

# Critical Issues in Dental Hygiene

## A Center for Oral Health Promotion: Establishing an Inter-Professional Paradigm for Dental Hygiene, Health Care Management and Nursing Education

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### Introduction

Dental hygiene educational settings for students in the U.S. include programs in technical schools, community colleges, 4 year colleges, universities and dental schools. Except for programs housed in the 58 dental schools, the education is provided in separate departments and not integrated with other health care provider disciplines. As a result, students do not learn to view their profession as part of a holistic health care provider approach. In addition, dental hygiene students do not typically practice their educational and clinical skills in a setting where the principles of ideal health care management and nursing care are taught and practiced by students from other disciplines. Similarly, health care management and nursing programs are rarely developed and worked from an integrated scheme. In most cases, health care management students would have their first integration experience when they do their practicums or internships towards the end of the program. Dental hygiene and nursing students would not typically experience collaborative practice education. The ability to effectively interact with other health care professionals will be crucial to the success of health care providers in the future and needs to be addressed in the curriculum.

There are few dental hygiene/nursing inter-

### Abstract

**Purpose:** The need for education about oral health conditions has been discussed in recent years. Current research has shown correlations between oral and systemic disease. Disease entities have been connected to bacteremia and inflammatory processes, both of which can result from oral pathologies. Professionals need to be educated about these connections and advised how, by maintaining proper oral health, they may avoid systemic consequences.

Students in dental hygiene, health care management and nursing programs can play a vital role in this education. By jointly creating and operating an educational Center for Oral Health Promotion, they can better understand each other's professions. This will facilitate developing the skill set to reach out to the underserved and establish protocols to provide health literacy and care at affordable rates. They can also better appreciate the interconnections between health care delivery and its management while gaining skills needed to work in an inter-professional setting.

A Center for Oral Health Promotion would expand services typically offered in dental hygiene educational settings as well as expand dental hygiene, nursing and health care management student experiences.

**Keywords:** Dental Hygienist, Nurse, Healthcare Manager, Inter-Professional Education

This study supports the NDHRA priority area, **Health Services Research:** Determine the extent to which dental hygienists' working in collaborative practice settings with other health professionals or organizations improves the cost-effectiveness and quality of health care outcomes.

professional care programs. New York University Colleges of Dentistry and Nursing have initiated such a program. In 2005 this union was considered an "unusual combination."<sup>1</sup> The 5 dynamic pillars of this partnership include:

- Facilitating interpersonal relationships and mentorships
- Fostering and maintaining an environment for excellence
- Leveraging partnerships among dentistry, nursing and dental hygiene
- Developing men and women of science
- Promoting global activity

The program is based on the concept of increasing the value of every client appointment. Dental hygienists, nurses, physicians, dentists and other allied health providers are compelled to collaborate across disciplines.

The premise of the New York University article is that dental hygiene students work closely with nursing students in planning dental care at the College of Dentistry and to collect risk information on patients/clients. The coordination of patient care is second only to patient-centered care for dental hygiene and dental students. Nursing students take an active role in oral examinations which increases their awareness of optimum oral health. Not only are the students collaborating, the faculty of the programs are collaborating on research. The authors refer to their new program as a one stop shop approach to health care and anticipate that this model would become a national model to improve the outcome of the community's oral and general health.

As a result of the development of inter-professional care programs a survey of Oregon dental hygienists' perception of "their role in inter-professional collaboration, the barriers to effective collaboration and communication skills needed to better participate in inter-professional collaboration" was recently published.<sup>2</sup> The results of the study indicated that hygienists' perception of their role in inter-professional collaboration is valuable. Insufficient time and knowledge of medical diseases were reported as the barriers to effective collaboration. The respondents indicated that leadership skills, speaking and listening were communication skills paramount to participation in inter-professional collaboration.<sup>2</sup>

The authors of the Oregon study contend that medical professionals routinely use inter-professional collaboration in their medical decision making. Due to the oral/systemic connection, there is a need for an ever increasing collaboration among the dental and medical professionals.<sup>2</sup>

Regarding collaboration, "interdisciplinary education needs to become the expected standard in dental and medical education" and "continued

education in medical conditions that have a strong correlation to dental disease such as diabetes, cardiovascular disease and pregnancy may increase dental hygienists' knowledge and consequently increase their confidence in collaboration."<sup>2</sup>

