

LEARNING/TEACHING

A Model for Dental Hygiene Education Concerning the Relationship between Periodontal Health and Systemic Health

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ABSTRACT Purpose: *To develop a format for educating the appropriate health care professionals as to the relationships between periodontal inflammation and increased risks for poor diabetes control, cardiovascular disease, cerebrovascular disease, pre-term low birth weight, pneumonia and gastric ulcer reinfection.*

Materials & Methods: *Dental hygiene students in the Advanced Periodontology curriculum were instructed to review current literature regarding the increased risk for systemic health problems when periodontal inflammation is present. Abstracts of the reviewed material were then presented in group setting to all course participants. For each systemic entity (diabetes, cardio/cerebrovascular disease, adverse pregnancy outcome, pneumonia, gastric ulcer) literature-based evidence of periodontal disease's association, affect, pathogenesis, validity and clinical significance was determined. Consensus statements for each entity were developed and used as a basis for clinical interpretation. Following this, patient health-history materials were developed to obtain the necessary information from patients while educating them about the increased risk for systemic health problems when periodontal inflammation is present. Lastly, correspondence materials were developed to alert managing physicians and medical auxiliaries about the increased risk for systemic problems in their patients who may present with periodontal inflammation. A methodology which medical personnel can use to quickly screen for the presence of periodontal inflammation in at-risk patients was also developed in these correspondences.*

Conclusion: *An educational model and clinical materials were developed which are aimed at alerting patients, dental and medical personnel to the increased risk for systemic health problems when inflammatory periodontal disease is present.*

KEYWORDS *Interdisciplinary, periodontal disease, systemic health.*

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Introduction

Emerging data are strongly linking periodontal inflammation with increased risks for other systemic health problems (American Academy of Periodontology, 1998; Stamm, 1998). The involved systemic diseases are widely prevalent and exact an extensive toll on human health and the cost of health care. As such, the impact that periodontal disease can have on oral and overall health cannot be overstated. Conversely, the public health benefits secondary to achieving and maintaining an oral cavity relatively free of inflammation are potentially significant.

When periodontal inflammation is present, bacteria, bacterial byproducts and mediators of inflammation released by host cells in response to the bacteria can gain entrance to the circulatory system and have far reaching effects. The most impressive findings link ongoing periodontal inflammation with an increased risk for cardiovascular/cerebrovascular disease, poor blood glucose control in diabetics and an increased risk for pre-term low birth weight delivery in pregnant females. Additionally, the periodontal environment may act as a reservoir for pathogens which lead to pneumonia and gastric ulcer reinfection.

The importance of this information to dental professionals and the medical disciplines who interact with the affected patients suggests that any effort at reducing the inherent delay in getting useful research data such as this into the clinical setting would be prudent.

This report details the development of a periodontal-systemic health relationship educational program (PSHEP) aimed at getting the necessary information concerning the effect that periodontal disease can have on overall systemic health into the hands of the patients and the health care practitioners who could most benefit from this information. The first phase of the program focused on incorporation of current research information into the existing dental hygiene curriculum. Secondary phases involve further development of this material for use by private practice clinicians.

Program Development

Private clinical practice and dental hygiene educational disciplines were combined to develop the PSHEP in an effort to deliver the necessary information in a way that would be simultaneously applicable to patients, dental hygiene students and other health care professionals. Faculty searched the available literature and created a literature list of relevant articles (Table 1). Articles were selected based on their timeliness and content. Hard copies of these articles were put on reserve in the campus library.

In order to incorporate the PSHEP into existing curriculum, dental hygiene students were provided with this literature (as opposed to requiring student literature search and selection). Each student was assigned two articles, which

Table 1. List of literature reviewed by the students

- AAP (1998). Position paper: Periodontal disease as a potential risk factor for systemic diseases. *Journal of Periodontology*, 69, 841–850.
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- Loesch, W.J. (1994). Periodontal disease as a risk factor for heart disease. *Compendium of Continuing Education in Dentistry*, 15, 976–991.
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Table 1. (Continued)

