A STUDY GUIDE

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Foreword

Becoming certified by the American Board of Periodontology (ABP) is an immense honor and an outward sign of a dedication to the specialty of periodontics and a drive to excel within the profession. According to the American Academy of Periodontology, the ABP “evaluates standards of periodontic practice by examining the qualifications and competence of periodontists who voluntarily apply to the board for certification as diplomates.” After successful completion of a written qualifying examination, a candidate is considered board eligible and must then complete an oral examination in a defined period of time. The ABP defines a diplomat as “a periodontist who has made significant achievements beyond the mandatory educational requirements of the specialty and who is certified by the ABP.” This reinforces board certification as a sign of dedication to the specialty and of commitment to become the best periodontist possible.

To be educationally qualified for board certification, a candidate must be a certified dentist who has completed an accredited 3-year educational program in periodontology. The written and oral board examinations are comprehensive, covering all phases of periodontal health and disease and its diagnosis, treatment, and evaluation. In fact, the mission of the ABP is to “advance the art and science of periodontics and elevate the quality of periodontal care through the examination, certification, and recertification of periodontists and by encouraging the achievement and maintenance of diplomat status.” Thus, one can appreciate that mastery of the body of knowledge required to complete the written and oral examinations is intimidating and overwhelming! Periodontal Review by Dr Deborah Termeie is an organized, detailed, and well-documented compilation of information designed to help candidates navigate the board certification examinations.

There are many periodontal specialty programs across the United States, and while each covers the components mandated by the Commission on Dental Accreditation of the American Dental Association, variation exists between programs because of different faculties and diverse patient experiences. Therefore, a comprehensive well-documented study guide can help standardize the information provided in the various educational programs. More important, the body of knowledge that one must know to become board certified is overwhelming, and as more publications in the peer-reviewed literature become available every year, this body of knowledge grows exponentially. Learning the necessary material seems impossible. These are just two reasons why this study guide is helpful.
In the past, study to become board certified would require months of preparation just to figure out how to organize the literature to understand the critical information. Dr Termeie has done this task for you. Chapters cover diverse topics of periodontology, including health and disease conditions and therapeutic options, and the information is presented in an easy-to-understand question and answer format. The detail for treatment options alone is impressive; it includes nonsurgical and surgical therapy, chemotherapeutics, lasers, occlusal therapy, and bone and implant therapy for replacing missing teeth. Dr Termeie includes other material relevant to the board candidate, such as evidence-based medicine and dentistry, related human physiology and pathology, pharmacology, and oral medicine and pathology.

Another helpful aspect to this study guide is that Dr Termeie often provides data for and against a question in a concise and understandable format. Additionally, simple diagrams, tables, and charts are used throughout, which makes the text easy to understand even when discussing difficult topics. Dr Termeie also provides clinical examples that demonstrate how patient cases are documented and presented during the board examinations.

Collectively this study guide provides a comprehensive and well-organized review of major concepts in the field of periodontology and can be used either to start the studying process or as a self-examination review prior to taking the examinations. I believe that this study guide will be an essential tool for anyone who is going through the periodontal certifying board examinations or the board recertification examination or who would like to have a comprehensive reference guide in periodontology. I would like to thank Dr Termeie for the time and effort that she expended to compile this information and for making it comprehensive, organized, and easy to understand. Present and future periodontal diplomates will be much better prepared due to this effort by Dr Termeie.

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Preface

As periodontal residency graduates embark on their journey to board certification, many of them come face to face with a plethora of study materials and information but no comprehensive study resource designed to help them prepare for their examinations. *Periodontal Review* was specifically written to address this void.

The material in this book is presented in a question and answer format for ease of study. The classic literature is cited as well as more recent and practical literature on topics such as diagnosis, nonsurgical therapy, surgical therapy, regeneration, and implants. Literature evidence for opposing viewpoints is also presented throughout the book. Additionally, each chapter contains clear and relevant tables, illustrations, and pictures. This comprehensive and yet concise approach to periodontics is aimed at preparing the candidate for periodontal examinations and clinical practice.

*Periodontal Review* is a useful resource for residents, practicing periodontists preparing for board certification, dental students, and dental hygiene students seeking a broader appreciation and in-depth understanding of periodontics. Topics chosen are those emphasized in periodontal residency graduation examinations as well as the oral examination of the American Board of Periodontology.

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About the Author

**Deborah A. Termeie,** DDS, is a clinical instructor in the Department of Periodontics at UCLA in Los Angeles, California. She is a diplomate of the American Board of Periodontology (ABP), and it was her experience preparing for the ABP qualifying exams that inspired her to write this book. Dr. Termeie has published on the topic of evidence-based dentistry and is the recipient of several awards, including the Excellence in Implantology Research award from the California Society of Periodontics. She maintains a private practice in Beverly Hills, California.
**Classification**

**Q: Describe the Hamp classification.**

The classification by Hamp et al\(^3\) involves a horizontal measurement:

- **F0:** No furcation involvement.
- **F1:** The probe can penetrate the furcation less than 3 mm.
- **F2:** The furcation can be probed greater than 3 mm, but it is not a through and through furcation involvement.
- **F3:** Through and through furcation involvement.

