

# KEEPING YOU INFORMED

A publication of Dr. Richard Adams

## Evaluation & Assessment of Implants for Success and Failure 2008, Part I

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The growth in the placement and restoration of implants has created a need for reevaluation of the research, parameters and protocols utilized for evaluation and assessment of dental implants. Long term success rates are well documented. However, as the understanding and utilization of dental implants increases the potential for complications and long term maintenance challenges also increases. Now more than ever a true team approach is needed to be sure implant patients receive the best care.

The implant team may consist of oral surgeons, prosthodontists, general dentists, periodontists, dental assistants, dental hygienists, receptionists, laboratory technicians, physicians, etc. This cohesive group must work together for the best interest of the patient. There are numerous considerations when evaluating and assessing dental implants. Rather than finger pointing and responsibility shifting it should be the goal of all clinicians involved to understand and encourage strategies for long term implant success by the patient and all team members involved in patient care.

The findings of evaluation and assessment should be documented routinely in the patient record and shared with all members of the team (within HIPPA compliance). This article will highlight critical points for evaluation and assessment vis a vis dental implants.

**Soft Tissue:** Assessment of the soft tissue approximating an implant, implant abutment and restoration is an important portion of the re-care visit. Keratinized tissue is preferred at the perimucosal site. The color, surface texture, size, bleeding, and inflammation of the soft tissue should be assessed. Negative findings or changes from baselines should be investigated and appropriate action taken to avoid progression of problems.

**Bleeding:** There are fewer blood vessels around implants in comparison to around teeth. Bleeding alone is not the most reliable indicator of health/disease since impingement on well adapted perimucosal tissue and excessive probing pressure can give false positive results. The presence of plaque and/or ulcerated sulcular epithelium however is an indicator that a problem exists.

**Probing depth:** There can be many challenges when probing an implant sulcus. Since there is no connective tissue attachment zone around implants, the probe is in much closer contact to the bone. Probing force can penetrate the junctional epithelium. The standard safe pressure to probe an implant sulcus is 20 g. Plastic, pressure sensitive probes are the best tool to avoid altering the implant surface. It is not appropriate to traumatize the tissue to achieve six probing sites.

In many cases the prosthetic design makes it difficult if not impossible to get the probe parallel to the long axis of the implant. A fixed reference point should be utilized to eliminate inaccurate probing depths arising from gingival hyperplasia and hypertrophy. Dentate patients generally have deeper probing depths than edentulous patients. It is important to avoid introducing bacteria (seeding) into the sulcus around implants. Dipping the probe in chlorhexadine before usage in an implant sulcus site is recommended. As with teeth, pockets greater than 4 mm are very difficult for a patient to maintain.

Probing should be performed in the presence of bone loss (for monitoring purposes) or pathology. Probing can also give valuable information regarding tissue consistency, bleeding and/or exudate. In the first year following restoration in addition to safely probing all sites, clinicians should evaluate bleeding on probing, color, form, and consistency of the surrounding tissues. After one year of stable probing depths, probing can be restricted to facial and lingual surfaces and radiographs can be utilized to monitor mesial and distal bone levels. It is important to correlate any increased probing depth and bone loss.

**Mobility:** Mobile implants should not be restored. Often mobility of prosthesis or a prosthetic component can mimic implant mobility. Unlike teeth, mobility is a primary consideration to determine implant health and longevity. Since implants do not have a PDL and consequently act like an ankylosed tooth, absence of clinical mobility under load is an important criterion for success.

