



## **A Review on Recommendations for the Maintenance of Implant Supported Restorations**

**Ashwag Siddik Noorsaheed<sup>1\*</sup>, Asiri, Alaa Mohammad A.<sup>2</sup>,  
Abdulmalk Abdulatif A. Almaghrabi<sup>3</sup>, Alshawi, Eyad Ibrahim N.<sup>2</sup>,  
Rinad Ameer Nawab<sup>4</sup>, Fahad Khaled M. Alkahtani<sup>5</sup>, Abdullah Saad Alqarni<sup>5</sup>,  
Reema Abdulaziz D. Alsaadi<sup>6</sup>, Deemah Muneer Alhamawi<sup>7</sup>,  
Ayman Hasan Kaabi<sup>8</sup>, Khalid Ahmed H. Aljehani<sup>9</sup>, Sana Zaki Alburaiqi<sup>10</sup>  
and Osama Saeed Aljuraysh<sup>11</sup>**

<sup>1</sup>Consultant Restorative Dentist, Saudi Arabia.

<sup>2</sup>MOH, Saudi Arabia.

<sup>3</sup>King Faisal university, Saudi Arabia.

<sup>4</sup>KAU, Saudi Arabia.

<sup>5</sup>vision Colleges, Saudi Arabia.

<sup>6</sup>IBN Sina National College, Saudi Arabia.

<sup>7</sup>Ministry of Health National Gaurd, Specialised Poly Clinic, Saudi Arabia.

<sup>8</sup>King Abdulazize University, Saudi Arabia.

<sup>9</sup>King Fahad Armed Forces Hospital, Saudi Arabia.

<sup>10</sup>Advance Restorative Dentist at Qatif Central Hospital, Saudi Arabia.

<sup>11</sup>Riyadh Elm University, Saudi Arabia.

### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

### **Article Information**

DOI: 10.9734/JPRI/2021/v33i46A32903

Editor(s):

(1) Dr. R. Deveswaran, M.S.Ramaiah University of Applied Sciences, India.

Reviewers:

(1) Juhi Yadav, Govt Allopathic Medical College, India.

(2) Eri Hendra Jubhari, Hasanuddin University, Indonesia.

Complete Peer review History: <https://www.sdiarticle4.com/review-history/74638>

**Review Article**

**Received 28 July 2021  
Accepted 02 October 2021  
Published 18 October 2021**

### **ABSTRACT**

Implant placement necessitates an interdisciplinary approach in which a team of dental implant specialists, including an oral surgeon, prosthodontist, periodontist, and oral radiologist, collaborate on the design, execution, and maintenance of the implants to provide the best possible result.

According to the data, the vast majority of the participating dentists provide implant-supported restorations to their patients on a regular basis. Surprisingly, the percentage of dentists who plan implant placement and employ backward planning methods was significantly lower. This finding implies that dentists do not always follow the current scientific consensus that the placement of an implant should be based on prosthetic principles.

*Keywords: Maintenance; implant; dental.*

## 1. INTRODUCTION

Implant placement necessitates an interdisciplinary approach in which a team of dental implant specialists, including an oral surgeon, prosthodontist, periodontist, and oral radiologist, collaborate on the design, execution, and maintenance of the implants to provide the best possible result. Routine maintenance, recall evaluations, and radiographs are required once the implants have been placed in the adventurous region, and this necessitates the team of dental implant specialists to be well versed in the implant maintenance procedures as well, as an implant failure would result in a debate, which would give the profession no credit. [1] With time, the emphasis for long-term implant success has shifted from surgical phase of therapy to osseointegration and, more recently, to the long-term preservation of the peri-implant hard and soft tissues' health. As the number of patients choosing dental implants as a treatment option to replace lost teeth continues to rise, the dental team must confront the challenges of maintaining these sometimes-complicated restorations [1-4].

Implant-supported single crowns and implant-supported FDPs have good long-term survival rates, but they have significant mechanical and biologic problems. Implant-supported single crowns had a ten-year survival rate of around 95 percent, whereas implant-supported FDPs had a 93 percent survival rate. The authors propose that patients be placed in a well-structured maintenance programme because 33.6 percent of the patients suffered a mechanical and/or biologic problem in the first 5 years. Over a 5-year period, mechanical problems of implant-supported FDPs have been recorded, including veneering material fractures (13.5%), screw loosening (5.3%), loss of cemented FDP retention (4.7%), and screw fracture (1.3%) [5-11].

