

# Quality Resource Guide

## Roles of the Hygienist and Dental Assistant in Dental Implant Maintenance

### Author Acknowledgements

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### Educational Objectives

Following this unit of instruction, the learner should be able to:

1. Describe the basic structure and anatomy of dental implants.
2. Discuss implant diseases and describe how maintenance helps prevent these diseases.
3. Identify three strategies for implant home care.
4. Describe in-office treatment for the maintenance of dental implants.
5. Outline the role dental assistants and dental hygienists play in dental implant maintenance.

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The following commentary highlights fundamental and commonly accepted practices on the subject matter. The information is intended as a general overview and is for educational purposes only. This information does not constitute legal advice, which can only be provided by an attorney.

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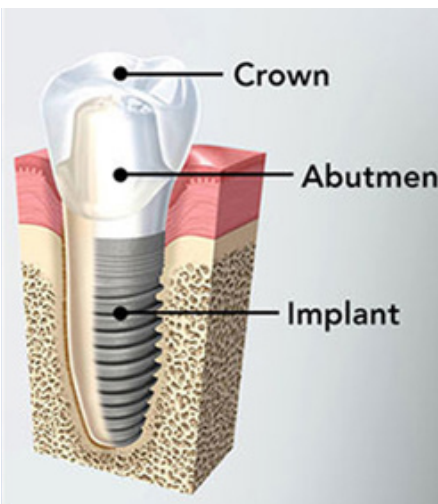
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## Introduction

Dental implants are a standard treatment option to replace missing teeth. Dental implants can replace a single tooth or a portion of the dentition.<sup>1</sup> Over the past twenty years, the use of dental implants has increased, and dental care providers are encountering the need for more dental implant maintenance procedures.<sup>2</sup> The dental hygienist and dental assistant are essential in providing dental implant maintenance.

Understanding dental implants basic structure and anatomy is essential to maintain them properly. Dental implants are non-biologic devices surgically placed into the bone to replace a missing tooth or support dental prostheses.<sup>3</sup> The implant comprises three parts; the implant body, the abutment post, and the crown or prosthesis (**Figure 1**). The implant body is placed in the bone while the abutment post extends through the gingival tissue and into the mouth. A screw or dental cement connects the crown or prosthesis to the abutment. Because the dental implant does not contain cementum like a natural tooth, the tissues surrounding the dental implant are somewhat different. The alveolar bone is in direct contact with the implant, and there are no periodontal fibers as there are with a natural tooth. The junctional epithelium, which connects to the tooth at the CEJ in a natural tooth, adheres to the implant or abutment surface, creating a biological

Figure 1 - Dental Implant



seal.<sup>3</sup> Because of these unique factors, dental implants require maintenance that addresses the specific needs of the surrounding tissues. Dental assistants and dental hygienists are often the oral health care providers that provide education and preventative treatment to patients with implants and therefore play an integral role in implant maintenance.

## Peri-Implant Health & Disease

Even though the surrounding tissue is different in dental implants, implants are still susceptible to disease. There are four classifications of peri-implant conditions:

- **Peri-implant health** is identified by an absence of erythema (redness), bleeding on probing (BOP), swelling, and suppuration. Healthy peri-implant tissue resembles healthy periodontal tissue.
- **Peri-implant mucositis** is a plaque biofilm-induced inflammation in the soft tissue with no bone loss. This condition reverses when etiologic factors such as plaque biofilm and calculus are removed. Peri-implant mucositis resembles gingivitis.
- **Peri-implantitis** is a plaque biofilm-induced inflammation affecting the soft and hard tissues surrounding an implant. Peri-implantitis is similar to chronic periodontitis and exhibits progressive loss of alveolar bone.
- **Hard and soft tissue deficiencies** may include resorption of bone and soft tissue recession. These can be caused by malpositioning of implants, thin, soft tissue, lack of keratinized tissue, or surgical trauma.<sup>4</sup>

Peri-implant mucositis and peri-implantitis can be prevented through proper home and professional care, with the dental assistant and dental hygienist playing vital roles in those areas.

## Recognizing Implant Disease and Risk Factors

Dental implant diseases are bacterial infections. Like gingivitis, peri-implant mucositis is caused by plaque biofilm accumulating around an implant. Peri-implantitis is caused by plaque biofilm infection and the host's immune response. The rate of destruction can be faster around implant tissues when compared to tissues around a natural tooth.<sup>3</sup> Peri-implant diseases are often the result of an infection caused by multiple types of bacteria.<sup>5,6</sup>

The risk factors for dental implant disease should be considered before and after implants are placed. Several factors increase a patient's risk for peri-implant disease. The first is a history of periodontal disease. Patients with implants and periodontal disease history are more likely to get peri-implant diseases.<sup>7,8</sup> Smoking also causes an increased risk of implant disease and implant failure.<sup>9,10</sup> Poor plaque biofilm control and irregular maintenance may cause plaque biofilm to build up on implants and surrounding tissues and put the patient at a higher risk for peri-implant diseases.<sup>11</sup> Implant crowns are often held in place with cement. During placement, excess cement must be thoroughly removed. Residual cement can put a patient at higher risk for implant diseases because it impedes proper cleaning and promotes bacterial attachment.<sup>12-14</sup> Biomechanical overload may also increase the risk of peri-implant disease. Heavy occlusal forces may affect the osseointegration

Table 1 - Risk Factors for Peri-Implant Disease

- History of periodontal diseases
- Smoking
- Poor biofilm removal or infrequent professional preventative care
- Residual cement around the prosthesis
- Biomechanical overload

of the implant threads and the bone.<sup>15,16</sup> Occlusion should be evaluated at each recall and adjusted as necessary. Occlusal tape and shim stock aid in identifying occlusal high spots where occlusal adjustment may be needed. All of these varying risk factors should be considered when treating patients with dental implants (**Table 1**).

