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## Healthy Metal

Long-Term Strategies for  
Dental Implant Maintenance

A chance tip from an orthopaedic surgeon who had been investigating new metals to use for hip joint prostheses reached the ears of Per-Ingvar Branemark in 1965. What the Swedish biomedical researcher learned about the metal—titanium—drove him to look more closely at how the material might be used to integrate with human bone for clinical use. Through experimentation, Branemark observed the unique way titanium integrated into living tissue, and he set a course to discover how the material could be used to reshape the state of dental prostheses.<sup>1</sup> Within two decades Branemark's vision of the modern dental implant took form and by 1982 the devices were placed for the first time in patients throughout the United States.

After nearly three decades dental implant placements in this country have soared to no less than 300,000 annually by at least one estimate.<sup>2</sup> Implant therapy is a growing practice but it is a long-term proposition hinged to successful maintenance programs. Recent research suggests there are key markers to help clinicians identify trouble signs for implant cases, and offers a new protocol for periimplantitis treatment.

### Even A Supertooth Has Its Kryptonite

Outcomes for implant placement in general are reported positively in the literature, with implant survival rates higher than 98% after 10 years.<sup>3</sup> As the figure indicates, however, not all of the procedures meet with long-term success.

Though dental implants themselves are strong as steel and immune to dental caries, the tissues that surround the devices are susceptible to biofilms and infection, which can threaten an implant's life span. Periimplantitis is a condition that causes inflammation in tissues around an implant and can threaten the success of an implant placement. Patients should be made aware from the onset of treatment that periodontal maintenance is key in reducing the potential for inflammatory complications to arise after the implant is placed.

### Potential for Trouble

Periimplantitis can be detected by recognizing many of the clues associated with inflammation in natural teeth: bleeding on probing, visible inflammation, and implant mobility. Radiographs can also help detect bone loss, though some degree of bone loss is considered normal for up to 5 years following the implant procedure.

When inflammation is found in the area surrounding a dental implant, clinicians may use conventional periodontal therapy and include efforts to improve the patient's compliance with his or her home-care hygiene program.<sup>4</sup> The critical nature of regular maintenance is underscored in a 2009 study of 1000 implant recipients that reported only 1 implant failure after osseointegration. The single failure, it was noted, occurred in study subject who had missed maintenance for 3 years.<sup>3</sup>

### **Who is at Risk?**

Incidences of periimplantitis occur in up to 16% of placements, especially in cases where a regular periodontal maintenance program is not followed.<sup>4</sup> Once longer-term studies of periimplantitis become available incidence rates may be shown higher than what is currently reported.<sup>4</sup>

Smokers and individuals who have a previous history of periodontitis exhibit higher rates of periimplantitis than non-smokers or patients who have never had periodontitis. Close monitoring and preventive hygiene are prescribed as the best options for long-term success against periimplantitis, which is a cause of higher implant failure rates among smokers.<sup>3</sup>

### **New Protocol for Periimplant Disease: CIST**

Cumulative intercept support therapy (CIST) has been suggested as a new approach to prevent and treat periimplant disease.<sup>5</sup> This method offers four treatment protocols—A, B, C, and D,—with each protocol designed to respond to an escalation in periimplant disease.

Protocol A calls for treatment that includes mild mechanical debridement, daily swabbing and a review of patient home care. This level of response is designed to control mild inflammation for implants that exhibit minimal increase in pocket depth, slight bleeding on probing, marginal erythema, and the presence of plaque and/or calculus.

Protocol B may be used when pocket depths reach up to 5 mm. Under these conditions the clinician should use all the elements of Protocol A and include a locally-delivered antibiotic.

Protocol C increases the level of therapy to address early periimplantitis, especially where pocket depths exceed 5 mm and bone loss has been detected. Protocol C calls for a systemic antibiotic therapy to be used in addition to procedures from protocols A and B.

Protocol D offers a response to frank periimplantitis and prescribes chemical disinfection via periodontal surgery and osseous resection. Protocol D also includes guided bone regeneration as a method to save the implant.

## More Function For More Folks

The integration of bone and titanium is the cornerstone of the process that allows dental implants to restore oral function without the slipping and clicking associated with dentures. This coexistence between living tissue and synthetic components is part of the philosophy that fueled Per-Ingvar Branemark to develop his dental implant. The advances that continue to be made in osseointegration technique for implants, Branemark notes in his research, are simply the result of efforts focused on “the patient.”<sup>6</sup>

The edentulous patient, Branemark has asserted, is an oral amputee deserving of every respect. He states that among older adults and middle-aged patients particularly, successful implant placements are determined by the quality of healing that occurs in implant-involved tissues and careful maintenance.

Branemark’s emphasis on these two points spotlights the important role of dental hygienists, who often drive the home-care programs that keep implants viable across the long-term. And, by stopping the inflammation caused by periimplant disease, dental hygienists assume an even greater role in patients’ larger general health picture by helping to close the circle on systemic diseases whose origins spring from inflammation in the oral cavity.

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