The Preventive Angle
Preventive & Hygiene Insights from The Richmond Institute

Volume VI, Issue II
newsletter@youngdental.com
US $10.00

In This Issue:

Abstract:

Periodontal Disease poses a significant challenge to the patient and the oral healthcare professional alike. Risk behavior associated with Periodontal Disease must be properly identified and assessed by the care provider before the patient can begin to adopt healthy oral management techniques. Implementation of an effective oral management plan, however, is easier said than done. The "why" is as important as the "how" in educating a patient on risk management. This issue of The Preventive Angle addresses the major risk factors for Periodontal Disease and offers strategies for oral healthcare professionals to use in helping establish a balanced, preventive oral management plan.

Learning Objectives:

After reading this article the reader should be familiar with:

- The four major risk factors and other lesser factors contributing to Periodontal Disease.
- Observed relationships between Periodontal Disease and aspects of overall patient health.
- What types of risk behaviors are preventable, and strategies to help patients improve their periodontal health.

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YOUNG DENTAL MANUFACTURING

Risk Factors For Periodontal Disease

Margaret J. Fehrenbach, RDH, MS

Introduction

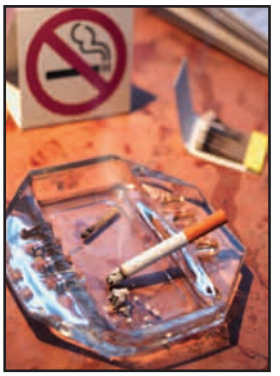
With an understanding of the risk factors for Periodontal Disease (PD), a treatment plan to modify, control or eliminate most of these factors can be created. Without proper calculation of risk, an estimation of a given patient's risk of PD can prove variable and unreliable. Even patients exhibiting strong protective factors for good health including an active immune system, are susceptible to the damage induced by the risk factors outlined in this article.[1] The goal of the oral healthcare professional is to guide patients toward a healthy balance of preventative oral management and the most prevalent risk factors for PD.

With each patient risk assessment, a consistent baseline of risk can be established, leading to more uniform and predictable treatment strategies our patients.[2] As Kenneth A. Krebs, DMD, former president of the American Association of Periodontists (AAP) states, "Risk assessment is an important component of modern dental therapy. Identification of subjects with the greatest risk for periodontal disease severity and progression is essential for the proper allocation of preventive therapeutic measures to those individuals who would benefit most from such measures."

A recent study detailed the four major risk factors of tooth loss due to PD.[3] The four identified PD risk factors included the age of the patient, their smoking frequency, diabetes mellitus, and the presence of an abnormal oral environment. Recently, stress has also been cited as a risk factor for PD. Other factors identified include a patient's gender, hormonal influences, genetics, nutritional state, and certain diseases, such as osteoporosis or HIV. Today there are software programs that help the clinician quickly calculate a patient's risk of oral disease based on their medical and dental history.[4,5]

Age Risk

As people age, their risk for developing PD increases. Over half of American adults have gingivitis—a less severe form of PD—surrounding three to four teeth, and nearly 30 percent have significant PD surrounding three to four teeth.[3] In a study of people over 70 years old, 86 percent had at least moderate periodontitis, a severe form of PD, and over one-fourth of this 86 percent had lost their teeth. The study also showed that the disease accounted for a majority of tooth extractions in patients older than 35 years of age.[6]



Tobacco Use Risk

Current and past smokers accounted for almost 31 percent of patients with tooth loss.[3] In the last decade there have been many studies that show a correlation between smoking and the severity of periodontal pathology.[7] A number of studies indicate that the nicotine found in tobacco products triggers the overproduction of cytokines in the body due to lowered oxygen levels.[8] Cytokines are signaling chemicals

involved in the process of periodontal inflammation. When nicotine combines with oral bacteria, such as P. gingivalis, the effect is even higher levels of cytokines, leading to breakdown in the supporting tissues of the teeth.

Studies suggest that smokers are 11 times more likely than non-smokers to harbor the bacteria that cause PD and 4 times more likely to have advanced PD. In one study, over 40 percent of smokers had lost their teeth by the end of their lives.[9] The risk of PD increases with the number of cigarettes smoked per day. It is important to note that smoking cigars and pipes carries the same risk as smoking cigarettes. Exposure to second-hand smoke is associated with a 50 to 60 percent increased risk for developing PD.[10] When smokers quit, their PD gradually recovers to a state comparable to that of non-smokers.[9]

Diabetes Mellitus Risk

The disease most commonly found in medical histories of patients with tooth loss is diabetes mellitus at over 19 percent.[3] There is much evidence showing a link between types 1 and 2 diabetes and PD. People with these diseases have 15 times the risk of the non-diabetic population.[11]