## In-Office Dental Implant Maintenance

Dental implant maintenance should include:

- Reviewing risk factors
- Gathering assessments
- Providing treatment
- Providing patient education

Dental implants should be monitored during regular periodontal assessments at recall visits. Monitoring should include probing, noting bleeding or suppuration, monitoring mobility, and taking appropriate images (**Table 2**).

Probing dental implants was not recommended in the past, but recent literature suggests that regular probing should be included in implant maintenance.<sup>17</sup> Initial probing after implant placement should be done three months after the abutment is placed to allow for proper healing.<sup>18</sup> The clinician should look for changes in probing depths instead of the actual depth of each site. Changes in probing depths may indicate peri-implant disease. Probing should be done with light pressure, and a metal or plastic probe may be used to record probing depths.

As with other periodontal diseases, bleeding and suppuration are reliable indicators of inflammation and disease and should be documented. If bleeding, suppuration, or mobility are present around a dental implant, it may be failing. Most often, the patient will not report any pain with failing implants. Mobility is the best indicator of dental implant failure<sup>19,20</sup> and may mean the implant is not osseointegrated into the bone. Mobility is assessed similarly to how it is accomplished on a natural tooth. Two plastic-handled instruments are used to grasp the implant restoration, and light force is applied in facial and lingual directions.

## Table 2 - In-Office Implant Maintenance Protocol

- Review medical and dental history and assess risk factors for peri-implant disease
- Assess probe depths, BOP, mobility and suppuration around dental implants (plastic or metal probe can be used)
- Evaluate oral hygiene and plaque control and provide oral hygiene instructions
- Evaluate screw-retained implants for plug and evaluate the restoration for wear or damage
- Take images of implants once a year (periapical image preferred) to evaluate any changes in bone level
- Remove biofilm and calculus as necessary (debride with like-metal instruments, generally titanium scalers)
- Evaluate maintenance interval and adjust as indicated
- Make referrals as indicated (periodontist, prosthodontist)
- Document the above care within the dental record

Mobility may also be because of a loose abutment or prosthesis. This type of mobility would not indicate peri-implant disease. A dentist should evaluate the mobility of an implant or prosthesis.

Dental radiographic images can determine bone loss and the implant's health. Radiographs should be taken yearly on dental implants and more often in areas where periodontal breakdown has been documented at previous visits. Radiographs may also be taken after the crown is cemented to identify any areas of residual cement. Bone remodeling occurs during the first year after the final prosthesis, but there should be less than 0.2mm of bone loss each year.<sup>21</sup> A failing implant may show vertical destruction of crestal bone around the implant or wedge-shaped defects along the implant<sup>3</sup> (**Figure 2**).

In addition to assessment data collection, clinicians should provide treatment at the recall maintenance visit. A three-month maintenance interval is recommended for the first year after implant restoration. After the first year, maintenance intervals should be individualized based on the patient's needs.

Removing residual cement, calculus, and biofilm deposits should be part of a maintenance visit. Philosophies on types of instruments used for debridement have changed with the increasing

Figure 2 - Failing Implant



evidence. The American College of Prosthodontists currently recommends that implants be debrided with "like-metal" instruments to avoid leaving any metal residue behind.<sup>21</sup> Most implants are titanium, so titanium scalers would be the most effective and safe to use in scaling. Traditional instruments may be used around the crown, but these instruments should not be used on the implant. Traditional rubber cup polishing is not required for implants and their components. Polishing may be beneficial for rough implant surfaces, but polishing is not required if there are no scratches on the implant or abutment. Air polishing with glycine powder is the preferred method of removing plaque biofilm from around a dental implant, as it is less abrasive than other powders or polish.<sup>22,23</sup>

**Treatment Plan Coding**

When treatment planning and coding for in-office implant maintenance, it should be noted that the care of single dental implants present with natural teeth is included with D1110, D4346, and D4910. When a patient has a removable prosthesis, such as a removable overdenture, on an implant, the D6080 code can be used. D6080 is used for implant maintenance procedures when prostheses are removed and reinserted, including cleanings of prostheses and abutments. In the case of mucositis of a single implant, debridement may be necessary and can be coded as D6081. This code is not to be used in conjunction with D1110, D4910, or D4346.<sup>24</sup> (See **Table 3**)

The ultimate goal of in-office implant maintenance is to evaluate the implant’s condition, maintain alveolar bone, and reduce the causes of inflammation in surrounding tissues. Each patient’s oral status, risk, and history should be factored into the maintenance of dental implants in the dental office.

