THE UNIVERSITY OF WESTERN AUSTRALIA

Re-evaluation, Maintenance and Risk Assessment

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Reading Resources

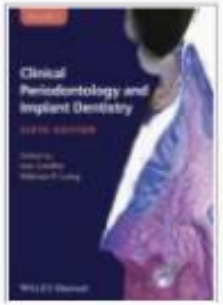
BOOK

Periodontology at a Glance

Clerehugh, Valerie. ; Tugnait, Aradhna. ; Genco, Robert J. ;
Somerset : Wiley; 2013

Available Online >

▼ Clinical Periodontology and Implant Dentistry, 2 Volume Set



by Niklaus P. Lang, , Jan Lindhe, , and Niklaus P Lang

PUBLISHER
John Wiley & Sons, Incorporated

DATE
2015-03-25

Topics

Re-evaluation

When do we re-assess?

Endpoints of periodontal therapy

Corrective or Maintenance

Step 4 Maintenance

Supportive Periodontal Care

Why is maintenance important?

Risk Assessment

Aim

Periodontal Risk Assessment

- Lang and Tonetti 2003

Periodontal Re-Evaluation

RE-EVALUATION

- Maintenance of the health, function, comfort and aesthetics of all supporting and surrounding tissues of teeth and dental implants.

- GOALS:
  - Preserve, improve and maintain natural dentition, implants and surrounding tissues.
  - Obtain a healthy Periodontium/Peri-implant tissues:

  Absence of inflammation and progressive attachment/bone loss.

Periodontal Re-evaluation

Q. When should we re-evaluate?

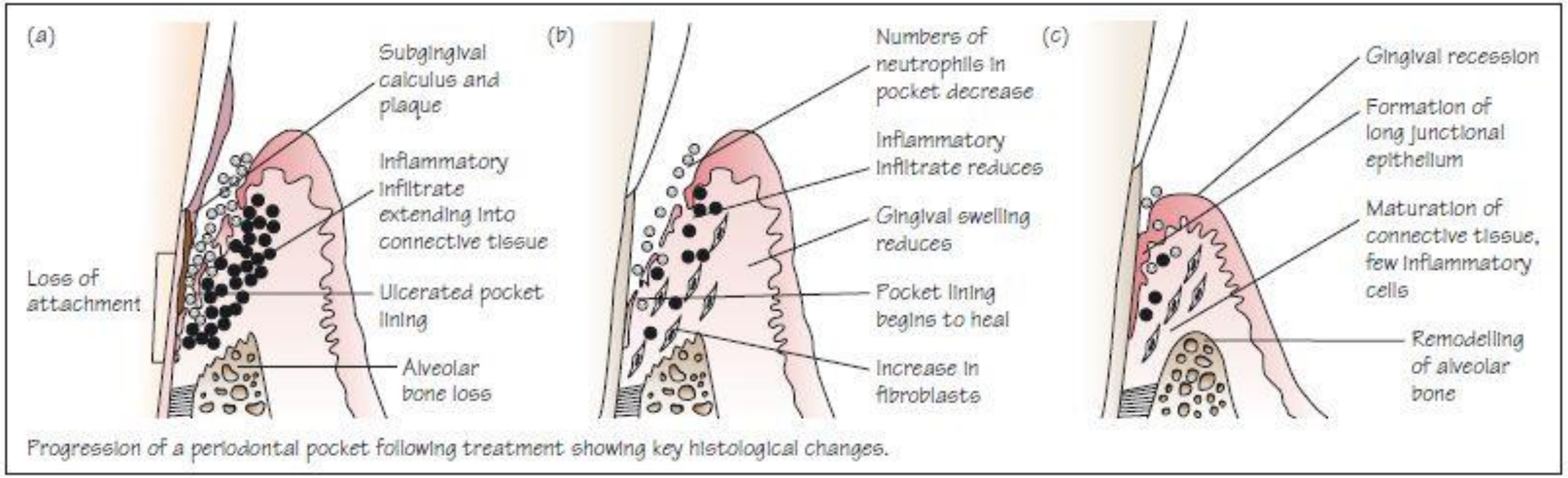
- 6-12 weeks post active periodontal treatment

Q. Why do we re-evaluate at these time points and not earlier or even later?

- *Healing is occurring*

Q. Would individuals with certain systemic risk factors or grades have an effect on healing time?

- *Yes, individuals with uncontrolled diabetes, smokers, and individuals with grade C may require a longer healing time.*



Progression of a periodontal pocket following treatment showing key histological changes.

