

Stage 4 | Aftercare and maintenance

Step 2

Maintenance visit



Assessment and treatment planning

-  Step 1 | Patient's expectations, history and examination
-  Step 2 | Treatment planning
-  Step 3 | Consultation and consent
-  Step 4 | Fabrication of the surgical drill template

Surgical procedures

-  Step 1 | Implant surgery
 -  Step 2 | Post-operative review and suture removal
- 7–10 days

Prosthetic procedures

-  Step 1 | Impression-taking
 -  Step 2 | Fabrication of the final prosthesis
 -  Step 3 | Insertion of the final prosthesis
- 6–8 weeks

Aftercare and maintenance

-  Step 1 | Review visit
 -  Step 2 | Maintenance visit
- 2 weeks
- 3–6 months (or as necessary)

 In clinic with patient  Office / Lab work



Contents

Introduction	4
Learning objectives	5
1. Assessment	6
1.1 Medical and dental history	6
2. Clinical examination	6
2.1 General	6
2.2 Implant and crown	7
2.3 Radiographic examination	9
3. Implant-specific diagnosis	10
4. Standard maintenance treatment	11
Checklist for maintenance visits	12



Introduction



Each maintenance visit should comprise of:

- Assessment and update of medical/dental history
- Clinical examination of implant crown and peri-implant tissues
- Radiographic monitoring (if necessary)
- Evaluation of risk factors
- Reinforcement of oral hygiene

Patients who have undergone successful implant therapy should be evaluated at regular intervals by their dentist. During each maintenance visit, a thorough assessment and update of the patient's medical and dental history must be made and recorded. A clinical examination of the implant-supported prosthesis including the evaluation of risk factors and monitoring of the peri-implant tissues (e.g., presence of plaque, probing pocket depths, bleeding on probing and/or suppuration, etc.) is done.

All these clinical (and radiographic if indicated) findings are recorded and compared with the established baselines after delivery of the final implant-supported prosthesis. The frequency of maintenance visits for long-term monitoring depends on clinical and radiographic findings upon completion of the prosthodontic work, risk factors the patient may have, and the outcome of each maintenance visit.

Oral hygiene is reinforced at every maintenance visit and the next appointment is scheduled according to the patient's needs to ensure good long-term monitoring.



Learning objectives

-  Be able to routinely assess the condition of the implant, crown, soft tissue and bone levels around the implant.
-  Perform implant-specific clinical evaluation to diagnose healthy peri-implant tissues.
-  Recognize signs and symptoms of biological and technical complications and know how to manage these complications.



1. Assessment

1.1 Medical and dental history

- Review and update the patient's medical and dental history
- Obtain feedback from the patient about the implant site, comfort and function

Thoroughly review and update the patient's medical and dental history.



You may use this example of a [Clinical Record Form](#) to record your findings.

2. Clinical examination

2.1 General

- Extra-oral and intra-oral examination
- Dental and periodontal examination

Look out for any signs and symptoms at the implant site.



2.2 Implant and crown

2.2.1 At the implant:



- Check the implant stability: Apply the handle of a dental mirror onto the crown and try to move the implant by pushing in an oro-facial direction.

Check for:

- Implant stability
- Peri-implant soft tissue condition
- Plaque scores
- Probing depths
- Bleeding on probing
- Suppuration
- Stability and location of gingival margin



If only the crown moves, this may be a sign of screw-loosening. If the whole implant is mobile, complete loss of osseointegration has occurred and is a sign of total implant failure¹. The cause of any mobility should be determined whether it is due to crown-loosening or loss of implant stability or both.

- Assess the peri-implant soft tissue condition. Check for visual signs of inflammation such as redness, swelling, alteration in contour or consistency, and fistulas.
- Take a plaque control record (O'Leary index) to assess the patient's oral hygiene skills.
- Record clinical probing depths with gentle pressure (approximately 0.15 N of force²).



- Monitor and record bleeding on probing scores at least once a year, to be able to detect any early signs of peri-implant disease.



- Check for any suppuration.
- Check the stability and location of the soft tissue margin, look out for gingival recession.



2.2.2 At the crown:

- Check for proper retention of the crown.



