Preservation of the natural dentition is the primary goal of dentistry. Published surveys indicate that patients generally value preserving their teeth and desire to save their natural dentition in favor of extraction whenever possible. Significant technological and biological improvements have been realized by the introduction of new materials and techniques, and the field of endodontics has come into its own. This evolution has had profound effects on the practice of endodontics and the restoration of their oral health and function. It is essential to employ an evidence-based, interdisciplinary approach that addresses the interests of the patient when determining the best possible course of treatment.

In July 2014, the American Association of Endodontists, in collaboration with the American College of Prosthodontists and the American Academy of Periodontology, held a two-day Joint Symposium titled “Teeth for a Lifetime: Interdisciplinary Treatment Planning.” Approximately 375 general dentists and specialists assembled in Chicago to focus on preserving the natural dentition.

The educational program included evidence-based, periodontically and prosthodontically based presentations on modern endodontic treatments. Scott L. Doyle, DDS, was the moderator and was joined by Alan Guban, chair of the 2014 Joint Symposium Planning Committee, who introduced the concept of integrated care. Dental implants are one of the most significant advancements in contemporary dentistry. This innovation has had profound effects on endodontic, periodontic and prosthodontic treatment planning for the rehabilitation of edentulous spaces and for teeth with an compromised root structure.

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Treatment planning options A key focus of the Joint Symposium involved treatment planning decisions regarding endodontic treatment and implant therapy. Should a tooth with an advanced periodontal disease be retained with root canal treatment and restoration, or be extracted and replaced with a single-tooth implant supported restoration? This assessment involves a challenging and complex decision-making process that must be customized to suit the patient’s needs and desires.23,24 The topic has received considerable attention in the literature, the media and at dental education and continuing education conferences. Endodontic treatment and implant therapy should not be viewed as competing alternatives, rather as complementary treatment options for the appropriate patient situation. (Figs 1a, b) Endodontic treatment is indicated for restorable, periodontally sound teeth with an adequately aligned and apically pathosis. Endodontic treatment on teeth with nonrestorable crowns or teeth with severe periodontal co-conditions is contraindicated, and other options such as implant placement should be considered.25

When making treatment decisions, the clinician should consider factors including outcome assessment, local and systemic case-specific issues, cost, the patient’s desires and needs, esthetics, potential adverse outcomes and ethical factors.26,27 Outcome assessment: Success and survival Treatment outcomes play a key role in the assessment of different treatment options. Patients often ask whether a procedure is going to be successful or not. This question can be challenging for a clinician to answer due to the variety of reported outcomes in the literature.28 There are differences in methodology and criteria used to evaluate the outcomes for root canal treatment and implant prosthetics, which makes comparisons between success rates difficult, if not impossible.29 Endodontic studies have historically used “success” and “failure” as outcome measures and have focused on a strict combination of radiographic and clinical criteria.30 In contrast, the implant literature has primarily reported “survival,” i.e. the implant is either present or absent. Therefore, implant studies that solely evaluate survival as an outcome measure will likely publish higher success rates than endodontic studies that rely on biologic healing and factors related to the entire restored tooth. To establish more valid and favorable outcomes and patient experiences, another approach should be taken. Interdisciplinary care is important for the management of endodontically treated teeth. The restorative dentist plays a significant role in the outcome by providing an appropri- ate and timely restoration. Root canal treatment is not complete until the tooth is coronally sealed and restored to function. Multiple studies have demonstrated that a successful endodontic restoration has a significant impact on survival rates.31,32 Therefore, the likelihood of a favorable outcome increases with both skillful endodontic care and prompt restorative treatment (Figs 2a, b). Advances in technology aid in attaining high levels of tooth retention. The dental operating microscope, nickel–titanium instruments, apex locators, enhanced irrigation protocols and dentin preservation strategies are examples of improvements that allow clinicians to more predictably manage a greater range of treatment options. Advanced digital cone-beam computed tomography facilitates more accurate diagnosis and treatment planning.24,33