Periodontal Wound Healing (Brief Summary)

Endpoints of periodontal therapy

READ ME

No periodontal pockets >4 mm with bleeding on probing

OR

No deep periodontal pockets [≥6 mm]

Sanz, M., Herrera, D., Kebschull, M., Chapple, I., Jepsen, S., Berglundh, T., ... & Wennström, J. (2020). Treatment of stage I–III periodontitis—The EFP S3 level clinical practice guideline. *Journal of clinical periodontology*, *47*, 4-60.

Definitions

Periodontal Disease Stability

- Successfully treated periodontitis with control of local and systemic factors.
- Minimal Bleeding on Probing (BoP).
- Optimized Periodontal Probing Depth (PPD) and Clinical Attachment Levels.
- No progressive periodontal destruction.

Lang, N. P., & Bartold, P. M. (2018). Periodontal health. *Journal of periodontology*, *89*, S9-S16.

Definitions

Periodontal Disease Remission / Control

- Inflammation reduced but not fully resolved.
- Some improvement in PPD and Clinical Attachment Levels.
- Local and systemic contributing factors remain uncontrolled.
- Acceptable outcome for patients with persistent risk factors (e.g., smoking, diabetes).

Lang, N. P., & Bartold, P. M. (2018). Periodontal health. Journal of periodontology, 89, S9-S16.

Supported by

BSP UK CLINICAL PRACTICE GUIDELINES FOR THE TREATMENT OF PERIODONTAL DISEASES

ORAL HEALTH AND RISK ASSESSMENT, DIAGNOSIS & CARE PLAN

Diagnosis: Periodontal Health ⇔ Gingivitis ⇒ Periodontitis

Extract teeth with hopeless prognosis or unsavable teeth – eg grade III mobile

STEP 1

Building foundations for optimal treatment outcomes

- I: Explain disease, risk factors & treatment alternatives, risks & benefits including no treatment
- II: Explain importance of Oral Hygiene (OH), encourage and support behaviour change for OH improvement
- III: Reduce risk factors including removal of plaque retentive features, smoking cessation and diabetes control interventions
- IV: Provide individually tailored OH advice including interdental cleaning, + / - adjunctive efficacious toothpaste & mouthwash, + /- Professional Mechanical Plaque Removal (PMPR) including supra and subgingival scaling of the clinical crown
- V: Select recall period following published guidance and considering risk factors such as smoking and diabetes
- VI: Oral Health Educator (I, II), Hygienist, Therapist (I – IV), Dentist, Practitioner accredited for Level 2 and 3 care (I – V)

Re-evaluate

- Non-engaging patient – return to STEP 1 & repeat
- Engaging patient – move to STEP 2 → **Consider referral**

STEP 2 > (see over)

BSP British Society of Periodontology and Implant Dentistry

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Periodontitis (continued)

STEP 2

Subgingival Instrumentation (root surface debridement / PMPR on root)

I: Reinforce OH, risk factor control, behaviour change

II: Subgingival instrumentation, hand or powered (sonic / ultrasonic), either alone or in combination

III: Use of adjunctive systemic antimicrobials determined by Practitioner accredited for Level 2 and 3 care

↓

Re-evaluate after 3 months

- Unstable → **STEP 3**
- Stable → **STEP 4**

STEP 3

Managing non-responding sites:

I: Reinforce OH, risk factor control, behaviour change

II: Moderate (4–5mm) residual pockets – re-perform subgingival instrumentation

III: Deep residual pocketing (≥6mm). Consider alternative causes

IV. Consider referral for pocket management or regenerative surgery

V: If referral not possible, re-perform subgingival instrumentation (If all sites stable after STEP 3 proceed to STEP 4)

