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Improving Oral Health in Pakistan Using Dental Hygienists

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Improving Oral Health in Pakistan Using Dental Hygienists

By

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A Review of the Literature Submitted to the Faculty of Old Dominion
University in Partial Fullfillment of the Requirement for the Degree of

MASTER OF SCIENCE IN DENTAL HYGIENE

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November 2008

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ABSTRACT

Improving Oral Health in Pakistan Using Dental Hygienists

Musarrat Anjum Shah
Old Dominion University, 2008
Director: Prof. Deborah B. Bauman

This document presents a review of the literature addressing education, healthcare, healthcare delivery and finance in Pakistan and the oral health status of the Pakistani people. Considering the enormous unmet oral health needs, the insufficient supply of dental professionals and the current unstructured dental hygiene curriculum in Pakistan, this document offers a mission, vision, and goals for the new dental hygiene theoretical framework for Pakistan. Moreover, it offers recommendations for competency-based dental hygiene education and practice, professional licensing, a practice act, and a dental hygiene scope of practice to help protect the welfare of the Pakistani public, i.e., increasing the number of dental hygiene institutions, establishing the dental hygienist as the primary care provider of oral health services, enhancing the current dental hygiene curriculum, and establishing the Dental Hygiene Council with responsibility for educational requirements and regulation of dental hygienists in Pakistan.

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INTRODUCTION

In Pakistan, the burden of oral disease is extensive, preventive oral healthcare services are lacking, and the concept of visiting the dentist on a regular basis does not exist. People visit a dentist when they experience oral pain. Although oral diseases are treatable and preventable, the insufficient supply and distribution of oral health professionals, nonexistence of routine preventive oral health services, and lack of dental equipment contribute to oral health disparity. Pakistani citizens, especially rural residents, have no access to adequate, affordable, and organized oral health services.¹

About 30% of Pakistan's population lives below the poverty line and 55% have access to basic healthcare.¹ It is practically impossible for parents to educate their children because time in school prevents their children from contributing to the family income; therefore, children enter the labor force rather than schools. Factors like these have led to an extremely low literacy rate (56% of adults are illiterate) as well as a lack of knowledge concerning oral health and practice. Approximately, 50% of the children have never used a toothbrush.²

Thus, this paper reviews Pakistan's healthcare delivery and dental care system, oral health status, and the dental care workforce. Considering the enormous unmet oral health needs, the insufficient supply of dental professionals, and the current unstructured dental hygiene curriculum, this document promulgates a vision of the dental hygiene profession for Pakistan, including recommendations of competency-based dental hygiene education and practice, professional licensing, a practice act, and a dental hygiene scope of practice to promote the welfare of the Pakistani public.

OVERVIEW OF PAKISTAN

Situated in South Asia, Pakistan borders Iran, India, Afghanistan, and China (see Figure 1). The nation is composed of four provinces with considerable local authority including Punjab, Sind, Baluchistan and Northwest Frontier Province (NWFP).¹

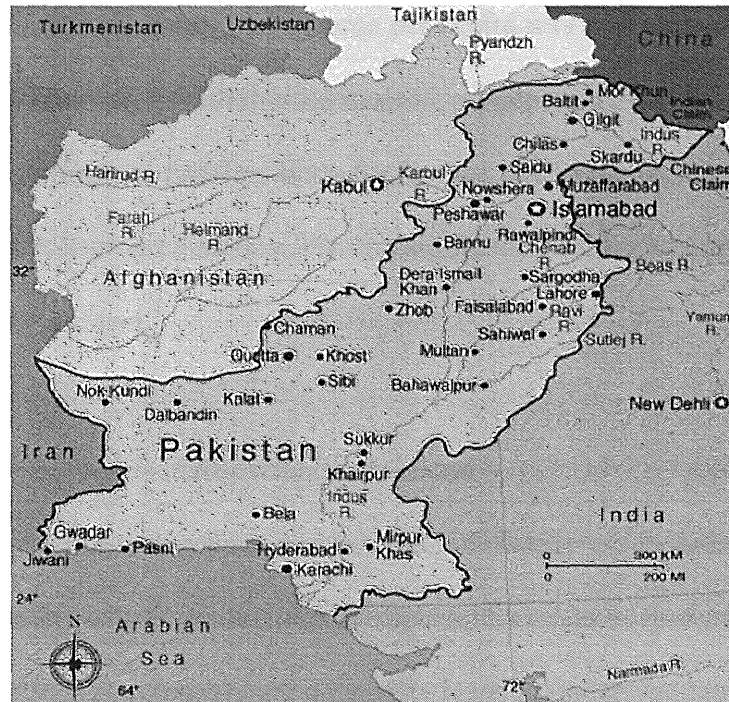


Figure 1. Map of Pakistan

Source: Map of Pakistan. <http://www.desichat.org/images/pakistanmap2.gif>. Accessed July 25, 2008.

Pakistan is the 9th most populous country in the world with a population of about 152 million in 2004.³ According to the 1998 census, 67% of the population lives in rural areas.^{1,3} The life expectancy at birth is approximately 64 years. There are 100 men for every 109 women¹ and the overwhelming majority of the population practices Islam.

Ethnic groups in Pakistan are unified by religion, language, and tribe. The national language is Urdu and English is officially used in the Constitution and by educated urban people. Other languages spoken including Punjabi, Sindhi, Pashto, Balochi, Saraiki, Sindhina, Burushaski, Khowar, Wakhi, and Hindko.³

Agriculture is the large sector of the country's economy and a significant share of national gross domestic product.³ Almost 30% of the Pakistan population lives below the poverty line.¹ In 2003, the gross national income per capita was \$430 U.S. (approximately 30,100 rupees).³ With limited income, people rarely meet their basic needs for survival. Low-income families settle for low quality living conditions, invest little on health and even less on education. Poverty limits the country's potential as well as its current ability to perform.⁴

Education in Pakistan

The Pakistan educational system is organized into five levels including primary, middle, high (culminating in 10th grade), intermediate (eleven and twelve which leads to diploma in arts or diploma in science), and university leads to undergraduate and graduate degrees. Relatively limited sources have been allocated to education in Pakistan, i.e., less than 2% of the gross domestic product is spent on education. Pakistan has proved reluctant to invest in education. Mahmood, Sheikh, and Mahmood⁵ found a positive correlation between poverty and lack of education, i.e., the more educated the head of the household, the less likely the household will be indigent.⁵