Dental implants feature a very high rate of success, which means that survival rates for dental implants range more than 90% after 10

years of clinical service. Nevertheless, technical and biological complications are regularly observed in implant-supported restorations. Technical complications include fractures of the implant or abutment or problems with the associated prosthetic superstructure such as chipping of the veneering, loosening or fracture of abutment screws, or wear and loss of retention in attachment systems [12-15].

With the growing popularity of implants, the most prevalent biological consequences, such as peri-implant mucositis and peri-implantitis, have become a serious worry. Many studies are currently being conducted with the goal of determining the long-term effectiveness of various implant-supported rehabilitation regimens. Peri-implant mucositis is a reversible inflammation of the soft tissue around the implant, whereas peri-implantitis encompasses both soft-tissue inflammation and bone loss around the functioning implant [16].

## 2. EVALUATION

Clinical and radiographic parameters used to assess oral implants during maintenance care should have good sensitivity and specificity, be simple to quantify, and produce repeatable results [1].

### - Oral radiology

Radiographs are an essential part of a dentist's or dental specialist's diagnostic toolkit. They help with the detection and characterisation of a variety of oral diseases and disorders, as well as treatment planning and follow-up. However, radiographic requirements should be adapted to the specific demands of each patient and assessed against the dangers of radiation exposure. As a result, the decision to get a radiograph is largely based on the clinical judgement of the dental practitioner, who should evaluate the patient's needs, medical/dental history, clinical findings, and

overall health when determining the type and number of radiographs required [17-20].

#### - **Soft-Tissue Assessment**

Checking for visible indicators of gingival inflammation, such as redness, swelling, changes in contour and consistency, aberrant gingival form, or the presence of fistulas, is part of the soft-tissue assessment. [21].

#### - **Bleeding on Probing (BOP)**

Lang et al. (1994) found that healthy peri-implant locations had no bleeding (0%), whereas peri-implant mucositis and peri-implantitis sites had significantly higher BOP (67 percent and 91 percent, respectively). Luterbacher and colleagues later demonstrated that BOP alone provides better diagnostic accuracy at implant sites than at tooth sites [1,22,23].

#### - **Plaque Index assessment**

This index was designed to evaluate oral health and oral hygiene in groups of individuals, particularly in hospitals or at other institutions. MPS consists of the sum of a four-point mucosal score (MS) and a four-point plaque score (PS) [24].

#### - **Peri-Implant Probing Depth**

In the longitudinal monitoring of peri-implant soft tissues, probing is a significant and reliable diagnostic measure. Probing around implant restorations has been proven to be safe, and it does not appear to impair the integrity of oral implants. [21,25,26,27,28,29,30,31,32]. The connective tissue zone has just two fiber groups, none of which is implanted into the implant, and the junctional epithelial attachment zone has decreased attachment strength to the implant. As a result, the probe extends beyond the peri-implant sulcus and into the bone, necessitating the use of a lower probing force (0.2-0.3 N) around implants. Successful implants typically have a probing depth of 3 mm, however pockets of 5 mm or higher provide a safe haven for germs and can cause peri-implantitis. [1,33,34].

#### - **Peri-Implant Sulcus Fluid Analysis (PISF)**

Several biochemical mediators found in the PISF have been discovered as potential host markers for peri-implant disease activity and development, and their study provides a noninvasive way to assess the role of the host response in peri-implant disease [1].

- **Suppuration** is a solid indicator of disease activity and shows the necessity for anti-infective medication [1].

#### - **Occlusal Evaluation**

The implant's and prosthesis' occlusal condition must be checked on a regular basis. Occlusal disharmonies, such as early contacts or interferences, should be recognised and addressed to avoid occlusal overload, which can lead to a variety of issues, including abutment screw loosening, implant failure, and prosthesis failure [1].

#### - **Keratinized Tissue**

The literature is divided on whether the presence or absence of keratinized tissue affects the long-term health of implants. Lack of keratinized tissue has been linked to modest bone loss, higher plaque formation, increased soft-tissue recession, increased probing bleeding, and increased gingival inflammation in some studies. Another study, on the other hand, found no link between keratinized tissue breadth and implant survival [21,35-39].

#### - **Evaluation of Implant Stability/Mobility**

Unlike a tooth, for which mobility is not a primary factor for longevity, mobility is a primary determining factor for implant health. Rigid fixation is usually the first clinical criterion evaluated for a dental implant. The techniques to assess rigid fixation are similar to those used for natural tooth mobility [1].

