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Non-steroidal anti-inflammatory drugs as adjuncts to local anesthesia and peri-endodontic pain management: a focused clinical review

Andreas Kokkas[1,*], Charikleia Ntenti[2], Olga Gerasimidou[3]

[1]Division of Dental Tissues, Pathology and Therapeutics (Basic Dental Sciences, Endodontology and Operative Dentistry), School of Dentistry, Aristotle University Thessaloniki, Thessaloniki, Greece
[2]Laboratory of Pharmacology, School of Medicine, Aristotle University of Thessaloniki, Thessaloniki, Greece
[3]Division of Dental Tissues, Pathology and Therapeutics (Basic Dental Sciences, Endodontology and Operative Dentistry), School of Dentistry, Aristotle University Thessaloniki, Thessaloniki, Greece

***Corresponding author:** Andreas Kokkas, Division of Dental Tissues, Pathology and Therapeutics (Basic Dental Sciences, Endodontology and Operative Dentistry), School of Dentistry, Aristotle University Thessaloniki, 541 24 Thessaloniki, Greece; Tel.: +30-6974710794; email: akokkas@yahoo.com

ABSTRACT

Pain control is an integral part of endodontic treatment, from diagnosis of the painful tooth to local anesthesia and management of postoperative pain. Non-steroidal anti-inflammatory drugs (NSAIDs) are used at several of these stages, although their purpose is not the same in each situation. This focused narrative review considers the use of NSAIDs in nonsurgical endodontic treatment before, during, and after treatment, including their effect on anesthetic success and the limitations imposed by patient-related factors. Available evidence suggests that an oral NSAID given before treatment may improve inferior alveolar nerve block (IANB) success in mandibular molars with symptomatic irreversible pulpitis. However, differences in the drugs and doses studied and in the assessment of anesthetic success do not allow one regimen to be recommended for all patients. NSAIDs, alone or with acetaminophen, can also reduce postoperative pain during the first 6–24 hours, whereas benefit beyond 48 hours is less clear. Their use requires consideration of gastrointestinal, renal, cardiovascular, hepatic, and bleeding risks, together with allergy, pregnancy, and interactions with other medication. NSAIDs can therefore be useful adjuncts in selected patients, but effective pain management still requires accurate diagnosis, adequate local anesthesia and definitive treatment, with reassessment when symptoms persist.

KEYWORDS

local anesthesia, endodontics, postoperative pain, premedication, pulpitis

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1. INTRODUCTION

Pain control is a continuing part of endodontic care, from the first examination of a patient with pulpal or periapical pain until the early period after treatment. non-steroidal anti-inflammatory drugs (NSAIDs) may be used at several points during this time, but the clinical reason for prescribing them before treatment is not necessarily the same as the reason for their use after treatment [1,2].

Non-opioid analgesics commonly used in dentistry include acetaminophen and NSAIDs, alongside opioids [3]. NSAIDs constitute a large, heterogeneous group of compounds, primarily weak organic acids with analgesic, antipyretic, and, at higher doses, anti-inflammatory properties. They are generally well absorbed following oral administration. Compared to opioids, NSAIDs exhibit lower toxicity, lack sedative and respiratory depressant effects, and do not induce dependence.

NSAIDs, and particularly ibuprofen, are frequently prescribed in dental and endodontic practice, although the drug selected is not always closely matched to the clinical indication [4,5].

The present focused narrative review considers how NSAIDs are used in nonsurgical endodontic treatment, including the management of pain before treatment, their possible influence on diagnosis and local anesthesia, and the control of pain after treatment. The purpose is not to recommend a single drug or regimen for routine use. Rather, the available evidence is examined in relation to the particular clinical situation in which the NSAID is being used and to the patient factors that may limit or modify its use.

2. REVIEW SCOPE AND CLINICAL APPROACH

The distinction between preoperative and postoperative NSAID use is important because the two clinical questions do not have the same outcome. Studies of inferior alveolar nerve block (IANB) in mandibular molars with symptomatic irreversible pulpitis examine whether anesthesia is successful, whereas postoperative studies examine pain at defined periods after treatment [6,7]. Considering these outcomes together may give the misleading impression that NSAIDs are necessary in the same way for every endodontic situation.