Significant educational disparity exists between males and females due to the male dominated society. In 2003, nearly 46% of those aged 15 years or older were literate

(59.8% males and 30.6% females).³ According to the *Ministry for Women's Development*⁶, reluctance to enroll females in schools is due to the concern for their safety and honor⁶ as well as cultural and religious beliefs. Bhalotra⁷ found that Pakistani parents with relatively high incomes, avail their boys an education and overlook girls.⁷ According to *Situation Analysis of Women in Pakistan*⁸, men and women reside in two separate worlds. The father or elder brother is the head of the family and decision maker. Home is the woman's legitimate ideological and physical space, while men dominate the world outside the home. The notion of male honor and female *izzat* (purity and modesty) is linked with women's sexual behavior, which is a potential threat to the honor of the family. Therefore, women are restricted and controlled through *purdah* (women are to be completely covered up, in and outside of the house) and sex segregation. Pakistani women lack social value and status because their roles as producers and providers have been denied. The preference for sons over daughters due to the males' productive role dictates the distribution of household resources in favor of them. This is why parents bestow the best education possible upon their sons and ensure that they are well-equipped with skills that can help them compete for resources in the public arena; in contrast, daughters are taught domestic skills to be good mothers and wives. However, the nature and degree of females' oppression and subordination may depend on class, geographic region, and the rural/urban living conditions.⁸ The literacy rate and school enrollment is higher in urban areas compared to rural areas. The Pakistani government plans to increase the literacy rate to 78% by 2011, and more than 50% of the funds for this increase is expected to come from international donors.³ It is obvious that the government of Pakistan needs to acknowledge the national education expenditures and take steps

forward to enhance the literacy rate of the population. Improved literacy will support the healthcare system, promote the overall health of the population and provide the foundation for a reliable workforce.

Healthcare in Pakistan

Healthcare Delivery in Pakistan

The healthcare system in Pakistan offers unequal services throughout the nation. “The poor, rural population, the less educated, women and children such as in Baluchistan are especially vulnerable and ignored by the healthcare system.”⁴ Pakistan’s health infrastructure is underdeveloped especially in rural areas; yet, 70% of the population lives there. According to the *All Pakistan Women’s Association* (PPSEAWA Pakistan),⁹ 25 children in 100 die before their first year. Moreover, 37%¹⁰ of newborns are underweight and 40% are born malnourished signifying maternal malnourishment. Furthermore, more than 50% of children under five are chronically malnourished.⁹ Maternal mortality rate is high; one woman in every 38 dies from pregnancy-related causes.⁸ A significant gap between the health status of males and females has also been noted. On average, 12% more girls under four years of age die as compared to boys. These deaths are often due to communicable diseases (tuberculosis, diarrhea, pneumonia, tetanus) which can easily be prevented.¹¹ Factors contributing to the population’s poor health include inadequate health expenditures, low per capita income, cultural and gender differences, and the lack of awareness of overall health due to illiteracy.

Despite the low healthcare expenditure, gender insensitivity, and inadequate supply of health professionals, the Pakistani government has recognized the public health problems and has made notable progress in expanding healthcare. For instance, the government has increased the health professionals to population ratios and different levels of preventive healthcare services have been initiated.¹² The government has employed approximately 70,000 lady health workers (LHW), trained in basic medicines, preventive care, and maternal and child health. These community-based LHWs provide primary health care services to women and children to help reduce child mortality, malnourishment, and enhance child safety.^{1,13} LHW services have improved the health status of the poor by providing health education, contraceptives, iron supplementation, immunization, and pre-natal care.¹⁴

Federally funded programs also have been initiated to help minimize and eradicate communicable diseases, expand immunization, and provide food and nutrition to the public.^{1,13} To enhance the distribution of future health delivery systems, the government has developed and established a national Health Management Information System (HMIS)¹⁵ which collects, processes, analyzes and interprets health-related data (i.e., information on drugs, program finance, equipment, and so forth) essential to effective health delivery. This information system is beneficial in planning, conducting, and assessing specific healthcare programs. Besides the main HMIS for the “first level care facility”, the Lady Health Workers Management Information System supports the National Program for Family Planning and Primary Health Care.¹⁵

Public Healthcare Sector. The Pakistan Medical and Dental Council regulates medical and dental care, while the Federal Ministry of Health directs national planning and coordinating in the field of health. The provincial departments of health implement health policies and provide healthcare through government hospitals and other healthcare facilities. However, healthcare delivery in the public health context is the responsibility of the district governments. Conversely, the private and nongovernmental institutions, which make up 70% of the healthcare sector, manage their own budgets. Public healthcare providers are paid a fixed salary by the government; however, their private practice income after working hours is unknown. The public healthcare sector provides preventive and therapeutic services. The public therapeutic care constitutes three levels: primary, secondary, and tertiary (see Figure 2).

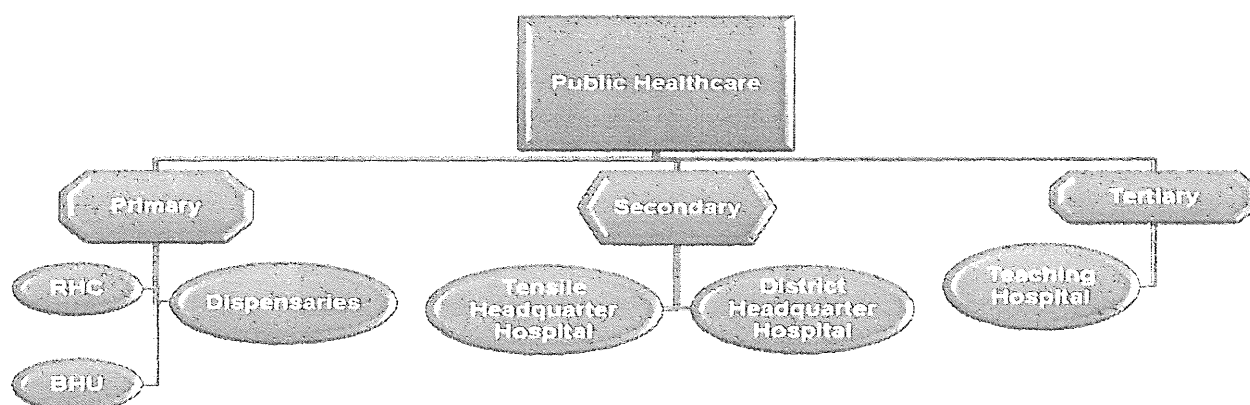


Figure 2: Public Healthcare Sector

Primary healthcare services are provided through rural health centers (RHC), dispensaries and basic health units (BHU) (see Figure 3). The dispensaries provide outpatient care,