→ Maintenance recall (STEP 4) – individually tailored intervals from 3-12 months

STEP 4

Maintenance

I: Supportive periodontal care strongly encouraged

II: Reinforce OH, risk factor control, behaviour change

III: Regular targeted PMPR as required to limit tooth loss

IV: Consider evidence based adjunctive efficacious toothpaste and / or mouthwash to control gingival inflammation

↓

Maintenance recall (STEP 4) – individually tailored intervals from 3-12 months

Defining engaging & non-engaging patients

(this is a guide)

Engaging patients

I: Favourable improvement in OH – indicated by ≥50% improvement in plaque and marginal bleeding scores OR

II. Plaque levels ≤20% & bleeding levels ≤30% OR

III. Patient has met targets outlined in their personal self-care plan as determined by their healthcare practitioner

Non-engaging patients

I: Insufficient improvement in OH – indicated by <50% improvement in plaque and marginal bleeding scores OR

II. Plaque levels >20% & bleeding levels >30% OR

III. Patient states preference to a palliative approach to periodontal care

If endpoints are not met…

Step 3: Corrective Phase

Aim: Treating those sites non-responding to the second step of therapy with the purpose of getting access to deep pocket sites, or aiming at regenerating or resecting those lesions, that add complexity in the management of periodontitis (infrabony and furcation lesions).

If periodontal pockets > 4 mm with bleeding on probing and/or deep pockets [≥ 6 mm] are still present at re-evaluation, different options for step 3 can be considered:

· Repeated subgingival instrumentation with or without adjunctive therapies.

· Access flap periodontal surgery.

· Resective periodontal surgery.

· Regenerative periodontal surgery.

REFERRAL TO PERIODONTIST

Maintenance/SPC

Step 4: Supportive Periodontal Care

Aim:

Preventing periodontitis recurrence/progression after successful completion of active treatment.

SPC must be performed in all patients.

Supportive Periodontal Care (Maintenance)

- Continuous patient monitoring following active periodontal therapy in order to maintain the clinical outcomes and prevent progression of periodontal diseases following therapy.
- Every 3–4 months to maintain treatment outcomes following APT in highly susceptible patients (Lindhe & Nyman 1984)

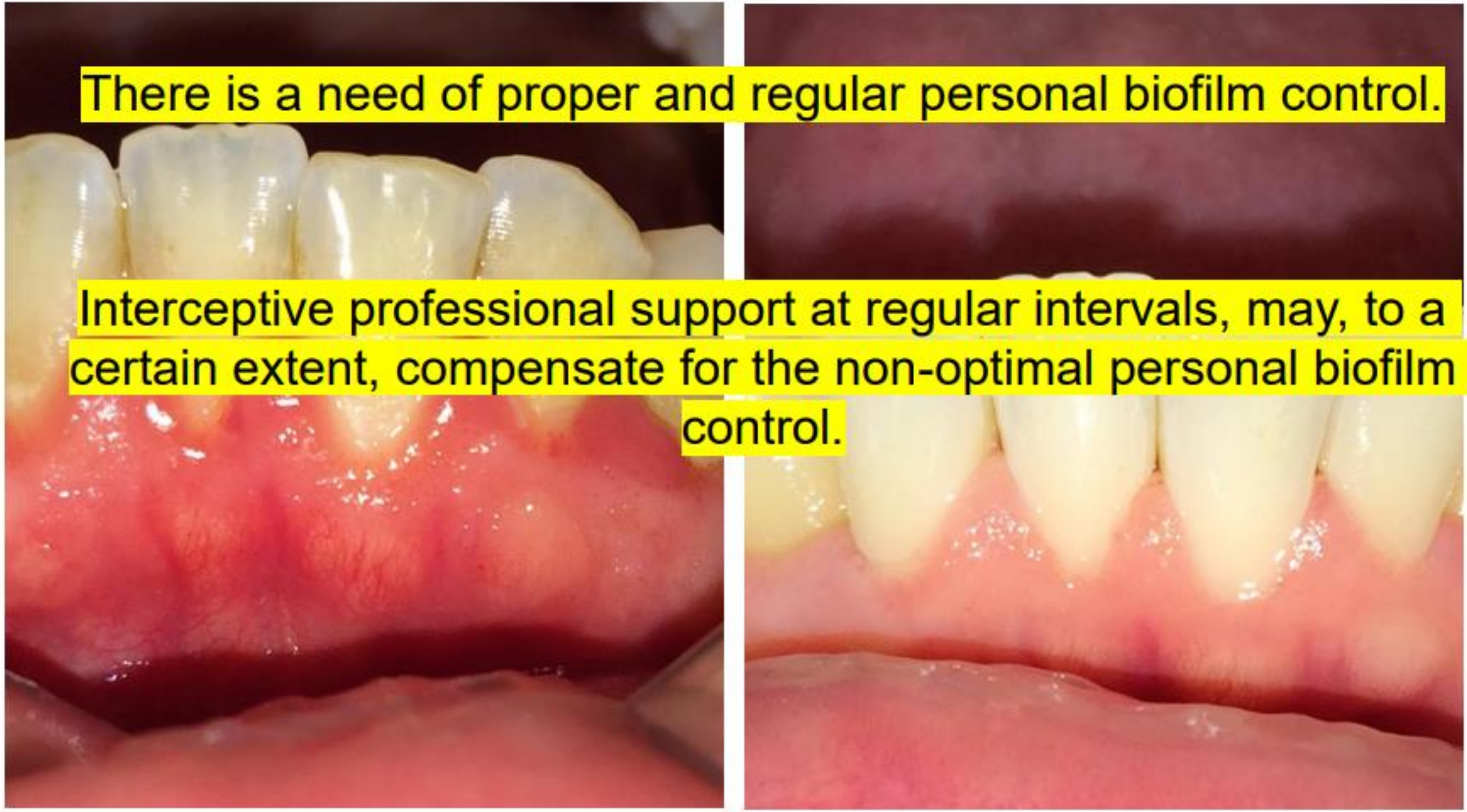
What evidence do we have?