The evidence is therefore discussed in relation to the clinical stage of treatment. Before treatment, the clinician is concerned with diagnosis, the pain already present, and any medication taken before the appointment. During treatment, the practical question is whether satisfactory anesthesia has been obtained and, if not, what supplemental technique is required. After treatment, the emphasis changes to the amount and duration of pain relief and to whether continuing symptoms require clinical reassessment rather than further medication.

This is a focused narrative clinical review. High-level evidence and selected articles support and inform the clinical rationale without the formal and systematic process of selection and analysis utilized by systematic reviewers. Therefore, a study flow-chart is not presented, nor should this report be viewed as a treatment protocol. Accordingly, the question of IANB success is considered separately from postoperative pain, as these outcomes are also addressed independently in previous reviews [6,7].

PubMed, PubMed Central, and ScienceDirect were searched for English-language publications available up to July 2026 using combinations of the keywords “NSAIDs,” “endodontics,” “pulp inflammation,” and “postoperative pain.” Related terms, including “non-steroidal anti-inflammatory drugs,” “irreversible pulpitis,” “inferior alveolar nerve block,” “local anesthesia,” “preoperative medication,” “post-endodontic pain,” and “root canal treatment,” were also used to identify relevant publications. The keywords and related terms were combined using the Boolean operators “OR” and “AND” (between concepts). Articles were selected after reading their title and abstract. The full texts of the selected articles were then read, and the evidence was grouped by clinical stage (before, during, and after treatment) and by outcome. Publications were considered eligible if they dealt with NSAIDs given before, during, or after nonsurgical endodontic treatment and reported anesthetic success or pain outcomes, or if they provided pharmacological or safety information relevant to this use. Publications limited to surgical endodontics, to animal or *in vitro* models, or to topics unrelated to NSAIDs, as well as publications not available in English, were not considered. The risk of bias of the individual studies was not formally assessed, and no quantitative synthesis was undertaken. References from the selected articles were also considered for review. Systematic reviews, umbrella reviews, network meta-analyses, randomized clinical trials, narrative reviews, and relevant pharmacological and safety studies were considered.

3. INFLAMMATORY PAIN AND CHALLENGES TO LOCAL ANESTHESIA IN ENDODONTICS

3.1. Inflammatory sensitization in pulpal and periapical disease

Inflammation is a major part of the pain arising from pulpal and periapical disease. Prostaglandins formed through the cyclooxygenase pathway contribute to inflammation, peripheral sensitization, and pain transmission [8]. As this response develops, nociceptors become more easily activated and stimuli that would normally be tolerated may become painful. This is of particular importance in

symptomatic irreversible pulpitis, where the inflamed pulp is associated with a lower pain threshold and local anesthesia is less predictable [1]. The degree of pain experienced by the patient may therefore depend not only on the pulpal or periapical diagnosis, but also on the degree of inflammatory sensitization present when treatment is carried out.

This provides a pharmacological basis for considering an NSAID when endodontic pain is inflammatory in origin. Inhibition of cyclooxygenase reduces prostaglandin synthesis and may lessen pain; it may also improve the response to local anesthesia in inflamed tissues [1,8]. However, reduction of inflammation does not remove the cause of the endodontic pain. Diagnosis and appropriate operative treatment remain necessary, with the NSAID used as an adjunct when there is a clinical indication for it.

3.2. Implications for pain and local anesthetic efficacy

The principal mechanism of action of NSAIDs is the inhibition of cyclooxygenase (COX) enzymes, leading to reduced synthesis of prostaglandins involved in inflammation, peripheral sensitization, pain transmission, and fever [8]. Two cyclooxygenase isoforms have been identified, COX-1 (Cyclooxygenase-1) and COX-2 (Cyclooxygenase-2), which differ in their physiological functions and tissue distribution. COX-1 is constitutively expressed in most tissues and is involved in gastric mucosal protection, platelet aggregation, and renal homeostasis, whereas COX-2 is primarily induced during inflammation [8]. Selective NSAIDs (COX-2 inhibitors) preferentially inhibit the COX-2 isoform, which is mainly associated with inflammatory processes [8].