while the BHUs offer both inpatient and outpatient services.^{14,16} The RHCs, staffed with two to three medical officers, nurses, dispensers, dental technicians, and vaccinators, provide basic diagnostic and preventive services.¹⁴ The distribution of these facilities is population based; for every 5,000 to 10,000 people, there is one BHU and a RHC for a population of 40,000 to 100,000 people.¹

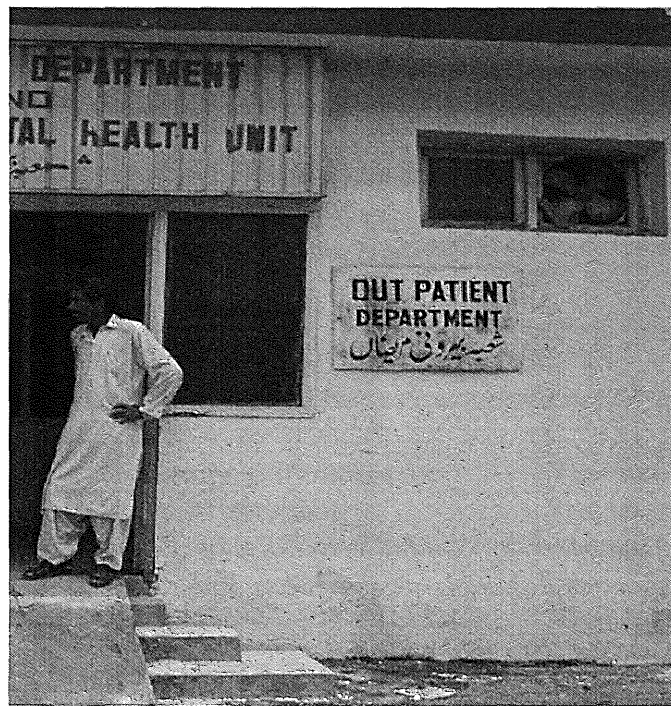


Figure 3: Public Health Facility in Pakistan

Source: Nishtar S. The Gateway Paper II-Health Systems in Pakistan: A Way Forward. Islamabad, Pakistan: Heartfile and Health Policy Forum; 2006. <http://www.heartfile.org/pdf/5-OPI-B-HF.pdf>. Accessed Oct.7, 2008.

According to Mahbub ul Haq,⁴ the people of Pakistan are very dissatisfied with their current healthcare system.⁴ Most public health centers operate only a few hours daily or

have been closed. The BHUs lack basic amenities, i.e., 28% have no electricity; the examination tables, weighing scales, and instruments including blood pressure are decrepit and 21% lack female health professionals.¹⁴ This lack of female health professionals might be due to the low (30%) female literacy rate and attitude toward the role of women outside the home. Thus, public attendance at the primary healthcare sector is low.¹⁴

In the secondary public healthcare sector, therapeutic care is provided through the tehsil headquarters hospitals and the district headquarters hospitals. These hospitals house specialists who treat major medical problems. Conversely, at the tertiary level, public healthcare is delivered through teaching hospitals located in major cities (see Table 1).^{14,16}

Table 1. Public Healthcare System in Pakistan

Primary Healthcare	Secondary Healthcare	Tertiary Healthcare
Rural Health Centers (RHC)- provide basic diagnostic and preventive services	Tehsil Headquarters Hospitals- cover the population at sub district level	Teaching hospitals located in major cities- provide major and minor medical services
Dispensaries- provide outpatient care	District Headquarters Hospitals- serve a district	Consists of surgical departments which provide 24-hours emergency service
Basic Health Units (BHU)- provide inpatient and outpatient services	Both consist of specialists and treat major medical problems	

Public preventive care services are presented through “vertical programs” which provide governmental funded services and programs such as maternal and child health,

tuberculosis control, National AIDS Control, Expanded Immunization, Malaria Control, and the Women's Health Project.^{14, 16}

Healthcare in Pakistan is minimal. Hospitals have seven beds for every 10,000 people.¹ As a result, hospitals are overburdened with patients. Public health facilities are remote, underfunded, understaffed and require out-of-pocket payments for supposedly free services. More than 40% of the patients in secondary and tertiary care have problems that can be met at a primary level (at the BHUs or RHCs) (see Figure 4). Thus, attendance at public health facilities is low and consumers prefer the private healthcare sector.^{14, 16}

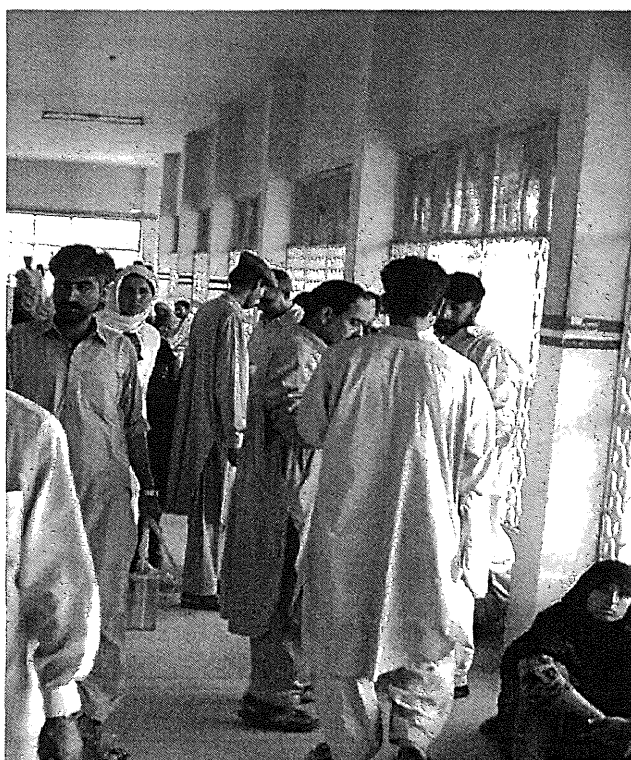


Figure 4: A Pakistan Hospital Overburdened with People

Source: Nishtar S. The Gateway Paper II-Health Systems in Pakistan: A Way Forward. Islamabad, Pakistan: Heartfile and Health Policy Forum; 2006. <http://www.heartfile.org/pdf/2-BoD.pdf>. Accessed Oct. 7, 2008.

