

Root Canal Treatment: Does One Visit Really Compare to Two?

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Postoperative pain following root canal procedures remains a persistent challenge for patients and clinicians alike. The debate over whether a single-visit or multiple-visit approach offers superior outcomes, particularly regarding pain control, has continued for years. Recent evidence, including an umbrella review published in *J Dent*, now provides a clearer picture.

KEY TAKEAWAYS

- **The Pivot:** Single-visit root canal therapy is equivalent to multiple-visit protocols for postoperative pain and complications.
- **The Data:** Visual Analog Scale (VAS) pain scores showed no significant differences between groups at any interval.
- **The Action:** Clinicians can confidently offer single-visit root canal treatment as a time-efficient option without compromising patient comfort or safety.

Root canal treatment, or endodontic therapy, aims to remove infected or damaged pulp from a tooth, clean and shape the root canals, and then fill and seal the space. This procedure is critical for alleviating pain and saving teeth that would otherwise require extraction. But the process itself can induce postoperative discomfort, leading to ongoing discussions about the most effective treatment regimen to minimize this pain. The primary question has been whether completing the entire procedure in one appointment, or splitting it across two or more visits, impacts patient experience, particularly concerning pain and complications.^{1,2,3}

Three recent publications, two randomized clinical trials and an umbrella review, directly address this clinical tension. Bhardwaj, Koushik, and Khekade, writing in *Bioinformation* in 2026, conducted a randomized clinical trial comparing single-visit (n=60) versus multiple-visit (n=60) root canal treatments.¹ Karade, Marwaha, and Jadhav published a similar trial in *Bioinformation* in 2025, also with 60 patients in each arm.² These trials focused specifically on mandibular molars presenting with symptomatic irreversible pulpitis, a common and often acutely painful indication for root canal therapy. Both studies used standardized rotary instrumentation for canal preparation and warm vertical obturation for filling, ensuring consistency in technique across treatment groups.^{1,2}

Comparing Pain and Complications

The core outcome measured in both randomized trials was postoperative pain, assessed using Visual Analog Scale (VAS) measurements. The Bhardwaj trial found similar pain trends across both single-visit and multiple-visit groups. Pain scores peaked at 6-12 hours postoperatively in both cohorts, but the investigators observed no significant differences in

pain scores at any measured interval between the two treatment approaches.¹ Karade and colleagues reported identical findings, with no significant differences in VAS scores between single-visit and multiple-visit groups at any time point.² This consistency across two independent trials strengthens the conclusion that the number of visits does not dictate the intensity or duration of immediate postoperative pain.

Beyond pain, the trials also evaluated other critical postoperative outcomes. Both studies reported comparable rates of flare-ups, swelling, and analgesic intake between the single-visit and multiple-visit groups.^{1,2} Flare-ups, defined as acute exacerbations of pain or swelling requiring unscheduled intervention, are a significant concern for both patients and clinicians. The equivalent rates of these complications demonstrate that single-visit therapy maintains a safety profile comparable to its multiple-visit counterpart. Patients in both groups consumed similar amounts of analgesics, further reinforcing the idea that neither approach inherently leads to greater discomfort requiring more medication.^{1,2}

The umbrella review by Gupta, Abraham, and Ahmad, published in J Dent in 2026, synthesized evidence from multiple studies on this topic.³ While the abstract of this review mirrors the findings of the individual trials, its nature as an umbrella review implies a broader synthesis of existing literature. This type of review typically examines systematic reviews and meta-analyses, providing a higher level of evidence. The consistent message across these three publications, two primary randomized trials and one umbrella review, is that single-visit root canal therapy is a time-efficient alternative that maintains comparable postoperative pain control and complication rates to multiple-visit protocols.^{1,2,3} This convergence of evidence from different study types provides a robust argument for the equivalence of these two approaches.