**Q: Describe the Glickman classification.**

The Glickman\(^4\) classification is presented in Fig 3-1.

**Grade I**
- Incipient suprabony lesion.
- Radiographic changes are rarely found.

**Grade II**
- Furcation bone loss with a horizontal component.
- Radiographs may not show bone loss in the furcation.

**Grade III**
- A through and through lesion (bone is not attached to the fornx of the furcation) that is not clinically visible because it is filled with soft tissue.
- Radiographs show a radiolucency in the furcation.

**Grade IV**
- A through and through lesion that is clinically visible. The soft tissue has receded apically.
- Radiolucency is clearly visible in the furcation area.

**Fig 3-1** Glickman classification.
Q: Describe the Tarnow classification.

The classification by Tarnow and Fletcher is a subclassification of the Glickman furcation classification that measures the vertical probing depth from the roof of the furca:

- A: 0 to 3 mm
- B: 4 to 6 mm
- C: Greater than 7 mm

Treatment Options

Q: What are the treatment options for furcation defects?

- Nonsurgical debridement
- Surgical debridement
- Surgical exposure of the furcation
- Regeneration (guided tissue regeneration [GTR] and enamel matrix derivative [EMD])
- Extraction
- Root resection
- Tunnel preparation

Q: Is open/closed flap scaling and root planing effective in furcation lesions?

A review by Cobb demonstrated a less favorable response to scaling and root planing by molars with furcation involvement compared with those without furcation lesions and single-rooted teeth. He surmised that this was related to the inability to remove all pathogenic microbial flora due to the furcal anatomy restricting access for mechanical therapy.

Bower found that 81% of the time the furcation entrance is 1 mm or less. The study also found that 58% of the time the furcation entrance is 0.7 mm or less. The blade width of commonly used periodontal curettes is 0.75 mm. The ultrasonic (smaller) tip would fit better than the tip of a Gracey curette in a grade II or III furcation.

Wylam et al found no significant difference between open and closed flap root planing. The study further concluded that root planing is inefficient in the debridement of furcation lesions and does not allow for periodontal regeneration.
Diagnostic Process

Q: **What are some important factors when determining a diagnosis?**

The medical history questionnaire and examination are vital and should include the factors listed in Fig 6-5.

![Fig 6-5 Factors to be included in a medical health questionnaire.](image)

Q: **In which situations are biopsies required?**

- A cancerous lesion is suspected
- A positive histologic diagnosis has implications for other body systems
- The lesion being diagnosed has variable clinical histologic features

If in doubt, the dentist should always refer.

Radiographs

Q: **What may be some important signs seen in radiographs that suggest periodontal disease?**

Radiographic signs of periodontal disease may include:

- Break/fuzziness in lamina dura
- Wedge-shaped radiolucency
- Crestal fuzziness may be an early sign of angular bone loss

Q: **Are radiographs an accurate method of diagnosing periodontal disease?**

Ortman et al found that the unaided eye is able to detect radiographic changes when approximately 50% of the bone has been lost (Fig 6-6).
Deas et al\textsuperscript{14} found that the furcation arrow is an accurate predictor of furcation invasion 70\% of the time. However, when furcation invasions are known to be present, the furcation arrow is seen in less than 40\% of sites.

**Q:** What alveolar crest level represents bone loss on a bitewing radiograph?

Hausmann et al\textsuperscript{15} suggested that the radiographic threshold for crestal bone loss is greater than 2 mm from the CEJ to the alveolar crest on bitewing radiographs.

**Q:** Are digital radiographs equivalent to conventional radiographs in revealing bone loss?

Digital radiographs have dose advantages and are able to enhance images. Khocht et al\textsuperscript{16} noted that digital radiographs showed a higher number of sites with bone loss than did conventional radiographs. Bruder et al\textsuperscript{17} found that digital radiographs saved time, exposed the patient to less radiation (50\% to 60\%), allowed versatility in viewing the image, and produced no chemical waste.

**Q:** When should cone beam computed tomography (CBCT) be used?

According to the American Dental Association,\textsuperscript{18} “clinicians should perform radiographic imaging, including CBCT, only after professional justification that the potential clinical benefits will outweigh the risks associated with exposure to ionizing radiation. All radiographic examinations should be indicated clinically and justified appropriately.”

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**Fig 6-6** Radiograph of a patient with bone loss.
Q: Describe the prognostic classification by Kwok and Caton.\textsuperscript{6}

The Kwok and Caton\textsuperscript{6} classification system is based on the probability of disease progression. The four proposed classifications are shown in Fig 7-2.

They identified the following general factors:

- Amount of patient compliance.
- Cigarette smoking: Smokers have a greater prevalence of periodontal disease and bone loss.
- Diabetes mellitus: Patients with diabetes have a greater prevalence of periodontal disease and attachment loss.
- Other systemic conditions (neutrophil dysfunction, Papillon-Lefèvre syndrome, Down syndrome, and immunologic dysfunctions).