3.3. Clinical rationale for short-term NSAID use

Inflammation in painful, irreversible pulpitis reduces pain thresholds and may compromise local anesthetic efficacy [1]. Thus, the therapeutic goal of preoperative administration of analgesic and anti-inflammatory drugs is not only to provide pain relief prior to treatment, but also to reduce inflammatory sensitization in order to promote successful local anesthesia. Postoperative administration, however, is aimed at limiting early phase pain of a relatively short duration as it resolves postoperatively. The two indications are similar in spirit but not identical in purpose.

These drugs should be prescribed only after a clinical assessment has already been carried out which considers pain etiology, type of procedure to be carried out, estimated length of treatment, associated pathology and drugs taken, and any other factors that can lead to the contraindication. Indeed, the endodontic procedure for pain of endodontic origin is considered the main treatment, whereas any drugs prescribed to support the pharmacological strategy should be considered adjunctive and should not be represented as definitive therapy [1,2,9].

4. NSAID USE BEFORE ENDODONTIC TREATMENT

4.1. Preoperative pain and definitive endodontic care

In the absence of contraindications, NSAIDs are generally considered first-line drugs for pain of endodontic origin. If an NSAID alone provides inadequate relief, it may be combined with acetaminophen or a centrally acting analgesic [2].

4.2. Preoperative medication and diagnostic interpretation

NSAIDs taken before the dental appointment may affect responses to endodontic diagnostic tests. Ibuprofen was reported to mask responses in vital teeth by 40% for palpation, 25% for percussion, and 25% for cold testing in teeth with symptomatic irreversible pulpitis and symptomatic apical periodontitis [10].

4.3. NSAID premedication before local anesthesia

Preoperative pain, often accompanied by increased patient anxiety, has been associated with a greater risk of inadequate local anesthesia and postoperative pain. Local anesthesia is successful in 75–90% of patients with clinically normal teeth but is significantly less effective in patients with inflamed tissues [1]. The increased sensitization of nociceptors associated with inflammation decreases the success of IANB, whereas premedication with more than 400 mg of ibuprofen may improve its success rate [11].

5. NSAIDS AS ADJUNCTS TO LOCAL ANESTHESIA

5.1. Evidence for improved IANB success

Available evidence suggests that NSAID premedi-

cation may improve anesthesia in mandibular molars with symptomatic irreversible pulpitis when a standard IANB is used. An umbrella review published in 2023 searched six databases and included 12 systematic reviews. It reported a generally favorable effect for ibuprofen, oxicams, diclofenac, ketorolac, and ibuprofen/acetaminophen [6]. However, AMSTAR 2 (a measurement tool to assess systematic reviews 2) confidence ratings ranged from very low to high, so these findings do not support a single prescribing regimen for all patients.

A previous systematic review of 27 randomized placebo-controlled trials found moderate evidence supporting NSAID use for preoperative and postoperative endodontic pain, but did not identify the best NSAID, dose, or regimen for the different clinical conditions [2]. Therefore, a preoperative NSAID may be useful in a patient with symptomatic irreversible pulpitis of a mandibular molar when difficulty with the standard IANB is expected and no contraindication is present.

The evidence considered in the umbrella review concerned standard IANB in mandibular molars with symptomatic irreversible pulpitis. The findings should therefore not be extended to other patient groups, anesthetic techniques, or combinations of techniques without supporting evidence [6]. The population studied, the anesthetic used, the medication regimen, and the definition of success should all be considered before a clinical recommendation is made.

Evidence suggests that the preoperative oral administration of NSAIDs increases the success of IANB anesthesia [6,11-15]. NSAIDs appear to act through cyclooxygenase pathways by reducing the synthesis of prostaglandins that interfere with anesthetic efficacy in inflamed tissues, thereby improving the success of local anesthesia [6].

Administering ibuprofen before performing IANB anesthesia increases the likelihood of anesthetic success [13]. Compared with acetaminophen, ibuprofen and certain other NSAIDs appear to provide a greater improvement in the overall success of IANB [14]. For this indication, a single dose of ibuprofen (>400 mg), ketorolac (10 mg), or diclofenac appears to be adequate [15].

Giving ibuprofen one hour before the local anesthetic injection has likewise been reported to facilitate profound anesthesia during root canal treatment [16]. Similarly, administration of acetaminophen 1000 mg, ibuprofen 800 mg, or aceclofenac 100 mg before treatment significantly increased the effectiveness of maxillary infiltration anesthesia with 2% lidocaine and 1:200,000 epinephrine one hour later [17].