The Clinical Rationale for Single-Visit Treatment

The rationale for single-visit root canal treatment centers on patient convenience and chair time efficiency. Completing the procedure in one appointment reduces the number of trips to the dental office, which can be particularly beneficial for patients with busy schedules, those traveling long distances, or individuals with dental anxiety. It also minimizes the risk of inter-appointment contamination, where the temporarily sealed tooth might become re-infected between visits. The use of standardized rotary instrumentation and warm vertical obturation in these trials reflects modern endodontic practice, which has significantly improved the predictability and success rates of root canal procedures. Rotary instruments allow for more efficient and precise canal shaping, while warm vertical obturation ensures a dense, three-dimensional seal of the root canal system, reducing the likelihood of bacterial leakage and subsequent infection. These advancements contribute to the high success rates observed with both single- and multiple-visit approaches. For a deeper dive into managing complex pain, consider new mechanisms for neuropathic pain, which often presents alongside dental issues. Still, some clinicians have historically favored multiple-visit treatments, particularly for cases with significant infection or necrosis. The argument often revolved around the perceived need for intracanal medicaments, such as calcium hydroxide, to disinfect the canal between appointments. The idea was that these medicaments would reduce bacterial load more effectively, thereby minimizing postoperative pain and improving long-term outcomes. But the current evidence from these trials and the umbrella review indicates that, at least for symptomatic irreversible pulpitis in mandibular molars, the additional visit and inter-appointment medication do not confer a measurable advantage in terms of pain or complications. This suggests that the mechanical debridement and thorough obturation achieved in a single visit are sufficient for effective treatment in these cases. The Oxford Handbook of General Practice, 5th Edition offers a concise overview of such common clinical dilemmas.

Where the Evidence Falls Short

While the findings are consistent, the trials focused specifically on mandibular molars with symptomatic irreversible pulpitis. This narrow patient population means the results may not be generalizable to all teeth (e.g., maxillary molars, anterior teeth, or premolars) or all pulpal diagnoses (e.g., asymptomatic apical periodontitis, retreatment cases, or teeth with extensive periapical lesions). Different tooth anatomies and varying degrees of infection could potentially alter the pain and complication profiles of single-visit versus multiple-visit approaches. The sample size of 60 patients per group in the individual trials, while adequate for detecting differences in pain scores, might be underpowered to detect rare but serious complications. Larger, multicenter trials across a broader range of clinical scenarios would provide more comprehensive data.

Another consideration is the subjective nature of pain assessment. While VAS scales are widely used and validated, individual pain perception can vary significantly. The studies did not examine patient-reported quality of life or long-term tooth survival rates, which are also important metrics for evaluating treatment success. The follow-up periods for assessing postoperative pain were relatively short, typically extending only a few days or weeks. Longer-term follow-up would be necessary to confirm the equivalence of flare-up rates and overall success over months or years. These studies also did not explicitly detail the experience level of the operators, which can influence treatment outcomes, especially in complex endodontic procedures. The standardization of technique helps mitigate this, but operator skill remains a factor. For more on pain assessment, our coverage on neuropathic pain screening tools highlights the complexities involved. The umbrella review, while providing a high level of evidence, relies on the quality of the underlying systematic reviews and meta-analyses. If those reviews included studies with methodological flaws or biases, these limitations would

propagate into the umbrella review's conclusions. The abstracts provided for all three papers are remarkably similar, raising questions about potential overlap or shared authorship, which could introduce a degree of publication bias if they are not truly independent investigations. But, assuming they represent distinct contributions, the consistent message is compelling. The evidence supports single-visit therapy as a viable and equally effective option for the specified patient group.

CLINICAL IMPLICATIONS

The consistent data from these trials and the umbrella review should put to rest much of the debate surrounding single-visit versus multiple-visit root canal treatment for mandibular molars with symptomatic irreversible pulpitis. Clinicians can confidently offer single-visit therapy, knowing it does not increase postoperative pain or complication rates. This is a clear win for patient convenience and practice efficiency. For patients, the ability to complete a root canal in a single appointment means less time away from work or other commitments, and potentially less anxiety associated with multiple dental visits. This could improve treatment acceptance and adherence, ultimately leading to better oral health outcomes. The equivalence in pain and flare-up rates means patients are not sacrificing comfort for convenience.

The implications for practice management are also significant. Single-visit procedures free up chair time, allowing practices to see more patients or allocate resources to other complex cases. This efficiency can be particularly valuable in busy general practices or specialist endodontic clinics. The evidence supports streamlining workflows without compromising clinical standards.

EDITORIAL & AI STANDARDS

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