

Root Canal Safety

The relationship between oral health and overall wellbeing is indisputable in both the healthcare and oral health care literature. Endodontics plays a critical role in maintaining optimal oral health by eliminating infection and pain and preserving our natural dentition.

If a patient is concerned about the safety of endodontic treatment, a key responsibility of any dentist is to reassure patients that their overall well-being is a top priority. The American Association of Endodontists website (www.aae.org) is the best place for anxious patients to obtain comprehensive information on the safety and efficacy of endodontics and root canal treatment.

While plenty of factual and reliable information is available online from the AAE and other resources, patients occasionally encounter misinformation and present to their dentist or endodontist with questions and concerns about the safety of endodontic treatment. The misinformation epidemic began in the early 1920s due to the long-since dispelled ‘focal infection theory’ proposed by Dr. Weston A. Price. Dr. Price presented research erroneously suggesting that bacteria trapped in dentinal tubules during root canal treatment could leak out of the tooth, thereby causing any type of degenerative systemic disease (e.g., arthritis; diseases of the kidney, heart, nervous, gastrointestinal, endocrine and other systems). This ‘focal infection theory’ gained traction before medicine understood the causes of such disease. This debunked theory unfortunately resurfaced with the 2019 release of the ‘Root Cause’ Netflix documentary. Since 2019, misinformation about root canal treatment has circulated widely on social media platforms, where unverified claims and sensationalized anecdotes have been misleading patients into avoiding evidence-based oral health care (Niazi et al., *J Transl Med*, 2025).

Dr. Price and some modern-day holistic (aka “biologic”) dentists are advocates of tooth extraction—the most traumatic dental procedure—over endodontic treatment. The ‘focal infection theory’ resulted in a frightening era of tooth extraction in the early 1900’s — both for purported treatment of systemic disease and as a prophylactic measure against future illnesses. Dr. Price’s research techniques were immediately criticized at the time they were published, and by the early 1930’s, several well-designed studies using more modern research techniques discredited his findings and the focal infection theory.

Decades of research have continued to contradict Dr. Price’s findings since then. In 1951, the Journal of the American Dental Association (JADA) published a special edition reviewing the scientific literature and shifted the standard of practice back to endodontic treatment for teeth with non-vital pulp in instances where the tooth could be saved. The JADA reviewed Dr. Price’s research techniques from the 1920s and noted that they lacked many vitally important aspects of standardized, modern scientific research, including absence of proper control groups and introduction of excessive doses of bacteria to the oral cavity.

More recent research continues to support the safety of dental treatment as it relates to overall systemic health. In 2007, the American Heart Association significantly revised its guidelines on the prevention of infective endocarditis, narrowing the indications for antibiotic prophylaxis to a small group of patients at highest cardiac risk. Antibiotic prophylaxis is now recommended only for certain high-risk individuals undergoing dental procedures that involve manipulation of gingival tissue, the periapical region of teeth, or perforation of the oral mucosa.

Emerging Evidence: Endodontic Treatment and Systemic Metabolic Health

In addition to being safe, emerging research suggests that successful endodontic treatment may be associated with favorable changes in systemic metabolic and inflammatory markers.

A landmark two-year longitudinal metabolic study (Zhang, Niazi et al., *J Transl Med*, 2025) demonstrated that successful root canal treatment in patients with infections were associated with significant improvements in glucose and lipid metabolism, as well as reductions in systemic inflammatory markers. The study followed 65 patients over two years and analyzed changes in their blood chemistry after root canal treatment. Researchers found significant changes in 24 of 44 measured blood metabolites, including lower levels of branched-chain amino acids (which are linked to insulin resistance), reduced blood sugar and pyruvate after two years, short-term decreases in cholesterol and fatty acids, and a gradual increase in tryptophan—a metabolite associated with protective cardiovascular effects.

These findings suggest that chronic apical periodontitis does not only affect the oral cavity but may also disrupt fundamental energy metabolic pathways through the tricarboxylic acid (TCA) cycle, elevating blood sugar, cholesterol, and systemic inflammation. In other words, a long-standing infection at the tip of a tooth's root may affect more than just the mouth. The researchers found it may interfere with the way the body produces and uses energy, while also contributing to higher blood sugar, increased cholesterol levels, and inflammation throughout the body.

Successful treatment of endodontic infection may help normalize certain metabolic and inflammatory markers; however, further research is needed to determine whether these biochemical changes translate into measurable reductions in cardiometabolic disease risk. (Zhang et al., *J Transl Med*, 2025; AAE, 2026).

These emerging data reinforce the position that root canal treatment is not merely a procedure to save a tooth but may also contribute to the reduction of systemic inflammatory burden associated with chronic oral infection. The World Health Organization has also recognized the broader connection between oral health and systemic disease, reinforcing the message: “No Health Without Oral Health.”

Decades of research contradict the beliefs of “focal infection” proponents; there is no valid, scientific evidence linking endodontically treated teeth and systemic disease.

Emerging metabolic research suggests that successful elimination of odontogenic infection may be associated with favorable systemic metabolic and inflammatory changes, including improved glucose regulation, lipid metabolism, and reduced inflammatory burden (Zhang et al., *J Transl Med*, 2025).

Yet some patients still hear about this long-dispelled theory and believe it.

Guidelines for Addressing Patient Concerns

Dentists are asked to use the following guidelines to address patients who inquire about a connection between root canal treatment and illness:

- Acknowledge the patient's concerns; stress that optimum health is the goal for every dental patient.
- Provide the patient with written information about endodontic treatment and discuss it. The AAE has a variety of patient education brochures available for purchase at www.aae.org/onlinestore.
- Provide the patient with information from the AAE website about common root canal myths: www.aae.org/patients/root-canal-treatment/myths-root-canals.
- Indicate that the patient is in control of their own decision to move forward with any dental procedure and reiterate a commitment to the highest quality dental care.

- Share with patients that emerging research suggests successful treatment of chronic dental infections may be associated with improvements in certain systemic inflammatory and metabolic markers, including better glucose regulation and reduced inflammation—reinforcing that endodontic treatment supports overall well-being (Zhang et al., *J Transl Med*, 2025).
- Caution patients about health misinformation on social media. Encourage them to verify the credentials of anyone providing dental health advice online, seek information from reputable scientific sources, and consult with a qualified dentist before making treatment decisions.

Interprofessional Collaboration: Dentistry and Medicine

As evidence continues to emerge linking chronic oral infections to systemic metabolic conditions, the AAE supports closer collaboration between dental and medical professionals.

Apical periodontitis—the condition treated by root canal treatment—is highly prevalent worldwide, with studies suggesting that approximately half of adults may have at least one tooth affected during their lifetime.

Its systemic effects, including elevated inflammatory biomarkers associated with cardiovascular disease risk, warrant recognition in general medical practice (Zhang et al., *J Transl Med*, 2025).

Root canal treatment remains the evidence-based solution for eliminating endodontic infection and preserving natural teeth. By resolving chronic oral infection, it may also reduce sources of systemic inflammatory burden.

Greater integration between medical and dental care may improve early detection and management of chronic inflammatory conditions that affect both oral and systemic health. For high-risk patients, seeing a dental team as early as possible for timely endodontic treatment can optimize oral health and reduce related systemic risks (AAE, 2026).

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New References Added in this Revision:

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Individual endodontists may deviate from this position statement when, in their sound dental judgement, the condition of the patient so requires.

Access additional resources at [aae.org](https://www.aae.org).

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