Any movement at this stage may be due to:

- lack of osseointegration of the implant.
- possible failure of the cement bond between the supra-structure and the abutment.
- fracture or loosening of the abutment and/or crown.



- In screw-retained crowns, check whether the restoration in the screw access hole is still intact and providing a good seal.

- Check the occlusal contact at the implant crown³:
 - anterior or lateral guidance with natural dentition.
 - light contact on the crown during heavy occlusion and no contact during light occlusion are recommended.
 - shimstock should be held with only tightly clenched teeth to avoid excessive occlusal loading.
 - avoid non-centric interference and premature contacts.



- Look out for signs of occlusal wear, chipping or fracture of the veneered ceramic. This could be a sign of bruxism or other para-functional activity, and can lead to prosthetic failure or complications.



Check for:

- Crown or screw loosening
- Integrity of screw access hole restoration
- Occlusal interferences or disharmony
- Signs of crown wear or parafunctional activity



⚠ Caution: Screw loosening is a common problem in implant dentistry⁴. The screw that retains the abutment or the screw that retains the crown can come loose. In the case of the abutment screw, it is sometimes difficult to determine whether the actual implant or only the abutment screw is loose.



One useful hint is the presence of a fistula located within the keratinized mucosa in close proximity to the microgap. Once the abutment is loose, the microgap widens considerably, which results in heavier microbial colonization, often resulting in the formation of a fistula.

The presence of a fistula can be an indicator for abutment screw loosening.

2.3 Radiographic examination

Standard periapical radiographs using the long-cone paralleling technique can be taken every 2-3 years. However, this interval should be varied according to the patient's needs.

For example, if there are clinical signs or a need to monitor the following:



- peri-implant mucositis or inflammation
- prosthetic status of the crown, abutment or screw
- possible cement remnants
- increase in clinical probing depths
- bleeding on probing
- suppuration

Routine periapical radiographic examination can be done every 2-3 years or more frequently if necessary.

⚠ Caution: If there are signs of radiographic bone loss, this could mean a peri-implant infection is taking place and additional surgical or non-surgical therapy might be indicated. A consultation or referral to a periodontal specialist is recommended.

Radiographic bone loss can be an indicator for a peri-implant infection.



3. Implant-specific diagnosis

- Healthy soft tissue conditions.
- Peri-implant mucositis – presence of inflammation confined to the soft tissues surrounding the dental implant with no signs of loss of supporting bone following initial bone remodeling during healing.



- Peri-implantitis – presence of inflammation around a dental implant, which includes both soft tissue inflammation and progressive loss of supporting bone beyond biological bone remodeling.

Know how to differentiate between:

- healthy peri-implant tissues
- peri-implant mucositis
- peri-implantitis



4. Standard maintenance treatment

- Review oral hygiene compliance and reinforce oral hygiene instructions.
- Remove plaque and calculus from supra- and subgingival areas and polish teeth.
- Behavioral modifications
 - Oral hygiene habits
 - Control of risk factors such as smoking
- Occlusal adjustments if necessary
- Plan maintenance visit frequency

⚠ Caution: Patients with a higher risk of peri-implantitis (e.g., smokers, history of chronic periodontal disease, poor plaque control) should be identified and monitored at least every 3 months.

⚠ Caution: Routine instrumentation may scratch exposed implant surfaces resulting in surface alterations that may enhance plaque accumulation. Studies have shown that titanium and hydroxyapatite-coated surfaces are frequently scratched when metal curettes or ultrasonic devices are used. Therefore, plastic curettes, graphite or nylon-type instruments and rubber cups with fine abrasive paste for polishing are recommended⁵.

Maintenance protocol includes:

- Oral hygiene review
- Scaling and polishing
- Identification of modified risk factors or habits
- Check of occlusion
- Planning of maintenance intervals

Monitor patients who are at higher risk of peri-implant complications more frequently.