Private Healthcare Sector. Distinguishing between the public and private healthcare sectors is difficult because many public sector professionals also practice privately. The private health sector includes both for-profit providers, non-profit non-governmental organization (NGO), and informal sector. The stand alone, for-profit private health sector includes doctors, nurses, pharmacists, traditional healers, drug vendors, laboratory technicians, shopkeepers and unqualified practitioners, and is the major providers of outpatient care. Private health services and medications are delivered through hospitals, nursing homes, maternity clinics; clinics owned by doctors, nurses, midwives; diagnostic facilities; pharmacists; and unqualified sellers. Nishtar¹⁴ concluded that the owners of private clinics have no ethical values, charge unaffordable fees, provide unsanitary environment, and offer outdated medical technology.¹⁴ With no quality assurance mechanisms, the private sector is known for over prescribing medications and over-use of diagnostics services.¹⁴ For example, prescribing antibiotics for the common cold and without any diagnostics tests is very common.

The NGO private health sector includes more than 80,000 organizations, e.g., Edhi, Marie Stopes, Aid to Leprosy Patients, Sight Savers, Save the Children, Sahil, Green Star, Heartfile and many others. Most NGOs are in urban areas and target people with HIV/AIDS, abused victims, non-camp based refugees, the poor and inaccessible individuals.¹⁴ The NGO private sector has many advantages when compared to the public health sector such as technical expertise in specific program-related areas, flexibility to introduce innovations, and outreach advantage as in the case of non-facility health program approaches, community distribution channels and mobile health units.¹⁴

As of 2003 there were 91,392 registered doctors, 40,114 nurses, and 5,845 lady health workers in Pakistan.¹ The doctor to patient ratio needs to be increased; however, with an average income of less than 3000 rupees (approximately \$43) per month and medical college education costing approximately two million rupees, few people can afford medical schools.¹⁷ According to Talati and Pappas,¹⁸ emigration of healthcare professionals to other developed countries is another critical factor contributing to the shortage.¹⁸

Healthcare Finance in Pakistan

The total health expenditure of Pakistan is approximately 0.7%¹ of the country's gross domestic product (GDP), which is disproportionately low when compared to 16% in the United States.¹⁹ Forty-three percent of the GDP is spent on the country's debt rather than quality primary care.¹⁶ Oral health services are not delivered separately from overall healthcare; therefore, no records of annual oral healthcare expenditures is available.¹ According to Nishtar,¹⁴ the current modes of financing healthcare in Pakistan include (in order of prevalence) patient out-of-pocket payments, tax-based revenues, donations (4-16%), employee's social security plans (3.06%), safety nets (0.3-3% such as Zakat, religious charity), community co-financing and grants.¹⁴

Employees' Social Security Scheme is the only comprehensive health coverage system in Pakistan; however, it generates funds for federal government employees, who make up approximately 3.06% of the labor workforce in Pakistan. This system excludes the large agricultural workforce. In this system, federal government employees contribute monthly from their salaries thus, are eligible for healthcare through a network of hospitals

and dispensaries. All private companies with more than ten employees are also required to contribute to the Social Security Scheme. Other social security funds assist in medical cost such as Zakat, Bait-ul-Mal, Workers Welfare Fund, Employees Old Age Benefit, Guzara Programme and Workers Participation Fund. However, these funds have their own disbursement mechanisms.¹⁴

Private health insurance in Pakistan has yet to evolve. Pakistan has a small number of private health insurance companies located in the urban areas where the cost of healthcare services are high. These insurance companies operate through private healthcare systems, providing coverage only to employees of private companies. Private health insurance is not available to the majority rural population because insurance companies are located only in large cities.¹⁴

Dental Care Delivery and Finance in Pakistan

Despite the fact that Pakistan has no oral healthcare budget, the Director of General Health Services has created oral health facilities in remote areas of Punjab, Sind, and Balochistan provinces; most of the posts are yet to be filled with oral health professionals. Oral health services in the public sector are delivered through the Rural Health Centers (RHC). Although there are 541 RHCs for the 105 million rural inhabitants, 341 posts are vacant, leaving one dentist for 0.5 million people. Furthermore, 40% of the dental equipment at RHCs is nonfunctional and dental materials, instruments and drugs are excluded from the RHCs' essential supply list. The public oral health facilities are clearly unable to meet the dental health need of the people especially the underprivileged. Thus, rudimentary oral health services in rural areas are provided by

“the village blacksmith or shopkeeper” whose extractions are usually administered without infection control or local anesthesia.¹

Oral Health Status in Pakistan

Oral health care is a far greater need than general healthcare, yet it is a very low priority for the majority of Pakistan people. In 1996, only 6% of children brushed their teeth on a daily basis; nearly 50% have never used a toothbrush and the 44% who do only brush their teeth once a week or less.² Tanwir, Altamash, and Gustafsson²⁰ revealed that 54% of adults in Karachi perceived personal oral problems. Thirty-three percent of the adults are dissatisfied with their dental aesthetics, 17% had oral pain, 15% had cavities and 8% reported difficulty chewing. These researchers also reported an association between increased age with increased pain, gingivitis, and periodontitis. Furthermore, females and people who were illiterate reported more oral problems than males.²⁰ Tanwir et al²⁰ concluded that oral pain and untreated disease are extensive in Karachi residents.²⁰