An oral health care model to teach inter-professional education is needed. A Center for Oral Health Promotion would address the need to provide dental hygiene and nursing students with more extensive practical inter-professional experience and introduce them to the business side of health care delivery. The center would at the same time allow health care management students to have extensive contact with providers and afford them the opportunity to become acculturated to the delivery side. The proposed center, therefore, has 2 basic underpinnings: the need to have student practitioners and managers learn in an inter-professional practice setting, and further understanding of the relationship between oral and systemic health issues. This latter application will position health care provider students to better appreciate the clinical aspects of health care delivery and to understand how inter-professional approaches can produce cost savings. Clearly, one of the major challenges that health care providers will face is the need to develop strategies to produce less costly health care delivery. A major impetus in this regard could be the better usage of inter-professional paradigms.

**Oral Health and Systemic Health:** The need for a Center for Oral Health Promotion from a pure health perspective is best recognized by an understanding of the importance of oral health, particularly as it relates to systemic health. The relationship between the 2 begins with the creation of inflammatory processes that typically result from periodontal disease. Studies have shown that the risk for cardiovascular disease may increase as much as 20% in the presence of periodontal disease, and the risk for stroke appears to be even greater.<sup>3</sup> The inflammatory process may be assisted by the causative bacteria infecting atherosclerotic lesions after they have been developed. This further promotes inflammation and underscores the systemic sequelae of periodontitis.<sup>4</sup>

Diabetes diagnoses are becoming more prevalent in our population.<sup>5</sup> The relationship between periodontitis and diabetes works both ways, namely, periodontitis is a major complication of diabetes and periodontitis increases the risk of poor glycemic control in diabetics.<sup>6</sup> The probable explanation for greater existence of periodontitis in diabetics is that diabetes itself tends to increase the susceptibility to infection and the disease also

impedes the utility of immune cell mechanisms that control infection.<sup>7</sup>

Other prevalent health care issues existent in the U.S. involve pregnancy and subsequent delivery. Specifically, the issues of premature births and low birth weights are highly consequential and have been linked to periodontal diseases. Periodontal disease has not been associated as the only factor producing these outcomes, but has been demonstrated to be highly correlative.<sup>8</sup> This finding is especially important for practitioners in states such as Georgia, because Georgia ranks highest in the U.S. with 9.5% of its births classified as low birth weight. This compares to the national average of 8.2%.<sup>9</sup>

Currently, 75% of adults in the U.S. have undiagnosed periodontal disease.<sup>10</sup> The bacterium found in periodontal disease has been linked to systemic health problems such as osteoporosis, coronary heart disease, low birth-weight babies, diabetes, respiratory disease and kidney disease.<sup>11</sup> The Center for Oral Health Promotion would provide education concerning these risk factors, and further offer nutritional counseling addressing the risk factors associated with obesity and provide tobacco cessation programs.

**Services Offered in the Center for Oral Health Promotion:** In the proposed Center for Oral Health Promotion model, clients would be offered preventive dental care by dental hygiene students and provided instruction on the connection between oral health and systemic health. The dental hygiene students would also conduct risk assessments of patients relative to their systemic health from oral health assessments. The center would be managed and promoted by students in the health care management program. Students from the nursing program would play a key role in health assessments and monitoring of determinants of health status and prescription compliance. Nursing students would provide health literacy education to clients.

The center would provide services to children and adults. As prescribed for an adult or child, services would include oral examination, cancer screening, evaluation of vital signs, dental charting, periodontal screening, sealants, radiographs, dental prophylaxis or scaling and root debridement, fluoride treatment, desensitizing treatment, nutritional counseling and individualized home care instructions. Where appropriate, the dental hygiene students would also counsel in the use of mouth guards to prevent potential sports injuries and bite guards for bruxism.

The center's oral health education program would improve the knowledge of patients by educating them on the standards related to good oral and systemic health. Dental hygiene students would provide oral health literacy education and learn to become an "Oral Health Coach" – someone who would direct and help strategize a plan in collaboration with patients based upon their personal oral health goals and immediate dental health needs. The coach would give individuals and families the background information needed to make informed decisions about their oral health.

