



Title **Methods of Diagnosis and Treatment in Endodontics
- A Systematic Review of the Literature**

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Reference Report no: 203. ISBN 978-91-85413-39-3, ISSN 1400-1403.
www.sbu.se/sv/Publicerat/Gul/Rotfyllning/

Aim

To address several specific questions, including:

- How well can different diagnostic methods determine the condition of pulp in teeth with different types of injury (eg, caries, trauma)?
- How well can different radiographic methods demonstrate bone loss at the root apex?
- Are there effective methods to treat pulpal inflammation to preserve pulp?
- How effective are different treatments when the pulp is necrotic?
- How effective are orthograde and retrograde treatments of root filled teeth showing signs of periapical inflammation?
- What serious side effects are associated with root canal therapy?
- Which methods are most cost effective in diagnosing and treating diseases in dental pulp?

Conclusions and results

- It is not possible to determine which diagnostic methods disclose whether vital but injured pulp can be maintained without root filling.
- The effects of different methods of instrumentation, disinfection, and root filling in root canal therapy are insufficiently studied.
- An investigation of practice by Swedish dentists shows wide variation in treatments and materials (except in the use of engine-driven instrumentation).
- Prospective studies on root canal therapy need to show how teeth can be preserved without risk of recurrence of symptoms, periradicular inflammation, or tooth fracture.
- A national registry with quality indicators is needed for follow-up evaluation of pulpal and root canal treatments.

Methods

The conclusions are based solely on human studies restricted to randomized controlled trials, controlled clinical trials, and prospective cohort studies. Post-mortem studies were accepted to assess reliability of different radiographic methods to diagnose periapical bone lesions. Case reports were included on serious side effects and complications of root canal.

Further research/reviews required

Randomized studies and prospective observational studies with follow-up are needed to:

- evaluate diagnostic methods that can determine the condition of the pulp in teeth afflicted by deep caries, trauma, or other forms of injury
- determine the reliability of digital volume tomography (CBCT) in diagnosing changes in the periapical bone
- show whether pulp exposed by caries or other causes is best treated by measures to preserve the pulp, eg, pulp capping/partial pulpotomy
- improve knowledge of specific treatment factors that explain why many endodontic treatments do not achieve an optimal outcome
- investigate if modern techniques/instrumentation improve root canal outcomes
- study survival of root filled teeth and factors that influence loss of endodontically treated teeth
- investigate the risk of pain/swelling in teeth with persistent but asymptomatic periapical inflammation or risk that the area of periapical bone destruction will increase
- study the risk to general health from untreated periapical inflammatory processes.