The lack of oral health awareness (even among medical professionals) accounts for over 90% of all untreated oral diseases including caries and periodontal disease. The concept of visiting the dentists on a regular basis does not exist. Pakistan people visit a dentist when they experience oral pain. Oral health knowledge deficit and absence of toothache are responsible for delays in seeking dental treatment; consequently, individuals who present for dental treatment are usually beyond restorative care, necessitating tooth extraction. It is not surprising that 90% of all the treatment provided in the public dental clinics is tooth extraction. Oral examination, scaling and prophylaxis count for less than 3% of the services provided in public dental clinics.¹ Children grow

uninformed of the importance of oral care and consequently become adults with compromised oral health, missing teeth and oral dysfunction.²¹ Geographic location, gender and economic status play a role in who receives dental care; urban people, males, and those with high socioeconomic status seek dental care more often in comparison with rural residents, those with low socioeconomic status, and females.¹

Oral Diseases and Disorders

Dental Caries. The prevalence of dental caries in Pakistan is significantly less than the prevalence of gingivitis, periodontitis, and oral cancer. Fifty percent of Pakistan children, 12-15 years of age, present with carious lesions. However, the prevalence of caries is on the rise in Pakistan when comparing the DMFT score of 12-15 year olds with previous findings. For example, the DMFT index of 12 year-olds was reported as 1.2 in 1988 and 1.6 in 2003. Similarly, the DMFT score of 15-18 year-olds was 1.8 in 1988 and has increased to 2.3 in 2003.^{1,22} On the other hand, 97% of Pakistani children, age 12-15 with carious lesions, are untreated.¹ Untreated carious lesions have decreased slightly from 98.5% in 1992.²³ In contrast to Pakistan, 59% of US adolescents age 12-19 year-olds have caries and only 23% present with unmet oral needs.²⁴

Pakistani adults have unmet oral needs as well. Half of the caries present in Pakistani adults age 35-44 have not been restored while more than 90% of the treatment provided is tooth extraction. A similar percentage of extracted teeth in adults age 65 and over are observed. Due to the poor diet of adults age 65 and over, a high prevalence of caries has been reported. A positive correlation between age and caries in Pakistan is also evident, as age increases, the prevalence of caries increases as well. On average, seniors

age 65 and older have 18 teeth affected by caries. The prevalence of caries in rural areas is more pronounced than in urban areas. The increased sugar consumption is responsible for the increased incidence of caries in children and adults.¹

Periodontal Disease. Less than 28% of 12-year-old children have healthy gingiva. Twenty-two percent of women have bleeding gingiva and 34% have dental calculus.¹ As many as 17% of 18-34 year-old women have advanced periodontal disease (attachment loss of more than 6mm).^{1,25} Furthermore, 93% of 65 year olds have some form of gingivitis or periodontitis.¹ For comparison, in the United States, 5.08% of adults age 20-64 and 11.88% of 50-64 year olds have moderate or severe periodontal disease.²⁴ Like caries, the prevalence of gingivitis and periodontitis is more pronounced in rural areas. The *Situation Analysis Oral Health in Pakistan*¹ further indicates that one third of the national population could greatly benefit from scaling or nonsurgical periodontal therapy¹ (see Figure 5). According to Qureshi, Ijaz, Syed, Qureshi, and Khan,²⁵ pre-term delivery of low birth-weight babies in Pakistan occurs in 37% of all live births, which the authors correlate with the high prevalence of periodontal disease in women of childbearing age (18-34 years).²⁵

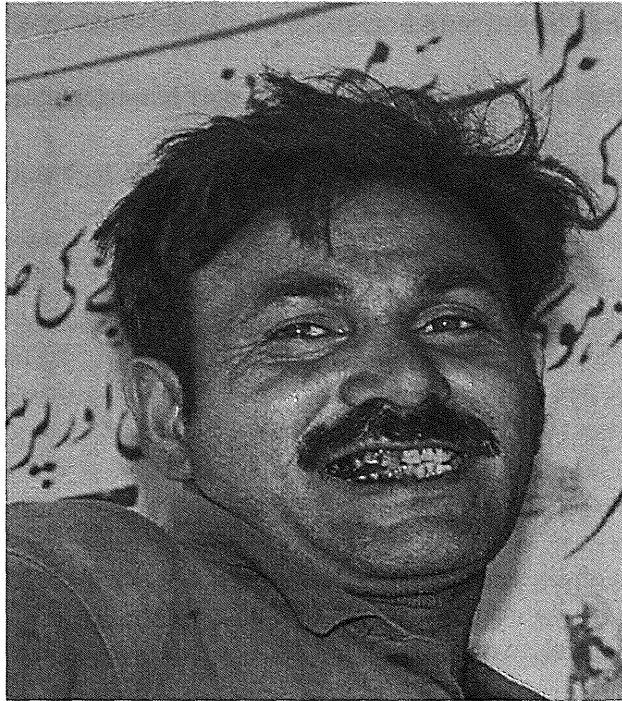


Figure 5: A Pakistani Man Exhibiting Dental Stains and Periodontal Disease

Source: Nishtar S. The Gateway Paper II-Health Systems in Pakistan: A Way Forward. Islamabad, Pakistan: Heartfile and Health Policy Forum; 2006. <http://www.heartfile.org/pdf/4-HO-G-DP.pdf>

Oral Cancer. Oral cancer, a relatively rare cancer globally, is highly prevalent in Pakistan. Oral cancer is the second most common cancer in Pakistani males (following lung cancer) and females (following breast cancer). The incidence and the risk factors for oral cancer are similar in both genders. The major risk factor for oral cancer is chewing betel-quid (extract of the *Acacia catechu* tree), areca nut (the seed of the areca nut palm) in combination with tobacco use. A relationship between duration of chewing, frequency of chewing per day, and retention of chewing betel-quid overnight while asleep was found.¹ Approximately 34% of men and 12.5% of women use some form of tobacco on a regular basis.¹ This finding was confirmed by Bhurgri, Bhurgri, Hussainy, Usman, Faridi,