A review of the literature revealed no relevant information on oral health coaching. The sources found dealt with coaching as it relates to athletics and traumatic dental lesions and mouth guards and a longitudinal study on smokeless tobacco cessation for collegiate baseball players.<sup>12,13</sup>

Nursing students would learn to become a health coach. A search of "health coaches" resulted in articles on health coaches for lower risk of cardiovascular disease and diabetes and employers providing health coaches for their employees to fuel workplace productivity.<sup>14,15</sup> The functions of the oral health coach and the health coach related to oral health will be further developed in the center.

**Comparison of the Fee Survey Results:** While oral health and preventive care is vital for overall systemic health, access to dental care and oral health literacy is not feasible for an increasing number of Americans. For some, it means living in an area with no physical access to dental health care providers. For many, the access challenge is economic. According to the American Dental Association, a large percentage of Americans lack dental insurance and cannot otherwise afford treatment. While there are federal programs designed to provide dental health care to those in need, they are severely under funded.<sup>16</sup>

The vision for a Center for Oral Health Promotion is to meet the needs of both students in the health care education system and the local community they serve. A goal in support of this vision is to provide needed preventive oral health care to the community, particularly for those who require an economic alternative to the typically higher fees of conventional providers. To assess fees for preventive dental services in support of the proposed center concept, a survey was mailed to 57 dentists in a local county as well as to 2 adjoining counties. The survey listed dental procedures within the scope of dental hygiene practice and requested dentists to provide their fees for these

Table I: Comparison of Survey Fees to Proposed Center Fees

Procedure	Survey Average Fees	Center Fees	Difference	% Difference
Oral Health Screening Exam	\$65.13	\$10.00	\$55.13	85%
Adult Prophylaxis	\$ 94.99	\$35.00	\$59.99	63%
Child Prophylaxis	\$83.84	\$20.00	\$63.84	76%
Adult Full Mouth Radiographs	\$102.54	\$20.00	\$82.54	81%
Child Full Mouth Radiographs	\$106.18	\$12.00	\$94.18	89%
BW's Adult Radiograph	\$54.96	\$10.00	\$44.96	82%
BW's Child Radiograph	\$40.07	\$8.00	\$32.07	80%
Sealants (per tooth)	\$45.22	\$10.00	\$35.22	78%
Single Radiograph (per film)	\$26.04	\$2.00	\$24.04	92%
Panoramic Film (with BW's) adult or child	\$87.65	\$25.00	\$62.65	72%
Teeth Whitening Trays/Education	\$385.17	\$100.00	\$285.17	74%
Refills (whitening)	\$57.25	\$50.00	\$7.25	13%
Antibiotic Therapy (each site)	\$45.60	\$10.00	\$36.50	80%
Non-Surgical Periodontal treatment (includes radiographs)	\$626.01	\$125.00	\$501.01	80%
Non-Surgical Periodontal treatment (without radiographs)	\$739.14	\$105.00	\$634.14	86%

Table II: Comparison of Survey Fees to Proposed Center Fees

Procedure	Survey Average Fees	Center Fees	Difference	% Of Difference
Oral Health Screening Exam	\$65.13	\$10.00	\$55.13	85%
Child Prophylaxis	\$83.84	\$20.00	\$63.84	76%
Panoramic Film (with BW's) adult or child	\$87.65	\$25.00	\$62.65	71%
Sealants 4 teeth	\$180.88	\$40.00	\$140.88	78%
Total	\$417.50	\$95.00	\$322.50	77%

services (Figure 1). To improve the response rate, offices which did not respond were contacted by telephone.

Fifteen dental offices replied, yielding a response rate of 26.32%. Results were tabulated and an average calculated. The averages for each procedure were compared to fees from the proposed center (Table I). While one procedure was within \$7.25 of the survey average, the comparison demonstrates significant differences in fees for 93% of the procedures listed. Variations ranged from \$24.04 to \$634.14, with proposed center fees consistently lower. The fee differences indicate a potential benefit for a segment of the population in need of dental hygiene services who do not have the financial means to afford the higher fees charged outside of the center.