Administration of ibuprofen 600 mg or meloxicam 7.5 mg has also been reported to increase the success of IANB anesthesia, although without consistently achieving profound anesthesia [18]. Premedication with NSAIDs or corticosteroids, particularly ibuprofen and dexamethasone, may improve IANB efficacy in symptomatic irreversible pulpitis by increasing anesthetic success and decreasing intraoperative pain [19].

Preoperative use of ibuprofen, ketorolac, etodolac combined with acetaminophen, or aceclofenac combined with acetaminophen improved IANB efficacy in teeth with irreversible pulpitis, although the between-group differences did not reach statistical significance [20].

5.2. Variation in the evidence and limits of generalization

By contrast, anesthetic success did not differ significantly between ibuprofen and lornoxicam premedication in patients with acute irreversible pulpitis affecting mandibular posterior teeth [21]. Likewise, ketorolac, dexamethasone, or prednisolone administered before treatment may improve IANB efficacy in mandibular molars with symptomatic irreversible pulpitis, but no statistically significant differences were detected among the three drugs [22]. Oral premedication with dexamethasone, NSAIDs (ketorolac, piroxicam, ibuprofen plus acetaminophen), or tramadol has also been reported to significantly increase anesthetic success [23]. Current evidence also supports systemic premedication with NSAIDs, including ibuprofen at doses above 400 mg or ketorolac 10–20 mg, and with corticosteroids such as dexamethasone 0.5 mg, as possible methods of improving IANB success in irreversible pulpitis [24]. Several studies have found that preoperative ibuprofen or ketorolac does not significantly improve IANB efficacy in patients with irreversible pulpitis [25,26].

Overall, NSAID premedication appears to improve the chance of IANB success in symptomatic irreversible pulpitis. Nevertheless, differences between the studies and the variable methodological quality of previous systematic reviews do not allow a universal protocol to be recommended [6].

5.3. NSAID premedication and the need for supplemental anesthesia

For mandibular molars with symptomatic irreversible pulpitis in which the primary IANB fails, a supplemental intraligamentary injection of 4% articaine with 1:100,000 epinephrine may significantly enhance anesthesia. In addition, preoperative aceclofenac 100 mg produced a numerical im-

provement in anesthetic efficacy compared with placebo, although this difference was not statistically significant [27]. In children aged 5–9 years with irreversible pulpitis, oral ibuprofen has also been reported to improve the success of lidocaine IANB [28]. Premedication with an NSAID should therefore be considered an adjunct to anesthetic management and not a substitute for it [6,27].

6. NSAIDS AFTER NONSURGICAL ENDODONTIC TREATMENT

Postoperative pain is an expected consequence of some dental procedures and has been reported in 25%-40% of endodontic patients [29]. Although this pain may not indicate endodontic failure, its relief is significant for the patient who may worry in this case about the success of the treatment. Pain generally peaks during the first 48 hours and then gradually diminishes, usually resolving within 7-10 days [30,31]. Variants in the *COX-2* gene have also been found to be associated with endodontic pain after treatment [32]. NSAIDs seem to be the primary medication choice for managing postoperative pain in endodontic procedures [33].

6.1. Early postoperative pain: 6–8 h

There is limited to moderate evidence supporting the effectiveness of NSAIDs, either alone or in combination with acetaminophen, when administered postoperatively in cases of irreversible pulpitis or pulp necrosis [7].

Generally, endodontic pain after treatment does not last long, so evidence at particular times is much more helpful than simply saying an analgesic 'worked.' In 2020, a network meta-analysis including 11 trials considered eight categories of interventions. At 6–8 hours after initiation of nonsurgical treatment, NSAID-acetaminophen combinations and NSAIDs provided benefits relative to placebo for pain [7]. Levels of certainty for the estimates of early pain varied from very low to moderate.

A 2026 systematic review included ten randomized clinical trials, although only five trials with a total of 347 participants were included in the meta-analysis. Diclofenac-acetaminophen showed the highest ranking for pain relief during the first 6–8 hours. However, because the pooled sample was small, this finding should be interpreted with caution and does not establish a preferred regimen for all patients [34]. Another study reported that ketorolac reduced post-treatment pain after root canal obturation in patients with pulpitis and periodontitis, with no significant adverse effects in the study population [35].