- Lôe et al 1965 – Experimental Gingivitis in Man
- Lindhe et al 1975 – Experimental periodontitis in dogs
  - Allowed plaque accumulation in a dog model
  - NOT ALL DOGS DEVELOPED PERIODONTITIS
    - MICROBIAL COMPOSITION
    - HOST DEFENSE
    - HOST SUCEPTIBILITY
  - Periodontitis was preceded by gingivitis
  - Elimination of gingivitis can prevent occurrence of periodontitis

Role of biofilm as etiological factor for gingivitis and periodontitis

Biofilm control is key to treat gingivitis

Gingivitis treatment is a key preventive measure of periodontitis



There is a need of proper and regular personal biofilm control.

Interceptive professional support at regular intervals, may, to a certain extent, compensate for the non-optimal personal biofilm control.

Longitudinal Clinical Studies

Michigan and Gothenburg studies:

Series of clinical follow up studies on the outcome of different types of periodontal therapy where the crucial role of SPT in maintaining successful results has been documented.

- Well organized professional care program
- Regular = every 3 – 6 months
- Probing depth and attachment levels maintained

Rosling et al 1976

- Studied the healing outcome after different types of surgical periodontal treatment in patients maintained with regular professional care after 2 years.
- Rosling et al. (1976) reported that in test group of humans who had received modified Widman flap surgery and strict post-surgical oral hygiene, all two and three-wall osseous periodontal defects healed.

Nyman et al., 1977

- Studied the healing outcome after different types of surgical periodontal treatment in patients without regular professional care after 2 years.
- Resulted in recurrent periodontitis including loss of attachment 3-5x the rate documented for natural progression of periodontal disease.

Nyman, S., Lindhe, J., & Rosling, B. (1977). Periodontal surgery in plaque-infected dentitions. *Journal of clinical periodontology*, *4*(4), 240-249

Axelsson & Lindhe 1981

- 90 pts w/ adv perio
- OHI, S/RP, exo of hopeless teeth → MWF → CHX for 2 weeks, and professional mechanical plaque removal every 2 weeks for a period of 2 months
- Recall group: 2/3 retained in the Periodontal clinic for maintenance → OHI, S/RP every 2/12 for 0-2nd yr and 3/12 for 2-6th yr.
  - ALoss ≥1mm for 1% of sites
  - 0.2 tooth loss
- Non-recall group: 1/3 returned to referring dentist → unknown treatment
  - ALoss ≥1mm for 56% of sites
  - ALoss 2-5mm for 55% sites
  - PD ≥4mm 20%
  - Proximal PD ≥4mm at 32% sites
  - 0.7 tooth loss

What have we learnt from these longitudinal studies?