All the services provided at the proposed center are important to oral and systemic health, but per-

haps the most valuable in terms of health vs. economic impact is the oral health screening exam. The exam fee at the proposed center is \$10.00 compared to the area average of \$65.13. This represents an 85% difference, a significant economic benefit. With the incidence of undiagnosed periodontal disease being high, the oral exam visit provides significant health benefits relative to cost. The oral health examination entails a thorough evaluation of the patient's dentition, periodontal status and an oral cancer screening. Of potentially greatest value, patient education is also an integral part of the exam visit. The health benefits for some patients will not only be the diagnosis of existing disease, but possibly more importantly, the education the patient receives about how it is to be treated and prevented in the future. For others, the value will be the education received on how to prevent oral disease and the association of oral health to systemic diseases and conditions. Persons receiving care in the center would need to

accept parameters related to lengthened appointment times, frequency of appointments and the need to travel to the center. Staff scheduling care would need to control for broken appointments.

The initial treatment for periodontitis involves non surgical periodontal therapy. As seen in Table I, this procedure can be quite costly. The average survey cost was \$739.14 as compared to the center's fee of \$105.00. This reflects a savings of \$634.14 for a single treatment. However, the treatment for periodontal disease requires a lifetime maintenance regimen with patients often visiting their health care provider 3 to 4 times a year. This multiplies costs for treatment as well as the potential for savings into the thousands of dollars by those choosing to receive treatment at the center. A parent on a limited income with a child having 4 permanent molars would pay a total of \$95.00 at the center for an exam, radiographs, a prophylaxis and 4 sealants compared to an average total of \$417.50 for those dentists participating in the survey. This represents a potential savings of \$322.50 (Table II).

The proposed center would be funded with a combination of hard and soft monies. The hard sources will be funding typically provided to the existing dental hygiene clinic and the fees which will be collected from clients. Additionally, due to this innovative concept related to patient care, grant funding is anticipated.

### **Operation of the Center for Oral Health Promotion:**

The Department of Dental Hygiene would partner with the Department of Health Care Management and the Nursing Program to ensure the success of the Center for Oral Health Promotion. Students enrolled in these 3 disciplines would be required to take several courses to assure an understanding of interdisciplinary collaboration. Introduction to Health Care Environment and Principles of Inter-professional Education are courses designed to provide an overview of the environment in health care as well as to introduce the basic principles of inter-professional education. An internship course designed to immerse students in the operation of a multi-disciplinary center would be required and essential to the students' understanding of the services provided by the other disciplines.

Dental hygiene students would provide preventive dental care for the Center's clients. One goal of the Center is to have both dental hygiene and nursing students involved in taking comprehensive health histories and developing a care plan controlling for any findings affecting patient care.

Following these shared experiences, dental hygiene students will focus on outcomes of the oral assessment. Identification of periodontal diseases will allow the dental hygiene students to refer patients to nursing students who would use the opportunity to teach and inform the patients of the possible systemic risks and plan for appropriate care. Patients identified at risk for serious health problems associated with their oral health status will be referred to the appropriate community health care provider.

Students from the nursing program would do health assessments, monitor determinants of health status and work with the patients to ensure that they stay compliant with their medication regimens. In some dental settings, particularly educational ones, patients are often denied care because they exceed dental hygiene clinics' hypertensive limits for blood pressure. In questioning the patients, they frequently admit their increase in blood pressure is attributed to not taking either their diuretics and/or antihypertensive medications. Nursing students would work with these patients as soon as they make an appointment to assure compliance with their medications and collaborate with the dental hygiene students on their findings. This will foster the principles of inter-professional education promoted in the center.

Health care management students would be responsible for the day-to-day administrative functions of the center. Primary functions would involve scheduling of patients and staff and maintenance and ordering of supplies. Additionally, these students would work with local schools, churches, service organizations, clubs and senior citizen centers to arrange preventive oral health services. An important role for these students would be marketing to the community. They would be involved in educating the public regarding oral health and systemic health concerns and informing the community of the oral health education classes and programs available at the center. Financially, these students would play an integral role in seeking funds through grants.

The Center for Oral Health Promotion would offer more than preventive oral care services and systemic health education – it would promote collaborative education among health care professionals and create a model that could be adapted at other universities. The concept would teach dental hygiene, health care management and nursing students the importance of inter-professional collaboration in order to achieve goals for optimal health care services. Together, students

would work with the dental, medical and public health community to provide services to improve oral and systemic health care.