Comparative studies: Endodotically treated teeth and single-tooth implants A large number of reviews have addressed the relative survival rates of endodontically treated teeth and single-tooth implants. The Academy of Osseointegration conducted a me- ta-analysis using 13 studies (approximately 23,000 teeth) on pedo endodontically treated teeth and 57 studies (approximately 12,000 implants) on single-tooth implants. The outcome data demonstrated no difference between the two groups during any of the observation pe- riods.34 Another systematic review supported by the American Academy of Endodontists compared the outcomes of endodontically treated teeth with those of a single-tooth implant.35 One study used cone-beam computed tomography for an endodontically treated root channel and restorative canal.36 The data demonstrated that the survival rates of endodontically treated teeth and single-tooth implants were similar.37,38

Predictable tooth retention: Nonsurgical root canal treatment and restoration The majority of endodontic treat- ment is performed by general den- tists with a high degree of success.39 For complex cases, referral to an endodontist with additional training and expertise may result in more predictable outcomes and enhanced patient experiences.32,33Interdisciplinary care is important for the management of endodontically treated teeth. The restorative dentist plays a significant role in the outcome by providing an appropriate and timely restoration. Root canal treatment is not complete until the tooth is coronally sealed and restored to function. Multiple studies have demonstrated that a successful endodontic restoration has a significant impact on survival rates. Therefore, the likelihood of a favorable outcome increases with both skillful endodontic care and prompt restorative treatment.

Treatment planning: Retention of the natural dentition and the replacement of missing teeth The majority of endodontic treatment is performed by general dentists with a high degree of success.40 For complex cases, referral to an endodontist with additional training and expertise may result in more predictable outcomes and enhanced patient experiences.41 Interdisciplinary care is important for the management of endodontically treated teeth. The restorative dentist plays a significant role in the outcome by providing an appropriate and timely restoration. Root canal treatment is not complete until the tooth is coronally sealed and restored to function. Multiple studies have demonstrated that a successful endodontic restoration has a significant impact on survival rates.42 Therefore, the likelihood of a favorable outcome increases with both skillful endodontic care and prompt restorative treatment (Figs 2a, b).

Fig. 1b. Three-year recall image. The patient has benefited from both root canal treatment and implant therapy. Courtesy of Dr. Tyler Peterson and the University of Minnesota School of Dentistry.
In systemic and local factors, it is critical to include the patient’s concerns during treatment planning. Common patient-centered factors include costs, treatment time, duration of healing, and risk of infection. Endodontic failure may occur because of factors that may result in similar conditions as endodontically treated teeth. Additionally, the incidence of post-treatment complications can be influenced by several factors, such as patient’s medical history, age, and general health. Controlling for these factors can improve the outcome of endodontic treatment.

**Local factors**
- **Accuracy:** This includes the decision-making process and the use of advanced technologies such as cone-beam computed tomography (CBCT) and digital imaging.
- **Restorability assessment:** This includes the evaluation of the tooth’s anatomy and the adjacent structures to determine the feasibility of endodontic treatment.
- **Assessment of patient factors:** This includes the patient’s medical history, medication use, and any potential contraindications to endodontic treatment.

**Systemic factors**
- **Patient age:** Younger patients may have a higher incidence of endodontic failure due to the increased flexibility of the periodontal ligament.
- **Medical conditions:** Patients with diabetes or other chronic diseases may have a higher risk of endodontic failure due to changes in the immune system.
- **Drug use:** Certain medications, such as corticosteroids, may affect the healing of the periodontal ligament.

**Ethics and interdisciplinary consultation**
Clinicians are required to inform patients of all available treatment options, explain the risks and benefits of each option, and obtain informed consent before initiating treatment. If the patient does not agree, the treatment should be stopped.

**Conclusion**
- **Training and education:** Endodontists must be adequately trained and educated to perform endodontic procedures and treat patients with complex conditions.
- **Teamwork:** A multidisciplinary approach involving dental professionals and other healthcare providers can improve the success rate of endodontic treatment.
- **Patient education:** Patients must be educated about the risks and benefits of endodontic treatment, and informed consent must be obtained before proceeding.

This article is written by Dr. Robert S. Rain. It was originally published in *Endodontics & Periodontics* in 2015.