### **3. DIAGNOSIS**

The patient's implants are classified as healthy if there are no clinical signs of inflammation.

#### - **Implant Mucositis**

Apart from the original 0.2–2 mm cratering that happens quickly after abutment

connection surrounding some osseointegrated implants, mucositis is described as a localised inflammatory lesion within the soft tissue with no progressive bone loss. Redness and bleeding on gentle probing (pressure 0.15 N) can be used to diagnose mucositis.

#### - Peri-implantitis

A localised inflammatory lesion accompanied by bone loss around an osseointegrated implant is known as peri-implantitis. The mucosal lesion in peri-implantitis is frequently linked with suppuration or a deepening of clinical probing depths, and it is invariably followed by bleeding on probing and loss of supporting marginal bone beyond the original bone loss [21].

### 4. MAINTENANCE

The long-term success of an implant is largely dependent on the long-term health of the peri-implant hard and soft tissues. A typical maintenance visit for patients with dental implants should include a review of the patient's medical and dental history, a clinical and radiographic examination of the implants and peri-implant tissues, evaluating implant stability, removing any implant-retained plaque and calculus, and setting maintenance intervals. This maintenance visit should last one hour and be done every three months [1].

In dentistry, maintenance programmes have traditionally concentrated on younger patient groups and on diagnosing and controlling chronic conditions including caries and periodontal disease. The American Academy of Dental Science recommended for the standard 6-month patient recall interval utilised by dentists around the world as early as 1879. In its inaugural oral health patient pamphlet, the American Dental Association (ADA) also campaigned for the 6-month recall. In the 1930s, a prominent dentifrice commercial (Ipana; Bristol-Meyers Company, New York, NY) advocated the 6-month interval for dental appointments, which eventually gained widespread acceptance as a standard in the dental insurance market [5,40,41,42,43].

#### 4.1 Home Maintenance

In the one-stage system, the patient must begin the implant care regimen immediately after surgical installation, in the two-stage system, following implant site exposure, and in the two-

stage system, upon premature exposure of the implant healing screw. Chemical plaque control (e.g., chlorhexidine) should be utilised during healing times when mechanical plaque control is not possible [1].

This classification summarize all maintenance techniques that can be used by patient as well as medical care practitioner

#### 1. Home Care Steps Includes:

- Brushing
- Soft manual toothbrush
- Motorized tooth brush/power brush
- Automated/sonic tooth brush
- End-tufted brush
- Tapered rotary brush

#### 2. Professional Care:

- Scaling and curettage
- lastic instruments
- Plastic instruments reinforced with graphite
- Gold-plated cures
- Ultrasonic or sonic scaler covered with a plastic sleeve

#### 3. Interproximal/circumferential cleaning:

##### A. Floss:

- Plastic floss
- Braided flossing cord
- Satin floss
- Woven floss
- Yarns dental tapes

##### B. Interproximal cleaners

- Foam tips
- Interproximal brushes with a plastic coated wire
- Disposable wooden picks

#### 4. Polishing

- Rubber cup with a nonabrasive polishing paste Such as aluminum oxide, tin oxide, APF-free prophylactic paste, and low-abrasive dentifrice
- Air polishing

#### 5. Locally applied chemotherapeutics

- For example: chlorhexidine digluconate (0.12%), plant alkaloids,

or phenolic agents . Arestin, Atridox, PerioChip, or Dentomycin

## 6. Water irrigation

- For example: Hydro Floss

## 7. Subgingival irrigation

- Antiseptic agents such as Peroxide, Listerine, or Chlorhexidine using a plastic irrigation tip. [1]

## 4.2 Root Planing and Scaling

Plastic curettes and fine polishing pastes are used in scaling and root planing operations. Plastic scalers should be used to remove both hard and soft deposits during professional maintenance. When removing calculus from implant surfaces, some plastic devices are extremely flexible and can be difficult to use. Plastic instruments with graphite reinforcement are more robust and sharpenable. Stainless steel, titanium, and traditional stainless-steel Instruments with and gold-tipped tips may scrape the implant surface, allowing biofilm to form. Traditional ultrasonic tips also appear to cause severe implant surface damage [21].

## 4.3 Adjustment of the Occlusion

Traumatic occlusion, in addition to peri-implant inflammation, is another possible cause of bone collapse around the implant. As a result, an occlusal examination should be performed during the implant maintenance consultation. Even in the absence of inflammation in the peri-implant tissue, studies in monkeys revealed that bone resorption around implants with 180 m of excess superstructure height could occur [21].