Diabetes causes abnormalities in blood vessels and high levels of interleukins, a group of cytokines (discussed earlier). Both of these complications significantly increase the chances of PD. In addition, high levels of triglycerides, specific fats in the blood, are common in type 2 diabetes and appear also to impair periodontal health.[12] Also the high blood sugar, the hallmark of diabetes, has even been associated with severe PD in people without diabetes.[13] Obesity, which is common in type 2 diabetes, may also predispose a person to PD.[14,15]

Abnormal Oral Environment Risk

Self-reported brushing frequency of patients with tooth loss is low, with only 16 percent brushing their teeth twice or more daily. Almost 60 percent of respondents with tooth loss either never brushed their teeth, or brushed irregularly. This lack of oral hygiene encourages bacterial build-up and biofilm plaque formation, and can also increase certain species of pathogenic bacteria associated with more severe forms of PD.[3]

Abnormal tooth structure can also increase risk, as can abnormal oral habits. Clenching and bruxism (grinding) can put excess force on the periodontium and can speed up the rate at which tissue is destroyed. Lack of adequate professional dental care also contributes to a patient's risk of PD. Over 39 percent of respondents reported that they have never had a dental prophylaxis or periodontal maintenance visit.[3] In addition, poorly contoured restorations that provide traps for debris and biofilm plaque can also contribute to PD formation.

Stress System: Risk Factor?

It has been strongly suggested that stress, related body distress, and inadequate coping are important risk indicators for PD.[16] A recent study shows that caregivers of people under physical or psychological stress, as well as those with the conditions themselves, are prone to elevated biofilm plaque levels and increased gingivitis.[17] It seems also that high levels of financial stress and poor coping abilities increase the likelihood of developing PD twofold.[18] Furthermore, it is likely that systemic diseases associated with PD, such as diabetes, cardiovascular disease, preterm delivery, and osteoporosis may share psychosocial stress as a common risk factor (see later discussion). However, a direct association between PD and stress remains unproven. And job stress does not seem to be a factor in PD progression, possibly due to social support and coping skills for most patients with high-stress careers.

Another concern is that, when coupled with a lack of adequate coping skills, ever-present stress may lead to altered oral habits, such as bruxism or reduced oral hygiene, along with salivary changes and a weakening of the body's immune system. Nick Russo, DDS, spokesperson for the Association of General Dentists (AGD), states, "There is definitely a link between stress and dental health. Stress affects the immune system which can fight the type of bacteria that causes periodontal disease, making them more prone to gingival infection."

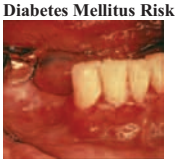
Control Risk Factors to Control Disease

According to a recent study, periodontists more frequently perform risk identification procedures and suggest oral management behaviors for patients who smoke or who have diabetes than do general practitioners. However, both types of oral healthcare professionals tend to engage more often in activities that inquire, discuss, and inform than those that actually control or manage these risk factors.[19] Because of this, the need is great to increase both periodontists' and general practitioners' involvement in the active management of risk factors for PD. Such actions can be expected to result in improved periodontal health for patients. Studies show that high adherence levels can be achieved for the patient with a clearly defined, comprehensive, supportive periodontal care program.[20]

While the age of a patient cannot be altered, the other major PD risk factors can be controlled. Smoking is the most preventable of the major risk factors. For more information, please see *The Preventive Angle* Volume V, Issue III, "Tobacco Cessation Efforts Save Lives in the Dental Office," viewable at www.youngdental.com.

In addition, controlling types 1 and 2 diabetes may also help reduce periodontal risk. For more information, please see *The Preventive Angle* Volume IV, Issue III, "Dental Care for the Diabetic

Table 1

FOUR MAIN RISK FACTORS FOR PERIODONTAL DISEASE	
RISK FACTOR	**KEY POINTS**
Age Risk 	As people age, their risk for developing PD increases. While the age of a patient cannot be altered, the other major risk factors *can* be controlled.
Tobacco Use Risk 	Smoking can cause bone loss and gingival recession; Exposure to second-hand smoke increases PD risk. Smoking is the single major preventable risk factor.
Diabetes Mellitus Risk 	The most common medical history found in patients. Controlling diabetes may also help reduce risk.
Abnormal Oral Environment Risk 	Abnormal Oral Environment Risk is one of the most difficult risk factors to control on a day-to-day basis but can be the easiest to implement if the patient is willing to *accept responsibility for his or her own oral health.*
Stress System: Risk Factor? 	PD has been strongly suggested that stress and related body distress, as well as inadequate coping mechanisms, are important risk indicators. Systemic diseases associated with it may share psychosocial stress as a common risk factor. Once stress levels are reduced in the patient, the present conditions usually improve.