6.2. Analgesia during 12–24 h

At 12–24 hours, the same network meta-analysis found that NSAIDs were the only intervention that continued to provide a substantial analgesic benefit [7]. The analysis also found that NSAIDs or NSAID–acetaminophen combinations produced a clinically significant reduction in acute postoperative pain in patients with irreversible pulpitis or pulpal necrosis, whereas corticosteroids and opioids did not show a significant reduction in postoperative pain in the network comparison [7].

6.3. Persistent pain at or beyond 48 h

At 48 hours, however, the network meta-analysis did not show a significant benefit for any of the interventions studied [7]. Pain that continues or becomes more severe at this stage should be interpreted in the context of the original diagnosis, the endodontic treatment already carried out, and the subsequent clinical findings rather than by simply extending analgesic treatment [7,36].

6.4. NSAID monotherapy *versus* combination therapy

A 2017 systematic review found that NSAIDs were effective in reducing pain when compared to a placebo and concluded that postoperative endodontic pain may be managed with NSAIDs and/or acetaminophen [37]. Ibuprofen 600 mg, either alone or in combination with acetaminophen 1000 mg, was reported to be significantly more effective than placebo when pain was assessed 6 hours after endodontic treatment [38].

Another report found that ibuprofen 600 mg combined with acetaminophen 1000 mg was superior to placebo, but not significantly more effective than ibuprofen 600 mg alone, 6 hours after root canal obturation. Accordingly, available evidence is insufficient to identify the optimal NSAID, dosing schedule, or administration interval for sustained pain control in patients who present with preoperative pain [39]. It has also been reported that the combination of ibuprofen/ acetaminophen, taken immediately after initial root canal preparation in teeth with irreversible pulpitis, reduces post-endodontic pain [40].

Alprazolam has been reported to enhance the analgesic effect of ibuprofen in post-endodontic pain, although this represents isolated evidence and does not establish a standard analgesic strategy [41]. NSAIDs and corticosteroids have both

been reported to reduce pain following nonsurgical endodontic treatment [42] and in symptomatic irreversible pulpitis, NSAIDs may provide more rapid early pain relief, while corticosteroids may provide a more sustained analgesic effect [43].

6.5. Influence of diagnosis and treatment context

Root canal treatment is frequently completed in a single visit. Administration of ibuprofen 600 mg one hour before a single-visit procedure has been reported to reduce postoperative pain and subsequent analgesic consumption in patients with symptomatic irreversible pulpitis [44]. For treatment completed over multiple visits, no difference was reported between ibuprofen alone and ibuprofen combined with acetaminophen in reducing postoperative pain after endodontic debridement in patients with symptomatic irreversible pulpitis and symptomatic apical periodontitis [45]. Another study reported that ibuprofen 400 mg administered 45 min before endodontic treatment significantly reduced intraoperative pain in mandibular first and second molars with symptomatic irreversible pulpitis and apical periodontitis [46].

6.6. Clinical interpretation

NSAIDs, either alone or in combination with acetaminophen, appear to be useful for short-term relief of postoperative pain in patients without contraindications. There is insufficient evidence to identify one combination or dose as the best choice for every patient or at every time point and it would, therefore, be inaccurate to claim that no postoperative data are available or to present an individual combination and dose as optimal [7,34]. A summary of the clinical evidence regarding NSAID use before and after endodontic treatment is provided in Table 1 and the comparative evidence in Table 2.

Table 1. Summary of clinical evidence regarding NSAID use across endodontic treatment phases.