**Reference:** Implant Maintenance. In Misch, CE editor: *Contemporary Implant Dentistry 3rd Edition*, St. Louis, 2008, Mosby

## Part II: Radiographic Evaluation, Occlusion, Bone Loss, Peri-Implant Disease, and Implant Maintenance Appointments



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**Radiographic Evaluation:** It is often a challenge to expose a good clinical x-ray of an implant. Often the implant apex surpasses the apex of teeth. Film placement is hindered by muscle attachments and intraoral anatomy and can lead to foreshortened periapicals which serve no diagnostic value. To monitor crestal bone, vertical bitewings are the best choice. If a periapical is exposed, the apical region may be omitted to check crestal bone levels. If the x-ray clearly shows threads, the angulation was accurate. Any sign of blurry threads are not diagnostically acceptable to monitor crestal bone loss. The implant-abutment connection should appear as a clear line on a diagnostically acceptable radiograph. A radiolucency around the implant is indicative of soft tissue encapsulation due to infection, iatrogenic procedures, mobility or poor bone healing. The prognosis for these situations is poor. A radiolucency at the implant apex could be indicative of an alveolar perforation, use of a contaminated drill, overheating of the bone, infection, etc.

These conditions may be able to be treated with a surgical correction. Baseline radiographs should be taken the day of prosthesis delivery, 6 months post prosthesis delivery and one year post delivery. If there are no radiographic changes an x-ray should then be taken every three years. If there are signs of pathology, clinical symptoms, mobility or advanced bone loss, diagnosis and treatment should be initiated and an x-ray should be taken every six months for one year after the problem has ceased or been corrected.

**Occlusion:** Excessive stress or strain on a dental implant and restoration can cause bone loss, prosthetic complications and failure. With healthy dental implants there is usually an absence of pain under horizontal and vertical stress. Presence of pain could indicate tissue impingement, nerve impingement or mobility.

If a patient experiences sensitivity an evaluation of load and function is necessary. Occlusion and parafunctional habits may be to blame. There may be a need to add more implants or modify the prosthesis to correct the problem and eliminate the source of pain. Aggressive occlusal adjustments and/or occlusal splint therapy may be indicated. If the patient still experiences pain, the prognosis is usually poor and the patient should be questioned as to the severity of pain. If the pain is significant, the implant should be removed.

**Bone loss:** Evaluating crestal bone has become a hallmark of implant success. Evaluating bone depth with probing levels and radiographs poses a challenge with many clinicians. The distance between implant threads is generally 0.6 mm. This is a good radiographic marker since bone around implants is usually gauged in 0.5 mm increments. Early bone loss is usually a result of excessive stress. Immature bone near the crest can also be lost due to excessive stress, improper occlusion or parafunctional habits. Occlusal modifications and splints may be utilized. After an abutment is attached to an implant, 0.5 mm of connective tissue will form apical to the abutment/implant junction.

Research has also indicated the neck of the implant may also play a role in where bone remodels itself. Some research indicates that bone will reposition itself below smooth metal. Often presented and accepted there may be bone loss to the first thread of the implant within the first year of function. If yearly clinical assessments show bone loss in increments greater than 0.5 mm, there is a need for diagnosis, documentation and sometimes treatment. When a half of an implants height has bone loss that is considered a failure.

**Peri- Implant Disease:** The lack of a connective tissue barrier around implants creates a unique situation, lack of these fibers means bacteria have an easier path of entry to destroy bone. Periimplantitis is bone loss around an implant. The common etiology is stress and/or bacteria. If the bone loss is created by stress, there may be no bacteria present, but the pocket created can provide a perfect nidus for anaerobic bacteria which can be responsible for continued bone loss even if the stress is removed. The presence of exudate indicates some type of infection. Treatment with short term systemic antibiotics and topical chlorhexadine is the best initial approach. The FDA has not approved any of the site specific periodontal agents for use around dental implants. If the exudate is present for more than two weeks or frequently reoccurs, surgical correction may be necessary.

**Maintenance Appointments:** The role of the dental hygienist in implant care and maintenance is well defined. Evaluating and assessing the presence or lack of health is the first step in treating implant complications. Success comes from the interaction of many variables and a compliant patient. Surgical technique, good prosthetics, good oral hygiene and timely maintenance appointments enhance the success of dental implants.

Documentation is imperative to monitor progress and identify potential problems. Clinicians should continue to update their implant education regularly because advances in technology and research make implant dentistry very dynamic.

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