Patient," viewable at www.youngdental.com.

It can be said with some degree of certainty that no patient wants to lose his or her smile, and that preventive oral care has a strong protective effect against biofilm plaque. One of the most difficult risk factors to control on a day-to-day basis is the abnormal oral environment, yet it may be the easiest to stabilize if the patient is willing to accept responsibility for his or her own oral health. This means that they must implement proper home care, regularly visit the dental office and proceed with any necessary dental care.[21] Dental professionals should give patients proper information on how to maintain oral health and should offer regular maintenance appointments. Because the decision to take preventive measures is that of each patient, a strong relationship between the treating dental professional and the patient is essential. Additionally, if a patient's stress levels can be reduced, their periodontal health may improve.[22] It is important for the dental professional to help each patient identify his or her stress-related risk factors, to encourage them to develop positive coping behaviors, and, if necessary, to seek professional therapy.

General Health through Oral Health

It is important to keep in mind that when PD is controlled, other areas of a patient's health may improve. Improvement has been observed alongside improved oral health in patients with several chronic, degenerative diseases including diabetes, coronary artery disease, and cerebrovascular disease.[23,24] Dr. Robert Schoor, former president of the AAP said this of the observed link between oral and systemic health: "The good news is that many of the risk factors for periodontal disease, such as poor oral hygiene and infrequent professional care, can be controlled with minimal personal time and financial resources. And because eliminating periodontal disease also eliminates a risk factor for heart disease, respiratory disease, and diabetes complications, it is especially important for people to do what they can to protect their oral health." Thus, the important message to send to all patients is that oral health promotes general health.

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Websites

Smoking Cessation Program, American Dental Hygienists' Assocation: **www.askadviserefer.org**

Assess Your Risk for Periodontal Disease, American Academy of Periodontology: **www.perio.org/consumer/4a.html**

Smoking & Periodontal Disease: The Real Drag, Fehrenbach MJ, DentAssist, Online Dental CE: **www.dentassist.com/**

Periodontal (Gum) Disease: Causes, Symptoms, and Treatments, NIDR:
www.nidcr.nih.gov/.../PeriodontalDiseases.htm

The Oral-Systemic Health Connection, NIDR:
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The American Institute of Stress:
www.stress.org/

Medline Plus on Stress:
www.nlm.nih.gov/medlineplus/stress.html

CE Questions:
Risk Factors For Periodontal Disease

Test Instructions—Please fill in the bubble corresponding to the answer you believe to be correct for each question. Mail or fax completed tests to the Richmond Institute to receive CE Credit.

1. Which of the following is not a main risk factor for periodontal disease?
   a. Stress
   b. Smoking
   c. Tooth number
   d. Age

2. What percentage of Americans have gingivitis?
   a. 20%
   b. 30%
   c. 40%
   d. 50%

3. Cytokines are signally chemicals that are directly involved in:
   a. Pus production.
   b. Inflammation.
   c. Decreased bacteria.
   d. Collagen production.

4. What percentage of increased risk is associated with second-hand smoke?
   a. 5-10%
   b. 10-20%
   c. 30-40%
   d. 50-60%

5. Which of the following substances are noted in increased levels in diabetic patients?
   a. Triglycerides
   b. Blood sugar level
   c. Interleukins
   d. All of the above

6. What percentage of patients brush their teeth twice or more daily?
   a. 56%
   b. 36%
   c. 26%
   d. 16%

7. Which of the following can increase the risk of periodontal disease in patients?
   a. Grinding
   b. Clenching
   c. Poorly contoured restorations
   d. All of the above

8. Which of the following possibly increase when a patient is under psychological or physical stress?
   a. Increased health of the periodontium
   b. Increased biofilm plaque levels
   c. Decreased gingivitis
   d. All of the above

9. Which of the following can best lead to improved periodontal health outcomes for your patients?
   a. Inquire about risk factors
   b. Discuss risk factors
   c. Inform patient of risk factors
   d. Active management of risk factors

10. Which of the following is the single major preventable risk factor for periodontal disease in your patients?
    a. Smoking
    b. Age
    c. Gender
    d. Family history

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CE Answers For: ***Risk Factors for Periodontal Disease – Volume VI, Issue II***

1.	❍A	❍B	❍C	❍D	6.	❍A	❍B	❍C	❍D
2.	❍A	❍B	❍C	❍D	7.	❍A	❍B	❍C	❍D
3.	❍A	❍B	❍C	❍D	8.	❍A	❍B	❍C	❍D
4.	❍A	❍B	❍C	❍D	9.	❍A	❍B	❍C	❍D
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