The center would exist in an educational setting, allowing it to be staffed by currently employed staff and faculty and enrolled students in dental hygiene, health care management and nursing programs. One new staff position would be required, the director of the Center for Oral Health Promotion. An overview of the proposed center model includes the following:

#### Staff

- Director – Center for Oral Health Promotion
- Center Receptionist
- Junior and Senior Dental Hygiene students
- Dental Hygiene Graduate students
- Senior Health Care Management students
- Health Care Management Graduate students
- Junior and Senior Nursing students
- Nursing Graduate students

#### Clients

- Men
- Women
- Children

#### Marketing Plan

- Information inserts in area church bulletins
- Presentations at area churches i.e. teens and elder church meetings
- Pamphlets at food shelters
- Pamphlets at civic organizations – Masonic Lodge, Lions Club, VFW Lodge
- PSA on local radio stations
- PSA on local cable channels – local news/public access channel
- Local newspaper – health section
- Local K–12 school newspapers/bulletins
- Flyers to K–12 parents
- PTA presentations
- Flyers in area laundromats and supermarkets
- Flyers on car windshields
- City bus posters
- Posters/flyers in area barber shops, beauty salons & restaurants

This proposed center is a concept designed to achieve better health outcomes in the community and to foster the idea of inter-professional education. If marketing plans are successful and the patient pool increases, staffing needs would be adjusted. This type of success could serve as the impetus to increase the size of the dental hygiene

student cohort. Similarly, articulation agreements with other dental hygiene programs in the catchment area could be pursued.

The health care management students who would administer the center would be responsible for scheduling patients and staff, maintenance and ordering of supplies, marketing to the community and be an integral part of seeking funds through grants.

## Discussion

The need for an educational and oral health care delivery paradigm such as a Center for Oral Health Promotion is demonstrated by the previously discussed correlations between oral health and systemic health and by the socio-economic factors in local counties representing the principal catchment area for this concept. While the presence of a Center for Oral Health Promotion would be a useful addition to health care delivery in any community, its existence in the researched county has an even greater sense of urgency. Two separate, but related factors explain this need: the socio-economic status of its residents and the prevalence of systemic diseases with oral disease connections.

Socio-economic factors existent within the research county have produced a situation whereby both children and adults are underserved in their oral health needs. The ratio of dentists per 1,000 population is 0.46 within the study state, but only 0.18 per 1,000 population in the county studied. Similarly, the statewide ratio of licensed dental hygienists is 0.58 per 1,000 population while in county it is 0.25 per 1,000 population.<sup>17</sup>

Data available for children under the age of 19 enrolled in either Medicaid or State Children's Health Insurance Program (SCHIP) reveal that in the county researched only 37.5% receive any dental services. This compares to a statewide total of 40.7%. The research county had only 41 dentists who actively participated in either SCHIP or Medicaid in 2005 serving a population of 286,517.<sup>17</sup>

The problem of access to dental services in the research county is further exacerbated by income levels. County residents had a median household income in 2006 of \$48,076 compared to the statewide median household income of \$56,112. In 2004, the county had 14.8% of its residents living below the poverty level while the statewide figure was 13.7%.<sup>18</sup>

Within the state studied there exists a significant level of morbidity for diabetes, heart disease and

respiratory diseases, all conditions with previously explained oral health connections. The county unfortunately reflects these patterns. Within the county the morbidity rates in 2006 per 100,000 people was 127.9, for heart disease 1, 219.7; and, for respiratory diseases 573.3.<sup>19,20</sup>

Clearly, within the county a need exists for bridging this gap in health care delivery and the proposed Center for Oral Health Promotion will work to address this need.

## Conclusion

The Center for Oral Health Promotion would provide an inter-professional paradigm for dental hygiene, health care management and nursing education. The need for educational experiences for future health care providers in an inter-professional setting is essential to the future of health care in the U.S. As health care moves to centers housing holistic care, providers must have experience in such environments.

The Center for Oral Health Promotion would provide inter-professional educational experiences, oral hygiene care at affordable fees and education to promote oral and systemic health for the public. In this collaborative setting, students will assess

the health status of patients, deliver dental hygiene services and receive health care management experience. Oral health and health literacy educational programs will also be provided to the public. Additionally, the center will help acculturate health care management students to look at and investigate more economic approaches to health care delivery. With the ever increasing cost of health care, a highly valued asset in managers and providers will be the ability to develop strategies to stem this increase. The center would represent a means of accomplishing this as well as influencing students to develop additional models to effect this transition that provide inter-professional practice experiences to future health care providers.

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