**Home Care Instructions for Patients with Implants**

The patient’s home care is one of the most critical factors in maintaining implants. Biofilm can adhere to dental implants and is the cause of the inflammatory response.<sup>11</sup> Removing biofilm at home is an integral part of managing dental implants and maintaining the health of peri-implant tissues. Home care plans should be individualized based on the needs of each patient.

Home care for single implants is usually not markedly different from that for a natural tooth, though some modifications may exist. Brushing twice daily with a power toothbrush and using a water flosser or other interdental cleaner is suggested. A stimulator can be used once a day to mechanically remove biofilm surrounding the implant. Rinsing with an essential oil or chlorhexidine antimicrobial rinse twice a day may also decrease peri-mucositis risk. The shape of the implant and crown are different from natural teeth, so techniques may also need to be modified to remove biofilm around the structure of an implant.

**Table 3 - CDT Codes Related to Implant Maintenance**

CDT Code	Use
D1110 D4910 D4346	Used when completing preventative treatment with single implants and natural teeth.
D6080	Used when completing implant maintenance procedures in which prostheses are removed and reinserted, including cleanings of prostheses and abutments
D6081	Used when debriding mucositis is present on a single implant

Interdental cleaning can be accomplished in several ways with dental implants. Water flossing, string flossing, or interproximal brushes are all effective ways to clean around a dental implant. When using string floss, the technique is modified from the C-shaped use of floss with natural teeth. The floss should be wrapped around the contours of the crown and then follow its margin to the implant abutment. The floss should be gently adapted back and forth around the abutment. Tufted or expanding floss may help clean around implants because it provides a larger surface area. Floss threaders or tufted floss may make cleaning around an implant and abutment easier. If interdental brushes are used, patients should be sure that there is a soft protective coating on the wire that secures the bristles of the brush. If the wire is not coated, it may scratch the implant or abutment, making it more plaque biofilm retentive.

Another modification in care for implant patients is the use of fluoride. Fluoride can be found in dentifrice and mouthrinses. Stannous (SnF<sub>2</sub>) and sodium fluoride (NaF) are safe for dental implants, but any dentifrice or gel must have a neutral pH. When the pH is not neutral, the fluoride ions can destroy the titanium oxide layer, which can lead to corrosion.<sup>25</sup> The pH of most dentifrices is near neutral, but acidulated phosphate fluoride in trays should be avoided in patients with titanium implants.

Education on home care should include recommendations for specific products based on the patient’s needs and their demonstration of cleaning techniques.

**Summary**

Dental implants are a standard treatment for missing teeth. The dental hygienist and dental assistant are essential in educating and treating patients with implants. Regular maintenance visits are essential in keeping peri-implant tissues healthy. Modifications for maintenance treatment and oral hygiene education may be needed for patients with implants. Implant maintenance should be tailored to each patient based on their risk, home care, and needs.

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## POST-TEST

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(1.0 CE Credit Contact Hour) Please circle the correct answer. 70% equals passing grade.

1. **Dental implants have three major areas of anatomy. These three areas are:**
  - a. Implant body, abutment post, crown
  - b. Titanium screw, abutment post, crown
  - c. Titanium screw, implant body, abutment post
  - d. Implant body, alveolar bone, crown
2. **Which of the following does not exist in dental implants?**
  - a. Junctional epithelium
  - b. Abutment
  - c. Osseointegration
  - d. Periodontal fibers
3. **Plaque biofilm-induced inflammation with no bone loss around an implant can be classified as:**
  - a. Peri-implant health.
  - b. Peri-implant mucositis.
  - c. Peri-implantitis.
  - d. Hard tissue deficiency.
4. **To prevent peri-implant mucositis and peri-implantitis, patients should:**
  - a. Use fluoride trays daily.
  - b. Brush one time per day with a power brush.
  - c. Maintain regular professional recalls.
  - d. Use glycine powder polishers daily.
5. **Which of the following bacteria most often contribute to peri-implant disease?**
  - a. *S. mutans*
  - b. *P. gingivalis*
  - c. *A. actinomycetemcomitans*
  - d. Multiple types of bacteria
6. **Probing dental implants:**
  - a. Can be done only with plastic probes.
  - b. Should wait until three months after abutment placement.
  - c. Requires heavy pressure.
  - d. Should never be done.
7. **Which of the following is the best indicator of dental implant failure?**
  - a. Bleeding on probing
  - b. Mobility
  - c. Suppuration
  - d. Radiographic bone loss
8. **After initial implant placement, a patient should have professional maintenance:**
  - a. Yearly
  - b. At six months
  - c. At three months
  - d. At four months
9. **Which one is NOT one of the goals of implant maintenance treatment?**
  - a. Removal of plaque biofilm and calculus from the implant
  - b. Oral hygiene education
  - c. Roughen the implant surface
  - d. Assess mobility and bleeding
10. **Which instruments should be used to scale implants?**
  - a. Instruments made from like-metal
  - b. Plastic curettes
  - c. Rubber cup polisher with fine grit paste
  - d. Regular ultrasonic tips