Malik, et al²⁶ who investigated the demographics of oral pharyngeal cancer in south Karachi as documented in the Karachi Cancer Registry during 1995-2001. Findings indicated a significant number of advanced stage cancer cases and most of the lesions had metastasized to distant sites at time of diagnosis. Squamous cell carcinoma comprised 96.5% of the total cancer lesions. Laryngeal cancer was three times more frequent in males in comparison to females.²⁶

Other Oral Conditions. Due to the oral health knowledge deficit, cost and low dentists to population ratios, only 5% of the 35-44 year old edentulous individuals' wear oral prosthesis while another 30% greatly need them. More than 60% of the seniors (65 year old and over) require oral prosthesis but only 17% wear either partial or complete dentures.¹

The temporo-mandibular joint (TMJ) and its associated structures play a significant role in the normal function of the masticatory system. Dysfunction in the TMJ can appear as pain, clicking, mandibular deviation or limited jaw opening, which can greatly affect a person's quality of life. According to the *Oral Health in Pakistan a Situation Analysis*¹, 12% of the 15 and 35 year olds and 21% of 65 year olds have TMJ clicking disorder. Moreover, 12% of the 65 year olds have joint tenderness problems.¹

Fluoride in Pakistan

Community water fluoridation is inexpensive, effective, and equitable.²⁷ Although, water fluoridation significantly inhibits caries, its is not available in most parts of Pakistan. Khan, Helen, and O'Mullane²⁸ assessed the natural fluoride levels in water supplies in Pakistan. After analyzing 987 water samples from piped water, tube-wells,

wells in rural areas and various streams, they found that the 84% of the water contained less than 0.7 ppm of fluoride. The authors concluded that there is a great need for alternative sources of fluoride in Pakistan.²⁸ Khan²⁹ also found that Pakistan is a low fluoride country when he analyzed 991 water samples from all four provinces of Pakistan. About 64% of the locations had fluoride level below 0.3 ppm, while only 6% of the locations were in the optimum range of 0.7 ppm to 1.0 ppm. In addition, 1% of the locations were found to have fluoride in the range of 2 ppm to 3 ppm and 1.5% had fluoride level higher than 3.0 ppm, levels likely to cause fluorosis.²⁹ According to *Oral Health in Pakistan a Situation Analysis*¹, the fluoride levels in drinking water vary throughout the country.¹ Siddique, Mumtaz, Saied, Karim and Zaigham³⁰ collected water samples in Karachi, Pakistan, confirm the variation of fluoride levels in the country. Siddique et al³⁰ found that the fluoride contents in water samples collected from the subsurface and river sources were below the recommended fluoride value (less than 0.7ppm); however, the groundwater samples in some industrial areas revealed higher level (more than 1.2ppm) of fluoride concentration.³⁰ Based on the evidence, the citizens of Pakistan lack optimum level of fluoride in their water supply.

Given the great health needs of the nation, the Pakistan Dental Association³¹ initiated a project to improve oral healthcare of schoolchildren in one pilot tehsil of the country. The project includes two weeks of screening followed by treatments, i.e., fillings, extractions, scaling, and root canal treatment by a dentist and a dental assistant (no dental hygienist) with fully functional portable dental unit, instruments and materials. The goal of the project is to enhance oral care awareness, improve the oral health

behaviors, and the oral health status of approximately 800 schoolchildren by providing oral health services at schools.³¹

Dental Care Workforce in Pakistan

Dentistry

There are 16 dental colleges in Pakistan, mostly private, graduating more than 600 dentists per year.¹ Eligibility criteria for attending dental school includes the successful completion of intermediate level (grade 11 and 12) education after matriculation and an entrance test consisting of 100 questions covering biology, chemistry, physics, and English. The Provincial Government for Dental Colleges designs the entrance test and both private and public dental schools use the test. The four-year dental school curriculum leads to Bachelor of Dental Surgery (BDS) (see Table 2).³²⁻³⁴

In Dow University of Health Sciences, the tuition expenses for two semesters of BDS education cost 60,000 rupees (approximately 900.00 US dollars).³² Despite the number of dental graduates in the country, the proportion of dentists to the population remains low.³⁵ As of 2008, there were 8,169 dental surgeons' registered with Pakistan Medical and Dental Council (PMDC).³⁶ According to *The Economic Survey of Pakistan* 2002-2003, there is one dentist for 29,405 people. The number of dental specialists in Pakistan is insufficient as well. Only 6% of the dentists have postgraduate dental education, leaving the dental institutions with inadequate teaching faculty and inadequate numbers of oral surgeons for the public.^{1, 35} Controversy exists among governmental and private dental institutions whether or not to recognize the private dental schools due to their lack of adequate teaching staff.¹ According to Soofi³⁵ both the public and private

dental institutions lack qualified instructors. In 2003, there were five candidates pursuing PhDs; however, there was only one qualified professor to guide them.³⁵

Table 2. Bachelor of Dental Surgery in Pakistan
List of Major Core Courses

	First-year	Second-year	Third-year	Final year
Lectures, Laboratory and clinic	Anatomy, Neuro-anatomy, Histology, and Embryology (400 hours) Physiology (200 hours) Biochemistry (200 hours) Dental Materials (200 hours)	General and Dental Pharmacology and Therapeutics (160 hours) General Pathology and Microbiology, Bacteriology (200 hours) Oral anatomy, Physiology, Histology & Tooth Morphology (145 hours) Community Health dentistry (not specified)	General Medicine (260 hours) General Surgery (260 hours) Oral Pathology, Histology & Microbiology (165 hours) Oral Diagnosis, Oral Medicine & Periodontology (265 hours)	Oral & Maxillofacial Surgery, Anesthesia, & Exodontia (330 hours) Orthodontics (180 hours) and Oral Radiology (35 hours) Operative Dentistry including Paedodontics & Endodontic (135 hours) Prosthodontics (250 hours)

Source: Dow University of Health Sciences. <http://www.duhs.edu.pk/index.php?page=diiohs&details=curriculum-of-bds>. Accessed June 16, 2008.

Health Department Government of Sindh. <http://www.sindhhealth.gov.pk/rulesofadmission.htm>. Accessed June 30, 2008.

Pakistan Medical and Dental Council; the statutory regulatory and registration authority for medical and dental education and practitioners for Pakistan. Pakistan Medical and Dental Council. <http://www.pmdc.org.pk/stat.htm>. Accessed July 29, 2008.