Aftercare and maintenance

Step 2 | Maintenance visit

CHECKLIST FOR MAINTENANCE VISITS

- Assessment
 - Medical and dental history

- Clinical examination
 - General
 - Implant and crown
 - Radiographic examination

- Implant-specific diagnosis
 - Healthy soft tissue conditions
 - Peri-implant mucositis
 - Peri-implantitis

- Standard maintenance treatment
 - Review oral hygiene compliance and reinforce oral hygiene instruction.
 - Remove plaque and calculus from supra- and subgingival areas and polish teeth.
 - Behavioral modifications
 - Occlusal adjustments if necessary
 - Plan maintenance visit frequency



Aftercare and maintenance

Step 2 | Maintenance visit

REFERENCES

- 1 Mombelli A, Lang NP. The diagnosis and treatment of peri-implantitis. *Periodontol* 2000. 1998;17:63–76.
- 2 Gerber et al 2008. Bleeding on probing and pocket probing depth in relation to probing pressure and mucosal health around oral implants. *Clinical Oral Implants Research* Jan 2009 Vol.20: 75-78.
- 3 Kim et al 2005. Occlusal considerations in implant therapy: clinical guidelines with biomechanical rationale. *Clin Oral Implants Res.* 2005 Feb;16(1):26-35.
- 4 Sailer et al 2012. Cemented and screw-retained implant reconstructions: A systematic review of the survival and complication rates *Clin Oral Implants Res* 23 (Suppl. 6) 2012, 163-201.
- 5 Fox et al. 1990. The effects of scaling a titanium implant surface with metal and plastic instruments: an in vitro study. *J Periodontol.* 1990 Aug;61(8):485-90.



Aftercare and maintenance

Step 2 | Maintenance visit

DISCLAIMER

Straumann® Smart is a blended training and education program focused on the education of general dentists who want to become surgically active in the field of dental implantology. The program is limited to information pertaining to straightforward implant cases and focuses on a reduced portfolio of products that are suitable for the treatment of such cases.

All clinical Straumann® Smart content – such as texts, medical record forms, pictures and videos – was created in collaboration with Prof. Dr. Christoph Hämmerle, Prof. Dr. Ronald Jung, Dr. Francine Brandenburg-Lustenberger and Dr. Alain Fontollet from the University of Zürich, Clinic for Fixed and Removable Prosthodontics and Dental Material Science, Switzerland.

Straumann does not give any guarantee that Straumann® Smart provides sufficient knowledge or instruction for the dental professional to become surgically active in the field of implantology. It is the dental professional's sole responsibility to ensure that he/she has the appropriate knowledge and instruction before placing dental implants.

Straumann® Smart does not replace a careful and thorough analysis of each individual patient by a dental professional. Further, it does not imply any guarantee or warranty with regard to completeness of the information provided to the patient. It does not replace the dental professional's duty to inform the patient about the treatment, the products and the risks involved and to receive the patient's informed consent. The dental professional is solely responsible for determining whether or not a treatment or product is suitable for a particular patient and circumstances. Knowledge of dental implantology and instruction in the handling of the relevant products is always necessary and the sole responsibility of the dental professional. The dental professional must always comply with the individual product's Instructions For Use as well as all laws and regulations.

STRAUMANN DISCLAIMS, TO THE EXTENT POSSIBLE BY LAW, ANY LIABILITY, EXPRESS OR IMPLIED, AND BEARS NO RESPONSIBILITY FOR ANY DIRECT, INDIRECT, PUNITIVE, CONSEQUENTIAL OR OTHER DAMAGES, ARISING OUT OF OR IN CONNECTION WITH ANY INFORMATION PROVIDED TO PATIENTS, ERRORS IN PROFESSIONAL JUDGMENT, IN PRODUCT CHOICES OR PRACTICE IN THE USE OR INSTALLATION OF STRAUMANN PRODUCTS.

All clinical content as well as clinical and radiographic images are provided by courtesy of Prof. Dr. Christoph Hämmerle, Prof. Dr. Ronald Jung, Dr. Francine Brandenburg-Lustenberger and Dr. Alain Fontollet from the University of Zürich, Clinic for Fixed and Removable Prosthodontics and Dental Material Science, Switzerland.

International Headquarters

Institut Straumann AG

Peter Merian-Weg 12

CH-4002 Basel, Switzerland

Phone +41 (0)61 965 11 11

Fax +41 (0)61 965 11 01

www.straumann.com

© Institut Straumann AG, 2016. All rights reserved.

Straumann® and/or other trademarks and logos from Straumann® mentioned herein are the trademarks or registered trademarks of Straumann Holding AG and/or its affiliates.