- Reinforces the importance of having scheduled supervised maintenance program for all periodontitis patients.
- Frequency of periodontal maintenance care for each patient will vary depending on each individual's risk for recurrence of periodontitis.

.....Leading us to discuss RISK ASSESSMENT.....

Risk Assessment

Aim of Risk Assessment

- Predict disease progression for patients during Supportive Periodontal Care (SPC) who is at risk, which tooth, which site?

Risk Assessment

- Following Active Periodontal Therapy (APT), individualised Supportive Periodontal Care (SPC) is initiated.
- The goal is to prevent disease recurrence and maintain periodontal stability.

Variability in Patient Susceptibility

- Not all treated patients have the same risk of periodontal disease progression (Rosling et al., 2001).
- Some patients require shorter intervals for SPC due to higher susceptibility.
- Risk evaluation is based on multiple clinical factors.
- No single parameter is solely responsible for determining risk.

Periodontal Risk Assessment

Comprehensive Evaluation Approach

- All risk factors should be considered simultaneously.
- A structured framework enhances clinical decision-making.

→ **Functional Diagram (Lang & Tonetti, 2003)**

- Developed to systematically assess risk.
- Incorporates key parameters influencing periodontitis recurrence.

Assessment of Periodontitis Recurrence Risk

- Patient-level percentage of bleeding on probing (BoP)
- Prevalence (number) of residual pockets ≥4 mm following active periodontal therapy
- Loss of teeth from a total of 28 teeth
- Loss of periodontal support in relation to the patient's age
- Systemic and genetic conditions
- Environmental factors such as cigarette smoking.

READ ME

Lang, N. P., & Tonetti, M. S. (2003). Periodontal risk assessment (PRA) for patients in supportive periodontal therapy (SPT). *Oral Health Prev Dent*, *1*(1), 7-16.

Percentage of Bleeding on Probing (BoP) Sites

- BoP = Objective inflammatory marker (*Loe & Silness, 1963*).
- Used to assess risk of disease recurrence and patient compliance with biofilm control.
- No universally established BoP threshold for high risk, but:
- Ramseier et al. (2015): Patients with BoP ≤ 20% maintained stability for 5 years.
- Claffey et al. (1990), Badersten et al. (1990):
    - <10% BoP → Low risk for recurrence.
    - >25% BoP → High risk for recurrence.

Prevalence of Residual Pockets (≥5mm)

• Matuliene et al. (2008): Retrospective study on periodontal disease progression and tooth loss over 11 years.

• Odds ratios for tooth loss based on probing depth (PD):

- PD 5mm: 5.8 (site-level), 7.7 (tooth-level).
- PD 6mm: 9.3 (site-level), 11.0 (tooth-level).
- PD 7mm: 37.9 (site-level), 64.2 (tooth-level).

• Key finding: Presence of ≥1 site with PD >6mm + BoP ≥30% significantly increases risk of tooth loss.

Tooth Loss

1. Importance of Remaining Teeth

- The number of remaining teeth reflects dental functionality.
- Mandibular stability and function can be maintained with a shortened dental arch (premolar to premolar occlusion = 20 teeth) (*Witter et al., 1990, 1994*).
- No increased risk of mandibular dysfunction with a shortened dental arch.

2. Impact of Tooth Loss on Oral Function

- Loss of >8 teeth (excluding third molars) leads to impaired oral function (*Käyser, 1981, 1994, 1996*).
- Tooth loss is a key outcome measure, reflecting a patient's history of:
    - Oral diseases
    - Trauma

3. Risk Assessment Based on Tooth Loss

- Number of lost teeth (excluding third molars) = Risk indicator in periodontal risk assessment.
- Critical thresholds for risk categorization:
    - Low risk: Up to 4 teeth lost
    - High risk: More than 8 teeth lost
- Rationale:
    - Further tooth loss impacts overall dentition function.
    - Preservation of remaining teeth is crucial for maintaining oral health and function.