## 5. DISCUSSION

Patients with implant-borne removable and fixed restorations require lifelong professional recall regimes to offer biological and mechanical maintenance that is individualised for each patient, according to a substantial body of data. The use of particular oral topical agents and oral hygiene aids can also improve professional and at-home care of implant-borne restorations, according to current research. Because of variances in prosthetic materials and designs, there is evidence of disparities in mechanical and biological maintenance requirements. Due to gaps in available evidence, clinical practise

guidelines for recall and maintenance of patients with implant-borne dental restorations are being developed [5].

There is a scarcity of research on how to execute effective and optimal oral care around dental implants. At the moment, home care suggestions are based on what is currently known about natural tooth cleaning. It becomes clear that academic institutions and industry must launch and support high-quality randomised controlled clinical trials on this topic as soon as possible [44].

According to the data, the vast majority of the participating dentists provide implant-supported restorations to their patients on a regular basis. Surprisingly, the percentage of dentists who plan implant placement and employ backward planning methods was significantly lower [45,46]. This finding implies that dentists do not always follow the current scientific consensus that the placement of an implant should be based on prosthetic principles. In this regard, it has lately been stated that dental technicians play an important part in decision-making, implying that dentists' prosthetic expertise should be constantly expanded [47].

Mechanical plaque removal is the foundation of successful periimplant therapy; patient- and professionally administered plaque control has been shown to reduce periimplant inflammation, though complete resolution of inflammation is not always apparent [46,48]. Moreover the use of adjunctive chemical agents in maintaining periimplant health is still unknown; and d) regular periimplant mammography is recommended [47].

## 6. CONCLUSION

Professional implant maintenance is essential for the long-term success of dental implants. This also includes an evaluation of the patient's general and dental health. In today's context of high patient expectations about the lifespan of implant restorations, the clinician's utilisation of prescribed maintenance routine and materials is critical. After successful implant restorations, all doctors must educate their patients about implant home care and insist on frequent maintenance checkups.

## CONSENT

It is not applicable.

## ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Gulati M, Govila V, Anand V, Anand B. Implant Maintenance: A Clinical Update. *Int Sch Res Notices*. 2014;2014:908534. DOI: 10.1155/2014/908534. PMID: 27437506; PMCID: PMC4897104.
2. Cohen RE. Position paper: periodontal maintenance. *Journal of Periodontology*. 2003;74(9): 1395–1401.
3. Silverstein LH, Kurtzman GM. Oral hygiene and maintenance of dental implants. *Dentistry Today*. 2006;25(3):70–75.
4. Kurtzman GM, Silverstein LH. Dental implants: oral hygiene and maintenance: implant. *Dentistry Today*. 2007;1(3):48–53.
5. Bidra AS, Daubert DM, Garcia LT, Gauthier MF, Kosinski TF, Nenn CA, Olsen JA, Platt JA, Wingrove SS, Chandler ND, Curtis DA. A Systematic Review of Recall Regimen and Maintenance Regimen of Patients with Dental Restorations. Part 2: Implant-Borne Restorations. *J Prosthodont*. 2016;25 Suppl 1:S16-31. DOI: 10.1111/jopr.12415. PMID: 26711217.
6. Pjetursson BE, Thoma D, Jung R, et al. A systematic review of the survival and complication rates of implant-supported fixed dental prostheses (FDP's) after a mean observation period of at least 5 years. *Clin Oral Implants Res* 2012;6:22-38
7. Wittneben J, Buser D, Salvi GE, et al: Complication and failure rates with implant-supported fixed dental prostheses and single crowns: a 10-year retrospective study. *Clin Implant Dent Relat Res* 2014;16:356-364
8. Pjetursson BE, Bragger U, Lang NP, et al. Comparison of survival and complication rates of tooth-supported fixed dental prostheses (FDPs) and implant-supported FDPs and single crowns (SCs). *Clin Oral Impl Res* 2007;18:97-113
9. Goodacre CJ, Bernal G, Rungcharassaeng K, et al. Clinical complications with implants and implant prostheses. *J Prosthet Dent* 2003;90:121-132
10. Pjetursson BE, Helbling C, Weber HP, et al: Peri-implantitis susceptibility as it relates to periodontal therapy and supportive care. *Clin Oral Implants Res* 2012;23:888-894
11. Lindquist LW, Carlsson GE, Jemt TA: A prospective 15-year follow-up study of mandibular fixed prostheses supported by osseointegrated implants. Clinical results and marginal bone loss. *Clin Oral Implants Res* 1996;7:329-336
12. Glücker C, Rauch A, Hahnel S. Attitude and treatment options in implant-supported prosthetics: A survey among a cohort of German dentists. *J Adv Prosthodont*. 2020;12(1):15-21. DOI: 10.4047/jap.2020.12.1.15. Epub 2020 Feb 20. PMID: 32128082; PMCID: PMC7040449.
13. Paquette DW, Brodala N, Williams RC. Risk factors for endosseous dental implant failure. *Dent Clin North Am*. 2006;50:361–374.
14. Norowski PA, Jr, Bumgardner JD. Biomaterial and antibiotic strategies for peri-implantitis: a review. *J Biomed Mater Res B Appl Biomater*. 2009;88:530–543.
15. Bumgardner JD, Adatrow P, Haggard WO, Norowski PA. Emerging antibacterial biomaterial strategies for the prevention of peri-implant inflammatory diseases. *Int J Oral Maxillofac Implants*. 2011;26:553–560.
16. Kandasamy B, Samson EP, Yaqoob A, Pandey P, Deenadayalan S, Das I. Evaluation of Clinical Parameters in Implant Maintenance Phase for Prevention of Peri-implantitis. *J Int Soc Prev Community Dent*. 2018 Jul-Aug;8(4):361-364. DOI: 10.4103/jispcd.JISPCD\_64\_18. Epub 2018 Jul 18. PMID: 30123771; PMCID: PMC6071357.
17. Nassar H, Al-Dabbagh N, Aldabbagh R, Albahiti M, Jadu FM, Qutob A, Mawardi H. Dental follow-up and maintenance index: the development of a novel multidisciplinary protocol. *Heliyon*. 2020; 6(5):e03954. DOI: 10.1016/j.heliyon.2020.e03954 PMID: 32478186; PMCID: PMC7248670.
18. Harvey CE. Questions about dental radiograph. *J. Am. Vet. Med. Assoc*. 2004;224(9):1418. author reply 1418-9

