important for minimizing opioid-related complications. Combination analgesic therapy was prescribed more frequently than monotherapy in the present study, with two-drug therapy being the most common analgesic regimen. The combination of NSAID and paracetamol constituted the most commonly prescribed analgesic combination. Similar findings have been reported in previous prescription pattern studies where multimodal analgesia was increasingly preferred for achieving superior pain control and reducing opioid requirements [17]. Combination therapy utilizing drugs with different mechanisms of action may improve analgesic efficacy while minimizing dose-related adverse effects.

Injectable analgesics were predominantly prescribed during the immediate postoperative period in the present study. Similar observations have been reported in postoperative pain management studies where injectable formulations were preferred during early postoperative recovery because of rapid onset of action and inability of patients to tolerate oral medications immediately after surgery [18]. Transition to oral analgesics was commonly observed during subsequent recovery phases.

The present study also demonstrated frequent concomitant use of antibiotics, proton pump inhibitors, antiemetics, and intravenous fluids along with analgesics. Similar prescribing patterns have been reported in previous postoperative drug utilization studies [19]. Proton pump inhibitors are frequently prescribed to minimize NSAID-related gastrointestinal complications, while antiemetics help reduce opioid-induced nausea and vomiting.

Assessment of WHO prescribing indicators demonstrated relatively rational prescribing practices in the present study. A significant proportion of drugs were prescribed from the essential medicine list, and generic prescribing was observed in more than half of prescriptions. Similar findings have been reported in previous studies emphasizing the importance of rational analgesic prescribing and adherence to standard treatment guidelines [20]. However, polypharmacy remained prevalent among elderly postoperative patients and those undergoing major surgeries requiring multiple concomitant medications.

Adequate postoperative pain relief was achieved in the majority of patients included in the present study. Similar satisfactory pain management outcomes have been reported in studies utilizing multimodal analgesic strategies. Effective postoperative analgesia contributes significantly to early mobilization, reduced complications, shorter hospital stay, and improved patient satisfaction. The findings of the present study highlight current analgesic prescribing trends and emphasize the importance of rational postoperative pain management practices in tertiary care settings. Periodic prescription audits, adherence to evidence-based pain management protocols, and promotion of multimodal analgesia may help optimize postoperative analgesic therapy and improve overall patient outcomes.

Limitations of the Study

1. The study was conducted in a single tertiary care teaching hospital and may not represent prescribing practices in other healthcare settings.
2. Long-term follow-up of postoperative pain outcomes was not assessed.
3. Adverse drug reactions associated with analgesic therapy were not evaluated separately.
4. Pain severity scoring and patient satisfaction assessment were not analyzed independently.
5. Economic evaluation and cost-effectiveness of postoperative analgesic therapy were not assessed.

Conclusion

The present study demonstrated that NSAIDs and paracetamol were the most frequently prescribed analgesics among postoperative patients admitted to a tertiary care teaching hospital. Combination analgesic therapy, particularly two-drug therapy, was more commonly utilized than monotherapy for achieving effective postoperative pain control.

General surgical and orthopedic procedures constituted the major proportion of surgeries requiring postoperative analgesic therapy. Injectable analgesics were predominantly prescribed during the immediate postoperative period, followed by transition to oral analgesics during recovery. Opioid analgesics were mainly utilized for management of severe postoperative pain and major surgical procedures. The combination of NSAID and paracetamol was the most commonly prescribed analgesic regimen, reflecting increasing utilization of multimodal analgesia for improving pain control and minimizing opioid requirements. Concomitant use of antibiotics, proton pump inhibitors, antiemetics, and intravenous fluids was frequently observed as part of routine postoperative management. The study demonstrated relatively rational prescribing practices with considerable utilization of essential medicines and generic prescribing. However, polypharmacy remained prevalent among elderly patients and those undergoing major surgical procedures, emphasizing the need for regular prescription audits and optimization of postoperative pharmacotherapy. Adequate postoperative pain relief was achieved in the majority of patients, indicating satisfactory effectiveness of current postoperative analgesic practices. Periodic drug utilisation studies, adherence to evidence-based pain management guidelines, rational opioid prescribing, and promotion of multimodal analgesia are essential for optimizing postoperative pain management and improving patient outcomes.