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they were to read. Abstracts of each article were prepared by the students. Submitted abstracts were then graded by dental hygiene faculty and a private practice clinician for content and clinically applicability. The abstracts were then returned for revision. For each systemic entity (diabetes, cardio/cerebrovascular disease, adverse pregnancy outcome, pneumonia, gastric ulcer), literature-based evidence of periodontal disease's association, affect, pathogenesis, relationship validity and clinical significance was determined. After revision, final abstracts were submitted for grading. These final abstracts were presented orally to all of the students involved in this project. The intent was to develop consensus statements from these oral presentations. These consensus statements detailed the literature-supported conclusions regarding the relationships between periodontal inflammation and systemic health that were learned from the entire group. Specifically, for each clinical entity, the presented information was categorized and viewed in its totality to determine the following:

1. Is there evidence of an association between periodontal inflammation and systemic health?
2. Is there evidence of a direct effect that periodontal inflammation can have on systemic health?
3. What is the postulated pathway for this association or direct affect?
4. How reliable were the measurements of periodontal inflammation?
5. How reliable were the measurements of the studied systemic condition?
6. How significant are these findings compared to other reported findings?
7. How should this information be incorporated into the daily clinical practice?
8. For example, a consensus statement on diabetes may suggest that periodontal inflammation can adversely affect glycemic control in

diabetics. Realizing that poor glycemic control can lead to more serious systemic complications, diabetic patients should be monitored and treated aggressively for the presence of periodontal inflammation.

Clinical Phase

The review of selected literature with an emphasis on clinical relevance allowed the faculty to develop a format for providing this information to patients in the clinical setting. The goal was to develop a tool which would educate the patient to the relationship between periodontal and systemic health while eliciting from them the health-history information that the dental practitioner needs to assess and address any applicable risk factors with which the patient presents. The intent was to make such an instrument simultaneously applicable to academic and private practice settings.

The consensus statements determined in the classroom portion of the PSHEP were utilized to develop the Periodontal Risk Assessment Form (Figure 1).

Use of this form was incorporated into the dental hygiene clinic protocol. The PSHEP culminated with clinical case presentations during which students incorporated information learned from the literature review process into their actual clinical protocols. For instance, when eliciting a health history during a new patient interview, students inquired about the presence of any cardiac disease risk factors (realizing that periodontal inflammation, if present, may add to the burden of risk). They were also schooled (via lecture format detailing experiences in private practice clinical settings) in using the reported information to educate patients and their managing medical professionals of risk reduction strategies. For example, students advised patients who had other cardiac risk factors to achieve and then maintain a preferred level of oral health in an attempt to lower their overall cardiac disease risk.

In its totality, the PSHEP permits students to learn the emerging information linking periodontal inflammation with other systemic health problems. It also allows them to gain experience in critically reviewing scientific literature. Most importantly, the PSHEP provides a framework for the timely inclusion of research information into clinical practice. It is hoped that these skills will continue to be developed throughout the professional careers of participating students via continuing education programs emphasizing continual review of new research information as it emerges.

Private Practice Phase

Consensus information developed at the student level was then presented to the dental private practice community via continuing education lecture format.

A

Periodontal Risk Assessment Questionnaire for _____



TOBACCO USE

Tobacco use is the most significant risk factor for gum disease.

Do you now or have you ever used the following:

	<i>Amount per day</i>	<i>Used for how many years</i>	<i>If you quit, list what year</i>
<input type="checkbox"/> Cigarette	_____	_____	_____
<input type="checkbox"/> Cigar	_____	_____	_____
<input type="checkbox"/> Pipe	_____	_____	_____
<input type="checkbox"/> Chew	_____	_____	_____
<input type="checkbox"/> Snuff	_____	_____	_____



HEART ATTACK/ STROKE

Untreated gum disease can increase your risk for heart attack and stroke.

Do you have any other risk factors for heart disease or stroke?

Family history of heart disease Tobacco use

High cholesterol High blood pressure

If you have any of these other risk factors it is especially important for you to always keep your gums as healthy and inflammation free as possible to reduce your overall risk for heart attack and stroke.



MEDICATIONS

A side effect of some medications can cause changes in your gums.

Have you ever taken any of the following medications:

Dilantin anti-seizure medication.

Calcium Channel Blocker blood pressure medication (such as Procardia, Cardizem, Norvasc, Verapamil, etc.).

Cyclosporin immunosuppressant therapy.



GENETIC

The tendency for gum disease to develop can be inherited.