Clinical scenario	Evidence summary	Clinical interpretation
Before treatment (premedication)	Evidence syntheses suggest that oral NSAID premedication can increase IANB success in symptomatic irreversible pulpitis, particularly in mandibular molars. Studied agents include ibuprofen, ketorolac, diclofenac, meloxicam, and aceclofenac [6,11-16,18-24,28].	NSAIDs may be used as an adjunct to the anesthetic strategy; heterogeneity in agents, doses, populations, and definitions of success precludes a universal regimen.
Primary IANB inadequate	Premedication with an NSAID should therefore be considered an adjunct to anesthetic management and not a substitute for it.	When the primary IANB is inadequate, an appropriate supplemental local anesthetic technique should be used [6,27].
After treatment 6–8 h	NSAIDs and NSAID–acetaminophen combinations demonstrate benefit relative to placebo during the early postoperative period [7,34,35,37-42].	The clearest postoperative evidence supports early, short-term pain relief.
After treatment 12–24 h	NSAIDs remain beneficial at 12–24 h in the network meta-analysis [7].	Short-term analgesic benefit may continue through the first 24 h.
After treatment ≥48 h	At 48 h, the network meta-analysis did not identify a statistically significant benefit for the evaluated interventions [7].	Sustained analgesic benefit beyond the early postoperative period is not clearly established.
After treatment regimen selection	Ibuprofen alone and ibuprofen–acetaminophen combinations are frequently studied. Recent analyses also include diclofenac–acetaminophen and naproxen, but comparative rankings remain provisional [34,38,39].	No single best postoperative NSAID or combination regimen can presently be endorsed for all patients.

Clinical scenario	Evidence summary	Clinical interpretation
Individual patient selection	The decision should include consideration of the patient's current medication and relevant gastrointestinal, renal, cardiovascular, hepatic, and bleeding risks, together with allergy history and pregnancy status where relevant.	The choice of drug, dose, route, and duration should therefore be made for the individual patient rather than used as a non-specific prescription [9,51,52].

Table abbreviations**:** IANB, inferior alveolar nerve block; NSAID, non-steroidal anti-inflammatory drug.

Table 2. Comparative evidence relevant to NSAID premedication and postoperative analgesia.

Clinical question	Comparison or evidence base	Reported finding	Interpretation / limitation
Standard IANB in symptomatic irreversible pulpitis	NSAID regimens *versus* comparators; 12 reviews synthesized in an umbrella review [6]	Generally favorable findings for several NSAIDs, alone or with acetaminophen	AMSTAR 2 ratings ranged from very low to high; applies to studied mandibular molars and standard IANB
Standard IANB: conflicting trials	Preoperative ibuprofen or ketorolac *versus* controls [25,26]	No statistically significant improvement in anesthetic success in these trials	Individual negative trials qualify the favorable pooled findings
Head-to-head premedication	Ibuprofen *versus* lornoxicam [21]; ketorolac *versus* dexamethasone or prednisolone [22]	No statistically significant differences between the compared active regimens	Lack of a between-drug difference does not establish equivalence or superiority
Failed primary IANB	Supplemental 4% articaine *versus* 3% plain mepivacaine, with or without aceclofenac 100 mg [27]	Articaine achieved greater anesthetic success; aceclofenac showed a nonsignificant numerical benefit	Supplemental-injection outcomes cannot be generalized to primary IANB alone
Postoperative pain: 6–8 h	NSAIDs and NSAID–acetaminophen regimens *versus* placebo; network meta-analysis [7]	Analgesic benefit during the early postoperative period	Certainty for early pain estimates varied from very low to moderate
Postoperative pain: 12–48 h	Interventions compared in the same network meta-analysis [7]	NSAIDs retained benefit at 12–24 h; no intervention showed significant benefit at 48 h	Findings depend on the assessed postoperative time point
Postoperative combination *versus* monotherapy	Ibuprofen 600 mg with or without acetaminophen 1000 mg [39]	Combination outperformed placebo but not ibuprofen alone at 6 h	Does not establish the optimal regimen for all patients
Early postoperative ranking	Ten trials in a 2026 review; five trials (347 participants) meta-analyzed [34]	Diclofenac–acetaminophen had the highest ranking for pain relief at 6–8 h	Small pooled sample limits confidence in treatment rankings

7. SELECTING NSAIDS FOR THE INDIVIDUAL PATIENT

Pain management remains a significant challenge in dental care, and NSAIDs are often prescribed before and/or after endodontic treatment for pain relief. They may also be prescribed after adequate root canal treatment when their use is not always justified. Prolonged systemic administration of NSAIDs has been associated with an increased risk of adverse events, and increased mortality has been reported in some populations with NSAID-re-

lated complications [47-50]. In endodontic practice the period of administration is usually short. Nevertheless, unnecessary repeated or prolonged use should be avoided, and contraindications, drug interactions, and individual patient risks remain important even when treatment is of short duration. NSAIDs can cause several adverse effects. Minor reactions include nausea, vomiting, diarrhea, dizziness, and headache, while more serious complications include prolonged postoperative bleeding, kidney failure, and gastrointestinal or cardiovascular adverse effects [51]. Because of these possible complications, NSAIDs should be prescribed at the minimum effective dose and for the shortest necessary period [4,9,51].