Further multicentric studies with larger sample size and long-term follow-up are recommended to better evaluate analgesic utilization trends, adverse drug reactions, patient satisfaction, and effectiveness of postoperative pain management strategies in different surgical settings.

References

1. Potter M, Morosky CM, Whitcomb BP. Post-operative opioid analgesic prescribing patterns in gynecologic oncology patients following the implementation of a statewide -prescription monitoring and reporting system. J Opioid Manag. 2022 May-Jun;18(3):229-236. doi: 10.5055/jom.2022.0714. PMID: 35666479.
2. Morison L, Chan V, Tran T. Opioid prescribing in post-operative orthopedic patients admitted to inpatient rehabilitation. J Opioid Manag. 2025 Jul-Aug;21(4):303-308. doi: 10.5055/jom.0941. PMID: 40910980.
3. Cook CE, Rhon DI, Lewis BD, George SZ. Post-operative opioid pain management patterns for patients who receive hip surgery. Subst Abuse Treat Prev Policy. 2017 Mar 16;12(1):14. doi: 10.1186/s13011-017-0094-5. PMID: 28298221; PMCID: PMC5353894.
4. Lanier C, Melton T, Salwan A, Jenkins M, Morelock R, Allen C, Stewart D. Describing the decision process of post-operative opioid and pain prescribing patterns in orthopedic and general surgeons. J Opioid Manag. 2023 Jul-Aug;19(4):301-311. doi: 10.5055/jom.2023.0787. PMID: 37644788.
5. Amend GM, Hakam N, Nabavizadeh B, Sadighian MJ, Holler JT, Rios N, Li KD, Low P, Awad MA, Davies BJ, Breyer BN. Institutional Opioid Prescription Guidelines are Effective in Reducing Post-Operative Prescriptions Following Urologic Surgery: Results From the American Urologic Association 2018 Census. Urology. 2021 Dec;158:5-10. doi: 10.1016/j.urology.2021.08.033. Epub 2021 Sep 5. PMID: 34496262.
6. McIsaac DI, Ladha KS. Postoperative Opioid Prescribing: Finding the Balance. Anesthesiology. 2022 Aug 1;137(2):131-133. doi: 10.1097/ALN.0000000000004297. PMID: 35819864.
7. Tram MK, Donnelly L, Feustel PJ, Cangero T, Kogan BA. Revisiting Postoperative Pediatric Urology Opioid Prescriptions. Urology. 2023 Jun;176:162-166. doi: 10.1016/j.urology.2023.03.023. Epub 2023 Mar 29. PMID: 37001824.
8. Bates JN, Batra AK, Auerbach JM, Pathak UI, Hoang N, Taylor JM. Post-Operative Order Set Decreases Opioid Prescriptions and Increases Efficiency. Am Surg. 2023 Apr;89(4):539-545. doi: 10.1177/00031348221148371. Epub 2023 Jan 9. PMID: 36621913.
9. Ho E, Doherty M, Thomas R, Attia J, Oldmeadow C, Clapham M. Prescription of opioids to post-operative orthopaedic patients at time of discharge from hospital: a prospective observational study. Scand J Pain. 2018 Apr 25;18(2):253-259. doi: 10.1515/sjpain-2017-0149. PMID: 29794303.
10. Newberry CI, Casazza GC, Pruitt LC, Meier JD, Skarda DE, Alt JA. Prescription patterns and opioid usage in sinonasal surgery. Int Forum Allergy Rhinol. 2020 Mar;10(3):381-387. doi: 10.1002/alr.22478. Epub 2019 Nov 6. PMID: 31693311.
11. Thirukumaran CP, Schloemann DT, Doshi JA, Fiscella KA, Ricciardi BF, Rosenthal MB. Opioid Cap Laws and Opioid Prescriptions