The PMDC³⁶ establishes minimum standards for education, licensure and relicensure for medicine and dentistry, and sets standards for the instructors in the medical/dental colleges in Pakistan. Every five years, the PMDC inspects the medical/dental colleges in the country to ensure the institutions are following the Council regulations, criteria and Code of Medical Ethics. The PMDC designs medical and dental National Board Examination and sanctions those who practice below the accepted standards of the medical and dental profession. The PMDC system of accreditation has been reviewed by the National Committee on Foreign Medical Education and the U.S. Department of Education and found to be comparable to the evaluation systems of the United States, Canada, and United Kingdom.³⁶

The first two years of BDS are devoted to the pre-clinical subjects; the clinical component begins in the third year of BDS. At the completion of each year is a comprehensive examination.³²⁻³⁴ A minimum of one-year training residency is mandatory for all dental graduates with rotational duties in oral surgery, prosthetic, orthodontic and restorative dentistry. The dental institutions are responsible for arranging residencies for dental graduates.³⁶ Upon successful completion of the four-year curriculum, the BDS students take the National Board Examination.³²⁻³⁴ Subsequent to the successful completion of the National Board Examination, dentists are required to register with the

PMDC. The BDS scope of practice includes diagnosis, examination, scaling, root debridement, restorations, extractions, and root canal treatments.³⁶

Dental Hygiene

Dentists are the only licensed oral healthcare providers in Pakistan. Pakistani dentists are reluctant to use “middle-level personnel,” i.e., dental hygienists. According to the *Oral Health in Pakistan A Situation Analysis*,¹

“the reason for the objection [of dental hygienists] in Pakistan is that in previous attempts the operating auxiliary providers [dental technicians] have consistently taken advantage of the inadequate supply and mal-distribution of dental surgeons to perform procedures not within their job description.”¹

Currently, two dental hygiene diploma programs are offered in Pakistan, each graduating approximately 15-20 dental hygienists per year with the Diploma of Dental Hygiene (DDH).¹ The dental hygiene curriculum takes approximately two years to complete (four-semester lasting 18 weeks each), following two years of intermediate level education (4 years total) (see Table 3 and 4). Eligibility criteria for the dental hygiene programs include successful completion of the intermediate sciences (diploma in science offered in grade 11th and 12th) and at least 50% score on the entrance test (the same entrance test as BDS).³⁷

Table 3. Diploma of Dental Hygiene in Pakistan**List of Major Core Courses³⁷**

	First-Semester	Second-Semester	Third and Fourth-Semester
Lectures, Laboratory and Clinic	Basic Computer Skills English proficiency Behavioral Sciences Research Methodology Anatomy Physiology Microbiology Biochemistry Pathology Pharmacology	Dental Pharmacology Oral Anatomy & Tooth Morphology Dental Materials Community Dentistry Sterilization & Disinfection	Periodontology Operative Dentistry Prosthodontics Orthodontics Clinical Practice in Dental Hospitals

Table 4. Comparison of US Accredited Associate Degree Dental Hygiene Program Requirements with Pakistan Diploma Program

List of Courses	Pakistan Diploma Program in Dental Hygiene	Associate of Science in Dental Hygiene- Georgia Perimeter College	# Credit Hours for Associate Degree
English	Yes	Yes	3
Basic Computer Skills	Yes	N/A	1
Research Methodology	Yes	N/A	N/A
Behavioral Sciences	Yes	N/A	N/A
Speech	N/A	Yes	3
Sterilization and Disinfection	Yes	N/A	N/A
Psychology	N/A	Yes	3
Sociology	N/A	Yes	3
General Chemistry w/lab	Yes	Yes	7 or 8
Anatomy and Physiology w/ lab	Yes	Yes	8
Biochemistry	Yes	N/A	N/A
Microbiology	Yes	Yes	4
History	N/A	Yes	3
US Political Science	N/A	Yes	3
Dental Hygiene I/ Clinical Practice in Dental Hygiene	3 rd and 4 th semester	Yes	3
Operative Dentistry	3 rd and 4 th semester	N/A	N/A
Periodontology	Yes	Yes	3
Orthodontics	Yes	N/A	N/A
Prosthodontics	Yes	N/A	N/A
Clinical Dental Hygiene		Yes	2
Dental Tissues/ Head and Neck Anatomy	Yes	Yes	4
Dental Radiology	N/A	Yes	2
Dental Hygiene II	N/A	Yes	2
Clinical Dental Hygiene II	N/A	Yes	3
Oral Pathology	Yes	Yes	4
Dental Hygiene III	N/A	Yes	1
Clinical Dental Hygiene III	N/A	Yes	2
Dental Materials	Yes	Yes	1
Dental Hygiene IV	N/A	Yes	2
Clinical Dental Hygiene IV	N/A	Yes	3
Public Health/ Community	Yes	Yes	3
Pharmacology and Anesthesiology	Yes	Yes	2
Dental Hygiene V	N/A	Yes	1
Clinical Dental Hygiene V	N/A	Yes	4

Source: Georgia Perimeter College Associate of Science in Dental Hygiene. 2006-2008 Curriculum and Programs of Study. <http://www.gpc.edu/~acadaff/cat/programs/DentalHygiene.html>. Accessed September 7, 2008.

Dow University of Health Sciences School of Dental Care Professionals (DCP). Dr. Ishrat-ul-ebad khan Institute of oral health sciences (DIIOHS). Prospectus for Admission in Session 2007-2008. <http://www.duhs.edu.pk/download/prospectus/prospectusDCP-2007-08.pdf>. Accessed July 1, 2008.

Based on 2008 fees, the first year of dental hygiene tuition in Dow University of Health Sciences costs 12,000.00 rupees (approximately \$171) and 10,000 (\$142.00) for each subsequent semesters.³⁷ There is no legally defined scope of practice or job opportunities for dental hygienists in the public or private sectors.¹ Furthermore, the dental hygiene programs lack formal accreditation and standardized curriculum. Thus far, no record of a dental hygienists' association, minimal educational standards or a model for dental hygiene education exists in Pakistan.