The decision should include consideration of the patient's current medication and relevant gastrointestinal, renal, cardiovascular, hepatic, and bleeding risks, together with allergy history and pregnancy status where relevant. The choice of drug, dose, route, and duration should therefore be made for the individual patient rather than used as a non-specific prescription [9,51,52].

Particular caution is required in patients with gastrointestinal, renal, cardiovascular, hepatic, or bleeding disorders, as NSAIDs may exacerbate underlying disease or increase the risk of adverse events [9,51,52]. In addition, concomitant alcohol consumption may further increase the risk of gastrointestinal irritation and bleeding [53]. Nevertheless, the proper execution of endodontic procedures remains the most critical factor in preventing and managing pain of endodontic origin [1].

8. DISCUSSION

This section considers how the evidence can be applied to common clinical situations. It is intended to support clinical judgment and not to replace practice guidelines or review of the individual patient's medication. Figure 1 summarizes the clinical decision pathway for NSAID use in endodontic pain management.

8.1. Before treatment

In a patient with symptomatic irreversible pulpitis where difficulty with IANB is anticipated, a preoperative NSAID may be considered if there is no contraindication. The clinician should still plan for the possibility that supplemental anesthesia will be required [6]. When postoperative pain is expected, analgesic treatment should be planned for the short term, since the clearest evidence of benefit is seen during the first 6–24 hours and not beyond 48 hours [7].

8.2. During treatment

When satisfactory anesthesia has not been obtained, a supplemental anesthetic technique should be used when necessary. Previous NSAID premedication does not alter this requirement and should not delay the use of additional local anesthesia [6,27].

8.3. After treatment

Patients should be informed that analgesics may reduce pain during the early period after treatment but may not eliminate all discomfort. The presence or absence of pain alone does not establish whether treatment has been successful. The measurable benefit of medication in the available evidence is mainly early and short-term [7,36].

8.4. Persistent symptoms and clinical reassessment

Pain that persists or increases, particularly when swelling or systemic symptoms are present, requires clinical reassessment rather than repeated or prolonged analgesic use [7,36]. Any additional endodontic treatment should then be determined by the diagnosis and clinical findings, not simply by whether the symptoms have responded to medication [1,36].

8.5. Limitations of the evidence and future research

The main uncertainty is not whether NSAIDs can provide analgesia, but which regimen is most appropriate for a particular patient and endodontic condition. Future trials should use clearly defined diagnostic criteria and report tooth type, anesthetic technique, timing of medication, adverse events, and the criteria used to define anesthetic success. Postoperative studies should record pain and rescue-medication use at comparable time points and distinguish between pulpal and periapical diagnoses. Larger studies are also needed to compare treatment strategies rather than only individual drugs with placebo. The small number of patients included in the most recent single-dose meta-analysis illustrates why comparative rankings remain uncertain [34].

Results should also be reported in relation to the level of pain before treatment, the stage at which treatment was carried out, and the need for supplemental anesthesia. It is also important to distinguish completed root canal treatment from

debridement or interappointment care. Without this information, it remains difficult to decide how the results of a drug comparison should be applied to an individual endodontic patient [6,7,34].