Radiographic Bone Loss & Age

- Extent & rate of bone loss provide insight into disease progression risk.
- Helps guide SPC interval selection.

Systemic Conditions

Diabetes Mellitus:

- Affects periodontal disease progression and recurrence.
- Poor glycemic control increases risk.

Genetic Factors (IL-1 Genotype):

- IL-1 positive individuals exhibit more advanced periodontitis lesions.
- May require more frequent SPC.

Smoking (Cigarettes)

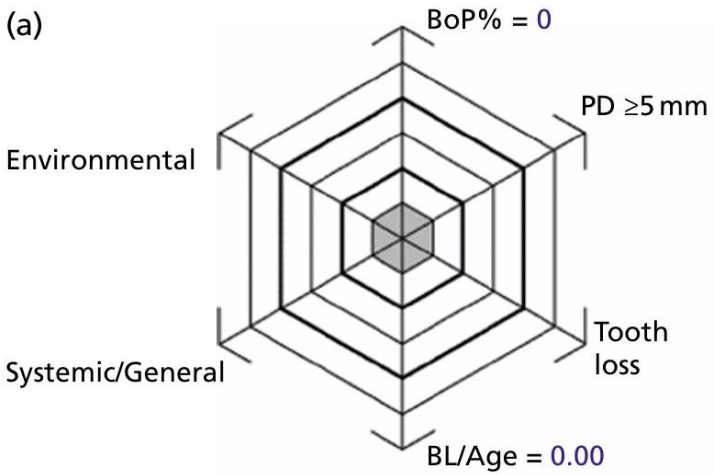
Increases disease susceptibility and worsens treatment outcomes.

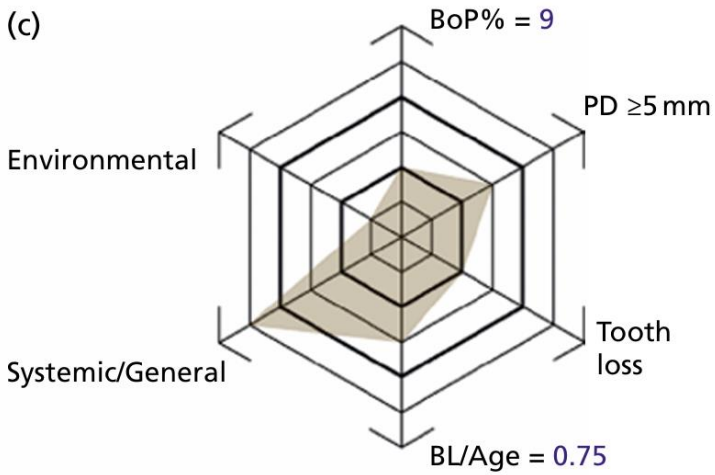
Baumert-Ah et al. (1994): Smokers have less favorable healing responses at reevaluation and after 6 years of SPT.

Baumer et al. (2011):

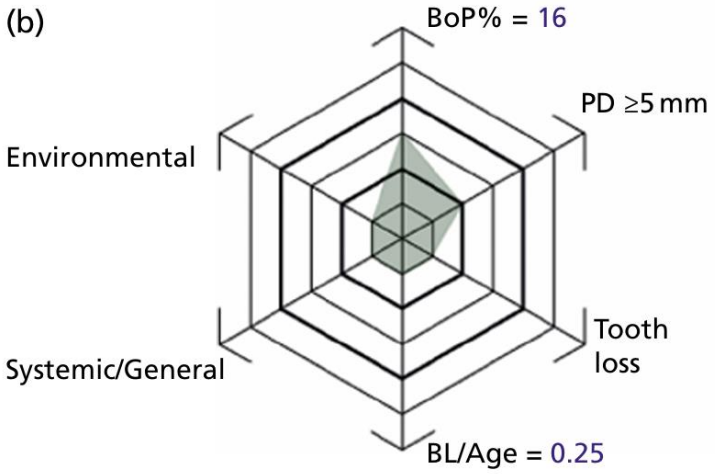
- Heavy smoking = Significant risk factor for periodontal recurrence after 10.5 years of SPT.
- Smokers need shorter SPT intervals to compensate for increased risk.