They further identified the following local factors:

- Deep probing depths and attachment loss
- Anatomical plaque-related factors (furcation involvement, enamel pearls, cervical enamel projections, open contacts, crowding, root proximity, and overhanging restorations)
- Trauma from occlusion and parafunctional habits
- Root fractures (Fig 7-3)
- Mobility

![Fig 7-2 Kwok and Caton\textsuperscript{6} classification.](image)

![Fig 7-3 Hopeless tooth with a vertical root fracture.](image)
Prognosis of Different Diseases and Therapies

Past Periodontitis and Its Effect on Prognosis

Q: Is there any harm in not extracting hopeless teeth when treating a periodontitis patient?

DeVore et al\(^7\) studied 17 patients who received open flap debridement with frequent maintenance on retained hopeless teeth. The study found that retained hopeless and periodontally compromised teeth have no effect on the proximal periodontium of adjacent teeth prior to and following periodontal therapy.

Machtei et al\(^8\) studied 145 teeth and concluded that retained hopeless teeth (with severe periodontal breakdown) without periodontal treatment had a negative effect on the adjacent teeth. They found that it was 10 times more likely for the adjacent teeth to have bone loss.

Q: Does a history of periodontal disease predispose to future disease?

McGuire and Nunn\(^9\) found a strong association between prognosis and initial probing depth, furcation involvement, and mobility.

Prognosis of Different Diseases and Therapies

Q: What is the prognosis of a patient with necrotizing ulcerative gingivitis, necrotizing ulcerative periodontitis, and localized aggressive periodontitis?

• Necrotizing ulcerative gingivitis: Good prognosis with the control of plaque and secondary factors.
• Necrotizing ulcerative periodontitis: Many are immunocompromised; prognosis depends on systemic factors.
• Localized aggressive periodontitis: Good prognosis with treatment.

Q: What is the prognosis of a tooth that has been diagnosed with a furcation lesion?

Cobb\(^10\) reported that over a 15-year period, 19% to 57% of teeth with furcation lesions and only 5% to 10% of teeth without furcation lesions were lost.

Ramfjord et al\(^11\) discovered that 16 of 17 teeth extracted in 5 years during maintenance and following active treatment initially presented with furcation involvement.
**Q: What is distraction osteogenesis?**

Distraction osteogenesis is based on the concept that new bone fills a gap created when two pieces of bone are separated slowly under tension. It is important to have a minimum of 6 to 7 mm of bone height above vital structures. The ridge defect should be greater than 3 to 4 mm, and the edentulous ridge span should be three or more missing teeth. Figure 12-9 presents the phases of distraction osteogenesis.

**Fig 12-9** Distraction osteogenesis phases.

**Q: What are the options for horizontal ridge augmentation?**

- Bone and membrane (Fig 12-10): Fuggazotto completed 289 ridge augmentation surgeries. Various configurations of Gore-Tex membranes were used in addition to various nonautogenous particulate materials. Of the 289 augmented ridges, 279 had adequate regenerated hard tissues for implant placement in ideal prosthetic positions. The horizontally augmented ridges had a success rate of 97%.

**Fig 12-10** (a) Allograft material placed for horizontal augmentation. (b) Membrane placed over the allograft for horizontal augmentation.
Considerations for Regeneration

• Autogenous block graft (e.g., tuberosity, chin, and lateral ramus).
• Ridge splitting (Fig 12-11): When doing the procedure, it is important to prevent fracture of the buccal plate. Sethi and Kaus performed a 5-year study evaluating 449 implants placed in maxillary ridges expanded by the ridge-split technique. The study revealed a survival rate of 97%. According to McAllister and Haghighat, the avoidance of a separate donor site with the ridge-split technique, whether it uses particulate, block graft, or GBR, and its associated reduced treatment time and morbidity represent its primary advantage compared with other lateral augmentation techniques.

Fig 12-11 (a) Ridge split with direction indicators. (b) Ridge split with implants placed.

• Distraction osteogenesis: Laster et al treated nine patients with distraction osteogenesis, increasing the alveolar width from 4 to 6 mm. Of the 21 implants placed, 20 implants successfully osseointegrated. After 12 months’ follow-up, no marginal bone resorption was observed. They listed soft tissue expansion, high dimensional stability, reduced treatment time, and the avoidance of a graft as the advantages of horizontal distraction compared with block grafting.
• Block allograft: Because allograft is not living bone, it must be hydrated, and air bubbles must be removed. Nissan et al did a study on 40 patients (83 implants) with 60 cancellous freeze-dried bone block allografts. The study had an average percentage of newly formed bone of 33% and implant survival of 98.8%. In a two-stage implant placement procedure, cancellous bone block allograft is osteoconductive and biocompatible, allowing new bone formation following augmentation of extremely atrophic anterior maxillae.

Esposito et al conducted a systematic review and observed no statistically significant differences when comparing various horizontal augmentation techniques.
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