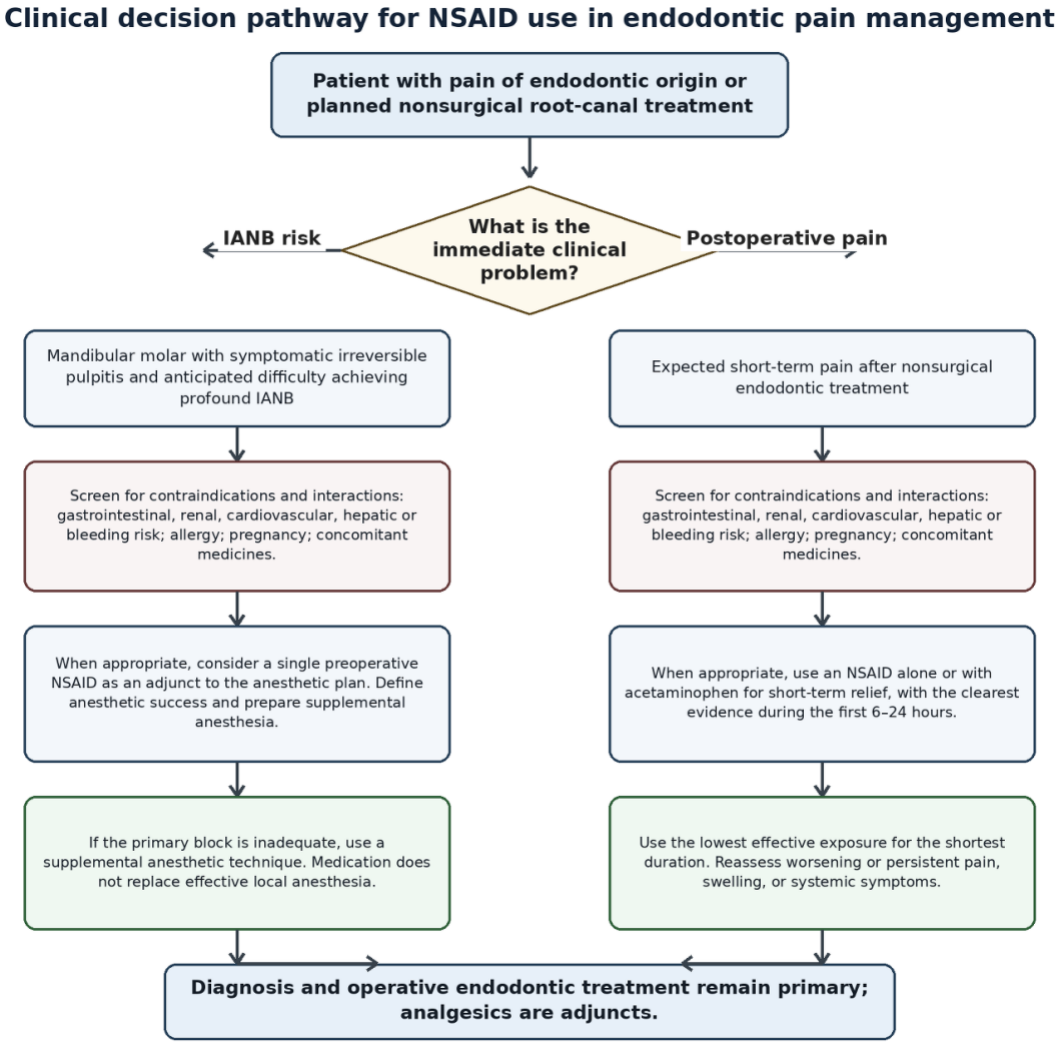


Figure 1. Clinical decision pathway for NSAID use before, during, and after nonsurgical endodontic treatment. IANB, inferior alveolar nerve block; NSAID, non-steroidal anti-inflammatory drug.

9. CONCLUSION

The available evidence supports two main uses of NSAIDs in endodontic pain management. In symptomatic irreversible pulpitis, preoperative NSAID medication may improve IANB success in mandibular molars, although the quality of the evidence varies and a single regimen cannot be recommended [6]. After nonsurgical endodontic treatment, NSAIDs alone or combined with acetaminophen appear to be effective mainly during the first 6–24 hours. Evidence for longer-lasting pain relief is less clear, and no one postoperative regimen can presently be considered superior [7,34]. NSAIDs should therefore remain adjuncts to endodontic treatment and should be selected according to the indication, expected benefit, patient-related risks, and anticipated duration of use.

When the available evidence is considered in relation to endodontic treatment, the usefulness of an NSAID depends on the clinical reason for giving it. Before treatment, it may reduce inflammatory pain and may improve anesthetic success in some patients, although medication already taken by the

patient can also influence diagnostic responses. Pain that persists or becomes more severe should prompt reassessment of the tooth and the treatment rather than routine continuation of medication. NSAIDs therefore have a useful but supporting role in endodontic care; diagnosis and appropriate operative treatment remain the main basis for successful pain management [1,6,7,10,36].

ADDITIONAL INFORMATION

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The authors declare no conflicts of interest.

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