

## Comparative Effectiveness of Single-Visit Versus Multiple-Visit Root Canal Therapy: An Extensive Review

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**Citation:** Ajayi T, Comparative Effectiveness of Single-Visit Versus Multiple-Visit Root Canal Therapy: An Extensive Review. *J Oral Med and Dent Res.* 5(3):1-4.

**Received:** July 13, 2024 | **Published:** July 23, 2024

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### Abstract

Root canal therapy (RCT) is a crucial procedure in endodontics aimed at treating pulp and periapical diseases. A significant point of contention in endodontic treatment protocols is whether single-visit or multiple-visit RCT yields better outcomes. This review aims to comprehensively compare these two approaches, analyzing their impact on clinical success rates, microbial eradication, post-operative pain, and patient satisfaction.

### Keywords

Root Canal Therapy; Microbiological; Bacterial

## Introduction

Root canal therapy (RCT) is a crucial procedure in endodontics aimed at treating pulp and periapical diseases. A significant point of contention in endodontic treatment protocols is whether single-visit or multiple-visit RCT yields better outcomes. This review aims to comprehensively compare these two approaches, analyzing their impact on clinical success rates, microbial eradication, post-operative pain, and patient satisfaction.

## Methodology

This review synthesizes data from 20 studies, including randomized controlled trials (RCTs), systematic reviews, meta-analyses, and observational studies. The selected articles compare single-visit and multiple-visit RCT across various dimensions, such as microbiological outcomes, healing rates, patient-reported pain, and procedural complications.

## Healing Rates and Clinical Success

Multiple studies, including those by [1]. and [2]. demonstrated no significant difference in healing rates between single-visit and multiple-visit RCT [3]. In a Cochrane review, reinforced that both treatment modalities are equally effective concerning long-term clinical success. Performed a systematic review and meta-analysis on the effectiveness of single versus multiple-visit endodontic treatments for teeth with apical periodontitis. They concluded that both approaches showed similar healing rates. Conducted a randomized controlled trial with a one-year follow-up, confirming that single-visit RCT is as effective as multiple-visit RCT for necrotic teeth with apical periodontitis.

## Post-Operative Pain

The occurrence and severity of post-operative pain are critical factors influencing patient satisfaction and compliance. Research by [4] and [5]. Showed varied results regarding post-operative pain, with some studies reporting lower pain levels in single-visit treatments, while others found no significant difference. Conducted a systematic review, revealing that while single-visit treatments might cause less immediate post-operative pain, the difference is not statistically significant when compared to multiple-visit treatments. Performed a randomized controlled trial that supported these findings, suggesting that postoperative pain is influenced by factors beyond the number of visits, such as the initial infection status and the patient's pain threshold.

## Complications and Flare-Ups

Interappointment flare-ups, characterized by acute exacerbations of symptoms between treatment visits, are a significant concern in multiple-visit RCT. Noted a higher incidence of flare-ups in multiple-visit treatments, possibly due to the potential for canal contamination between appointments [6]. Argued that single-visit RCT minimizes the risk of such complications by completing the treatment in one session, reducing exposure to potential pathogens [7]. Conducted a prospective study on interappointment flare-ups, concluding that the extended treatment duration in multiple-visit RCTs increases the risk of flare-ups. Provided evidence that completing RCT in a single visit reduces the incidence of flare-ups and other complications associated with prolonged treatment.

## Patient Preferences and Satisfaction

Patient convenience and preference are critical in choosing between single-visit and multiple-visit RCT. Studies by [8] and [9] Indicated a general preference for single-visit treatments due to the reduced number of appointments, lower overall treatment time, and associated cost savings. Found that patients favored single-visit treatments for their convenience, as fewer visits translate to less time off work or daily activities. Supported this, noting that patient satisfaction is higher with single-visit RCT, primarily due to the reduced treatment duration and immediate completion of therapy.

## Discussion

The comparative analysis of single-visit and multiple-visit RCT reveals that both approaches offer similar clinical success rates and effectiveness in microbial eradication. Single-visit RCT provides advantages in terms of patient convenience, reduced treatment duration, and potentially lower costs. However, multiple-visit RCT allows for interim microbial control with intracanal medicaments, which might benefit certain complex cases.

## Conclusion

Current evidence suggests that both single-visit and multiple-visit root canal therapies are effective and viable options for treating endodontic infections. The choice of treatment should be tailored to individual patient needs, case complexity, and the clinician's expertise. Future research should focus on refining treatment protocols and understanding patient-specific factors that influence outcomes.

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