Has anyone on your side of the family had gum problems (e.g. your mother, father, or siblings):

yes No



CONTAGIOUS

The bacteria which cause gum disease may be spread to a spouse or the family.

Has anyone in your immediate family been tested or treated for gum problems? If so, whom?

Spouse Children



FEMALES

Females can be at increased risk for gum disease at different points in their life.

The following can adversely affect your gums. Please check all that apply:

Pregnant Nursing Osteoporosis

Taking birth control pills

Taking hormone supplements

Infrequent care during previous pregnancies

Figure 1. Periodontal Risk Assessment Form.

Experiences using the Periodontal Risk Assessment Form were also shared with this community permitting this information to cross over into the private practice sector (and to be appropriately used) in a timely fashion.

B



DIABETES
Gum disease is a common

complication of diabetes. Untreated gum disease makes it harder for diabetics to control their blood sugar.

IF YOU ARE DIABETIC,
For how many years? _____
Is your diabetes well controlled? yes no
Who is your physician for diabetes? _____

IF YOU ARE NOT A DIABETIC,
Any family history of diabetes? yes no
Have you had any of these warning signs of diabetes?
 frequent urination excessive thirst
 excessive hunger tingling or numbness in extremities
 weakness and fatigue slow healing of cuts
 unexplained weight loss any change in vision



Heart Murmur, Artificial joint prosthesis

If you have even the slightest amount of gum inflammation, bacteria from the mouth can enter the bloodstream and cause a serious infection of the heart muscle or your artificial joint.

Do you have a heart murmur or artificial joint?
 yes no

If so, does your physician recommend antibiotics prior to dental visits?
 yes no

Name of physician? _____
It is especially important in your case to always keep your gums as healthy and inflammation-free as possible to reduce the chance of bacterial infection originating from the mouth.



Gastric ulcers
Ulcers are caused by bacteria. When your gums are inflamed, bacteria from the mouth can travel to the gut and cause ulcers to become active. If you have been treated for ulcers you should make sure your gums are as inflammation-free as possible.

Have you ever been treated for ulcers?
 yes no

If yes,

Is the ulcer active now?
 yes no

All patients please complete the following ↷

Have you noticed any of the following signs of gum disease?

<input type="checkbox"/> Bleeding gums during toothbrushing	<input type="checkbox"/> Pus between the teeth and gums
<input type="checkbox"/> Red, swollen or tender gums	<input type="checkbox"/> Loose or separating teeth
<input type="checkbox"/> Gums that have pulled away from the teeth	<input type="checkbox"/> Change in the way your teeth fit together
<input type="checkbox"/> Persistent bad breath	<input type="checkbox"/> Food catching between teeth

Is it important to you to keep your teeth as long as possible? yes Not really
Any particular reason why missing teeth have not been replaced? _____

Do you like the appearance of your smile? yes no
Do you like the color of your teeth? yes no
Do your teeth keep you from eating any specific food? yes No

Figure 1. (Continued)

The Future

The scope of the PSHEP is being expanded. Correspondence materials have been developed in the classroom which, once refined for clinical applicability,

can facilitate dental professionals in alerting managing physicians and medical auxiliaries about the increased risk for systemic problems in their patients who may present with periodontal inflammation. A methodology which medical personnel can use to quickly screen for the presence of periodontal inflammation in at-risk patients will also be developed and presented in these correspondences. These tools, once refined, will similarly be introduced via lecture format to the dental community.

A future goal of the PSHEP is to train students and health care providers to access and assess the relevance of this emerging information themselves. It would also be useful to expose other pertinent university disciplines to this information. For example, nursing students should realize that periodontal inflammation in diabetic patients or patients with cardiovascular risk factors may take on added significance. All disciplines that interact with pregnant patients should be exposed to the information linking periodontal inflammation with adverse pregnancy outcomes. All health care personnel who manage cardiac disease risk (or any systemic condition linked to periodontal inflammation) should be educated to screen for and assess a patient's periodontal status. Facilitating communication between involved health care disciplines can only benefit the patients who present with increased systemic health risks due to periodontal inflammation.

Getting this potentially life-altering information to as many patients as possible should be the ultimate goal. Promoting an interdisciplinary approach to health management should command equal attention.

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