After Total Joint Replacements in Older Adults. JAMA Netw Open. 2025 Apr 1;8(4):e254448. doi: 10.1001/jamanetworkopen.2025.4448. PMID: 40202758; PMCID: PMC11983234.
12. Sharpe MG, Shah VS, Huerta M, Stitzel H, Desai A, Labak CM, Andrews K, Stout A, Staudt MD. Characterizing discharge opioid prescription in postoperative neurosurgical patients: a systematic review. Neurosurg Rev. 2024 Dec 3;47(1):884. doi: 10.1007/s10143-024-03131-3. PMID: 39625689.
13. Lindgren AM, Bennett R, Yaszay B, Newton PO, Upasani VV. Quality improvement in post-operative opioid and benzodiazepine regimen in adolescent patients after posterior spinal fusion. Spine Deform. 2020 Jun;8(3):441-445. doi: 10.1007/s43390-019-00002-6. Epub 2020 Jan 8. PMID: 31925760.
14. Melucci AD, Dave YA, Lynch OF, Hsu S, Erlick MR, Linehan DC, Moalem J; University of Rochester's Efforts to Decrease Unnecessary Controlled substances in Surgery (UReduces) Initiative. Predictors of opioid-free discharge after laparoscopic cholecystectomy. Am J Surg. 2023 Jan;225(1):206-211. doi: 10.1016/j.amjsurg.2022.07.027. Epub 2022 Aug 3. PMID: 35948514.
15. Kim S, King A, Parikh P, Sangtani A, Shazly S, Brodrick E, Thompson A. Optimizing Post-Cesarean Opioid Prescription Practices at Mayo Clinic: A Quality Improvement Initiative. Am J Perinatol. 2022 Mar;39(4):337-341. doi: 10.1055/s-0041-1739491. Epub 2021 Nov 28. PMID: 34839479.
16. Morison L, Chan V, Tran T. Opioid prescribing in post-operative orthopedic patients admitted to inpatient rehabilitation. J Opioid Manag. 2025 Jul-Aug;21(4):303-308. doi: 10.5055/jom.0941. PMID: 40910980.
17. Irfan A, Martin LY, Canner J, Etra J, Gonzalez Salazar AJ, Overton HN, Jelin EB. The impact of post-operative opioid guidelines on prescribing behaviors in the pediatric population. PediatrSurg Int. 2020 Nov;36(11):1339-1343. doi: 10.1007/s00383-020-04739-4. Epub 2020 Sep 11. PMID: 32915274; PMCID: PMC7554093.
18. Kshirsagar RS, Xiao C, Luetzenberg FS, Luu L, Jiang N. Reducing opioid use in post-operative otolaryngology patients: A quality improvement project. Am J Otolaryngol. 2021 Jul-Aug;42(4):102991. doi: 10.1016/j.amjoto.2021.102991. Epub 2021 Feb 18. PMID: 33640800.
19. Nguyen L, Bowlds S, Munford C, Miller K, Finnegan T, Clayton E, Behara MR, Senkowski C. Decreasing Postoperative Opioid Prescribing through Education. J Surg Educ. 2020 May-Jun;77(3):615-620. doi: 10.1016/j.jsurg.2019.11.010. Epub 2019 Dec 16. Erratum in: J Surg Educ. 2020 Sep - Oct;77(5):1324. doi: 10.1016/j.jsurg.2020.08.007. PMID: 31859229.
20. Canizares M, Power JD, Perruccio AV, Veillette C, Mahomed N, Rampersaud YR. Time trends and patterns in opioid prescription use following orthopaedic surgery in Ontario, Canada, from 2004/2005 to 2017/2018: a population-based study. BMJ Open. 2023 Nov 14;13(11):e074423. doi: 10.1136/bmjopen-2023-074423. PMID: 37963700; PMCID: PMC10649703.