Functional Diagram

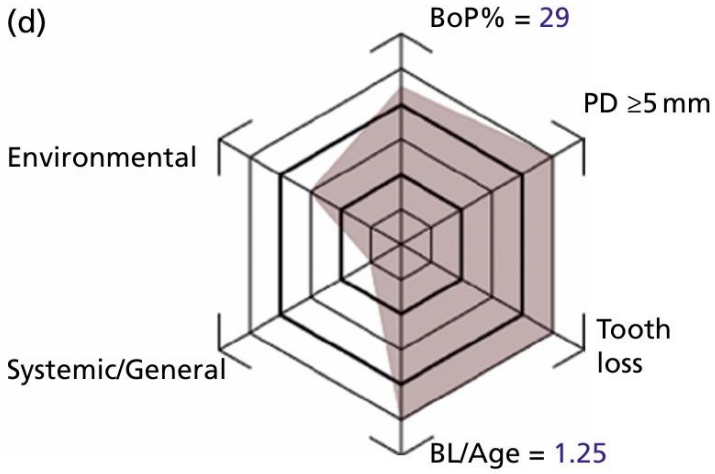




Medium-Risk



Low-Risk



High-Risk

Matuliene et al., 2010

Matuliene et al. 2010 “Significance of periodontal risk assessment on the recurrence of periodontitis and tooth loss.”

- Retrospective study
- 160 pts treated with active therapy and in SPT
- Recurrence of periodontitis: 18.2% in low-risk, 42.4% in moderate-risk, 49.2% in high-risk
- 1.61 teeth/pt lost during SPT
- TL: 1.18/pt in low-risk, 1.02/pt in mod-risk, 2.59/pt in high-risk
- TL in compliant pts 1.07 vs. non-compliant 3.11
- High-risk profile according to PRA associated with recurrence
- SPT >10yrs also associated with recurrence

Ramseier et al., 2019

- Retrospective study. 883 patients

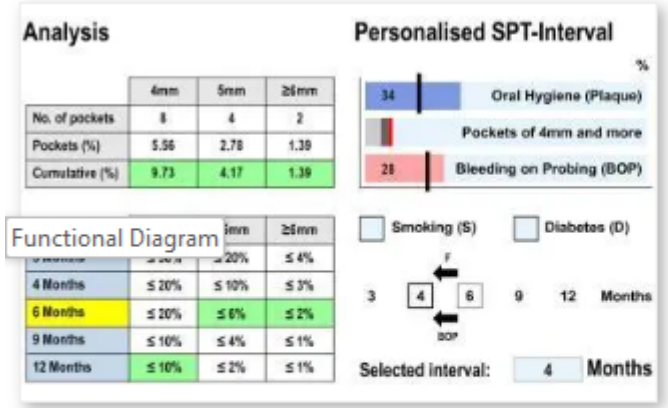
Key Findings:

Impact of Time Between SPT Visits on Periodontal Stability

- Longer intervals between SPT visits were linked to:
  - Higher residual PPDs
  - Increased risk of periodontal disease progression
  - More frequent tooth loss
- Shorter intervals between SPT visits led to:
  - Improved periodontal stability
  - Lower mean % of PPDs ≥4mm
  - Reduced frequency of tooth loss over 20 years
- Patients returning >50% of visits earlier had:
  - Lower PPDs after 5 years ($p = 0.0002$)
  - Fewer teeth extracted after 20 years ($p < 0.0001$)

Ramseier, C. A., Nydegger, M., Walter, C., Fischer, G., Sculean, A., Lang, N. P., Salvi, G. E. (2019). Time between recall visits and residual probing depths predict long-term stability in patients enrolled in supportive periodontal therapy. Journal of Clinical Periodontology, 46(2), 218-230. doi:10.1111/jcpe.13041.