19. Wolfgang L. The dental digital radiograph. NY. State Dent. J. 2001;67(10):38–40
20. U.S.D.o.H.a.H.S.P.H.S.F.a.D.A. American Dental Association Council on Scientific Affairs, Dental Radiographic Examination: Recommendations for Patient Selection and Limiting Radiation Exposure; 2012. Available:[https://www.ada.org/~/media/ADA/Member%20Center/Files/Dental\\_Radiographic\\_Examinations\\_2012.pdf](https://www.ada.org/~/media/ADA/Member%20Center/Files/Dental_Radiographic_Examinations_2012.pdf)
21. Todescan S, Lavigne S, Kelekis-Cholakias A. Guidance for the maintenance care of dental implants: clinical review. J Can Dent Assoc. 2012;78:c107. PMID: 23306040.
22. Histologic probe penetration in healthy and inflamed peri-implant tissues. Lang NP, Wetzel AC, Stich H, Caffesse RG Clin Oral Implants Res. 1994; 5(4):191-201.
23. Diagnostic characteristics of clinical and microbiological tests for monitoring periodontal and peri-implant mucosal tissue conditions during supportive periodontal therapy (SPT). Luterbacher S, Mayfield L, Brägger U, Lang NP Clin Oral Implants Res. 2000;11(6):521-9.
24. Henriksen BM, Ambjørnsen E, Axéll TE. Evaluation of a mucosal-plaque index (MPS) designed to assess oral care in groups of elderly. Spec Care Dentist. 1999;19(4):154-7. DOI: 10.1111/j.1754-4505.1999.tb01378.x. PMID: 10765880.
25. Lindhe J, Meyle J; Group D of European Workshop on Periodontology. Peri-implant diseases: Consensus Report of the Sixth European Workshop on Periodontology
26. Humphrey S. Implant maintenance. Dent Clin North Am. 2006;50(3):463-78.
27. Newman MG, Flemmig TF. Periodontal considerations of implants and implant associated microbiota. Int J Oral Implantol. 1988;5(1):65-70.
28. Orton GS, Steele DL, Wolinsky LE. The dental professional's role in monitoring and maintenance of tissue-integrated prostheses. Int J Oral Maxillofac Implants. 1989;4(4):305-10.
29. Becker W, Becker BE, Newman MG, Nyman S. Clinical and microbiologic findings that may contribute to dental implant failure. Int J Oral Maxillofac Implants. 1990;5(1):31-8.
30. Lavigne SE, Krust-Bray KS, Williams KB, Killoy WJ, Theisen F. Effects of subgingival irrigation with chlorexidine on the periodontal status of patients with HA-coated integral dental implants. Int J Oral Maxillofac Impl. 1994;9(2):156-62.
31. Lang NP, Berglundh T, Heitz-Mayfield LJ, Pjetursson BE, Salvi GE, Sanz M. Consensus statements and recommended clinical procedures regarding implant survival and complications. Int J Oral Maxillofac Implants. 2004;19(Suppl):150-4.
32. Etter TH, Håkanson I, Lang NP, Trejo PM, Caffesse RG. Healing after standardized clinical probing of the perimplant soft tissue seal: a histomorphometric study in dogs.
33. Implant maintenance. Humphrey S Dent Clin North Am. 2006; 50(3):463-78,viii.
34. Tissue integration of non-submerged implants. 1-year results of a prospective study with 100 ITI hollow-cylinder and hollow-screw implants. Buser D, Weber HP, Lang NP Clin Oral Implants Res. 1990;1(1):33-40.
35. Bouri A Jr, Bissada N, Al-Zahrani MS, Fadoul F, Nounen I. Width of keratinized gingiva and the health status of the supporting tissues around dental implants. Int J Oral Maxillofac Implants. 2008;23(2):323-6.
36. Chung DM, Oh TJ, Shotwell JL, Misch CE, Wang HL. Significance of keratinized mucosa in maintenance of dental implants with different surfaces. J Periodontol. 2006;77(8):1410-20.
37. Schrott AR, Jimenez M, Hwang JW, Fiorellini J, Weber HP. Five-year evaluation of the influence of keratinized mucosa on peri-implant soft-tissue health and stability around implants supporting full-arch mandibular fixed prostheses. Clin Oral Implants Res. 2009;20(10):1170-7. Epub 2009 Aug 30.
38. Adibrad M, Shahabuei M, Sahabi M. Significance of the width of keratinized mucosa on the health status of the supporting tissue around implants supporting overdentures. J Oral Implantol. 2009;35(5):232-7.
39. Zigdon H, Machtei EE. The dimensions of keratinized mucosa around implants affect clinical and immunological parameters. Clin Oral Implants Res. 2008;19(4):387-92. Epub 2008 Feb 11.
40. Boggs A, Maurer S, Mourino A, et al: Recall intervals: effect on treatment needs- a retrospective study. J Clin Pediatr Dent 1996;20:119-122
41. Maurer S, Boggs A, Mourino A, et al: Recall intervals: effect on treatment needs

- of the handicapped patient- a retrospective study. *J Clin Pediatr Dent* 1996;20:123-126
42. Wang N, Marstrander P, Holst D, et al: Extending recall intervals: effect on resource consumption and dental health. *Community Dent Oral Epidemiol* 1992;20:122-124
43. Patel S, Bay C, Glick M: A systematic review of dental recall intervals and incidence of dental caries. *J Am Dent Assoc* 2010;14:527-539
44. Louropoulou A, Slot DE, Van der Weijden F. Mechanical self-performed oral hygiene of implant supported restorations: a systematic review. *J Evid Based Dent Pract.* 2014;14 Suppl:60-9.e1. DOI: 10.1016/j.jebdp.2014.03.008. Epub 2014 Mar 28. PMID: 24929590.
45. Mortilla LDT. Hygiene and soft tissue management: the hygienist's perspective. In: Babbush C. A., editor. *Dental Implants: The Art and Science*. Philadelphia, Pa, USA: W.B. Saunders; 2001;423-444.
46. Implant maintenance. *Humphrey S Dent Clin North Am.* 2006;50(3):463-78, viii.
47. Kelekis-Cholakis A, Rothney J. Maintenance of Implant Patients: A Narrative Review. *Implant Dent.* 2019 Apr;28(2):161-172. DOI: 10.1097/ID.0000000000000837 PMID: 30601226.
48. Teich ST. Risk Assessment-Based Individualized Treatment (RABIT): a comprehensive approach to dental patient recall. *J Dent Educ* 2013;77:448-457

© 2021 Noorsaeed et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*

*The peer review history for this paper can be accessed here:*  
<https://www.sdiarticle4.com/review-history/74638>