Perio-Tools



Functional Diagram

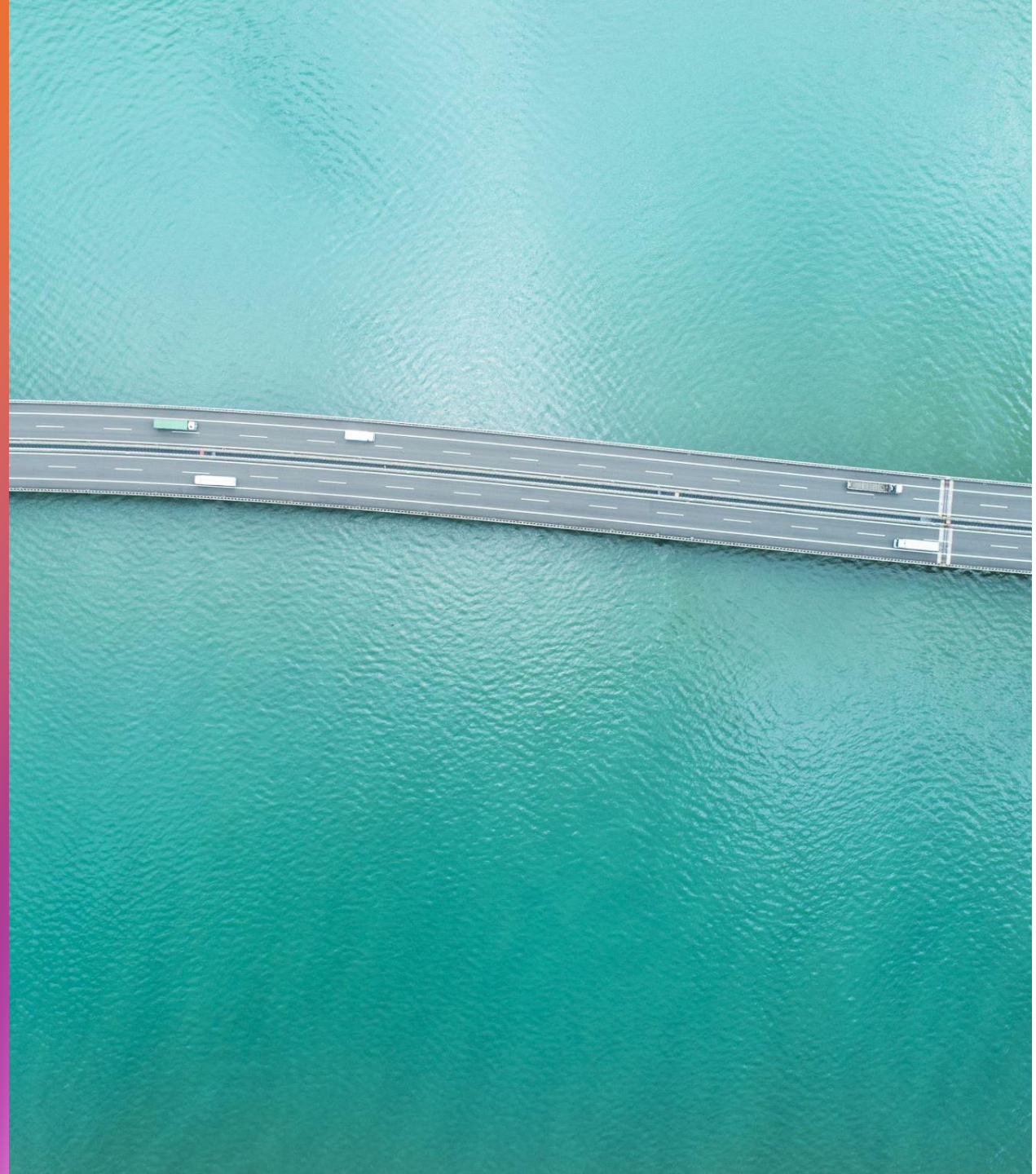
Supportive Periodontal Therapy (SPT)

The goal of the online **supportive periodontal therapy (SPT) interval tool** is to offer suggestions for scheduling subsequent intervals for SPT.

START HERE ...

We currently offer this tool in 6 languages.

+ Languages



Thank You