Dental Technology

Dental technicians are non-clinical operating personnel whose scope of practice includes fabricating oral prostheses under the direction of the dentist. There are four dental laboratory technician programs in Pakistan. The eligibility criteria and curriculum for dental technicians are equivalent to that of diploma of dental hygiene except for the third and fourth semester courses (see Table 5).³⁷ Since tertiary healthcare is not offered in public oral health facilities, employment as a dental technicians is limited to private dental practices. Dental technicians are often mistaken for dentists because many dental technicians have opened their own clinics, performing procedures beyond their scope of

practice and training.¹ When dental technicians are referred to as “doctors”, they do not correct the misconception. According to *Oral Health in Pakistan a Situation Analysis*,¹ an estimated 40,000 non-qualified dental practitioners are practicing dentistry in underserved populations in remote locations.¹

Table 5. Diploma of Dental Technology in Pakistan

List of Major Core Courses³⁷

	First-Semester	Second-Semester	Third and Fourth-Semester
Lectures, Laboratory and Clinic	Basic Computer Skills English Proficiency Behavioral Sciences Research Methodology Anatomy Physiology Microbiology Biochemistry Pathology Pharmacology	Dental Pharmacology Oral Anatomy and Tooth Morphology Dental Materials Community Dentistry Sterilization and Disinfection	Dental Laboratory Equipment Dental Laboratory Materials Casting and Curing Techniques Principle of Removable and Functional Orthodontic Appliance Dental Porcelain and its Handling Practical Work in Laboratory

A PLAN FOR DENTAL HYGIENE IN PAKISTAN

Definition and Mission

Dental hygiene focuses on the management of behaviors necessary to promote oral health and prevent oral diseases. The central concepts in dental hygiene include the client, environment, health/oral health, dental hygiene actions, their relationship and the factors that affect them. A dental hygienist practices as a clinician and oral health educator in collaboration with other health professionals. A dental hygienist uses preventive and therapeutic methods to promote oral health and prevent as well as control oral diseases.²⁷

The mission of the dental hygiene profession is to promote a high standard of dental hygiene practice. The profession is dedicated to improving the public's overall health by ensuring that dental hygienists are properly educated to provide the best quality oral healthcare within their scope of practice, and that the public, including the most vulnerable, indigent, and rural, have access to primary oral health care; and hence an improved quality of life.³⁸

Dental Hygiene Goals³⁸

Dental hygienists aspire to improve society's oral and systemic health by:

1. Increasing access to quality oral healthcare for all Pakistani residents.
2. Creating collaborative professional relationships with other healthcare providers.
3. Utilizing evidence-based decision making to solve oral problems.

4. Providing preventive, educational and therapeutic oral health services in various healthcare settings to control oral diseases.
5. Practicing dental hygiene ethically, safely, and legally.
6. Increasing public awareness of oral disease, its prevention, treatment, and relationship to systemic disease.
7. Enhancing dental hygiene practice through continuous quality improvement measures.

Dental Hygiene Vision

The dental hygiene profession's vision is to attract competent members who can collaborate with other health professionals to improve general and oral health and quality of life for all. Given this vision, the profession foresees the development of strong academic programs for dental hygienists, effective rules and regulations that govern practice, and mechanisms to ensure quality practice over the dental hygienist's lifetime.³⁸

Roles of the Dental Hygienist

To successfully utilize dental hygienists and improve the oral health of Pakistan's citizens, the roles and competencies of the dental hygienist must be clarified and implemented. Properly educated and employed, dental hygienists assume several important roles- clinician, educator, administrator, consumer advocate, and researcher (see Figure 6).

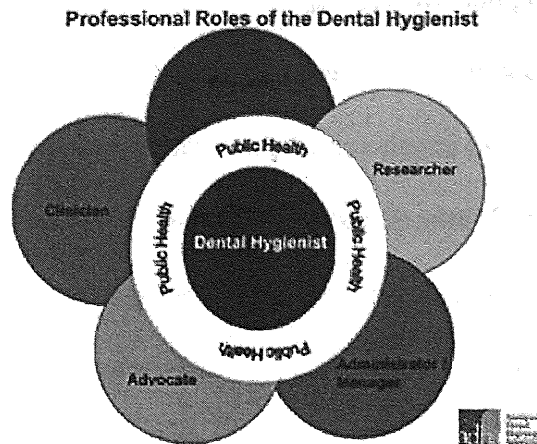


Figure 6: Professional Roles of the Dental Hygienist

Source: American Dental Hygienists' Association. Dental Hygiene Careers. <http://www.adha.org/careerinfo/dhcareers.htm>. Accessed September 28, 2008.

Dental Hygiene Clinician. In direct patient care, a dental hygiene clinician carries out process of care: assessment, diagnosis, planning, implementation, and evaluation within a defined scope of practice.^{39, 40} The process of care provides the foundation for dental hygienists to determine needs, individualize care and ensure that the identified needs are satisfied. Via assessment, a dental hygienist reviews medical, dental, and pharmacology history, takes vital signs, collects information on the health status of the client patient, examines the soft and hard tissues in the oral cavity, head, and neck for signs of health and disease, and records the clinical findings. This phase also involves dental, periodontal, and occlusal assessment, and using diagnostic aids such as radiographs or pulp vitality testing. In the diagnosis phase, a dental hygienist synthesizes, analyzes, interprets the patient's collected data, and identifies a patient unmet human needs related

to dental hygiene. Planning involves establishing priorities and goals, evaluating existing dental hygiene problems, identifying interventions for patient needs, and developing the care plan for therapy. In the implementation phase, a dental hygienist educates patients on self-care strategies for achieving oral and systemic health. Determining preventive and therapeutic services for management of oral disease and health maintenance is also part of implementation. Determining the outcomes of care is part of the evaluation phase of dental hygiene process of care. The process of care is modified when necessary, referrals to and collaboration with other healthcare professionals may be necessary, and continued care intervals are established.⁴¹⁻⁴²

Dental Hygiene Researcher. Research "... is an organized analysis of a problem, issue or question" using the scientific method.⁴³ A dental hygiene researcher investigates current dental hygiene problems to enhance oral healthcare and the practice of dental hygiene.²⁷ According to Darby and Walsh,²⁷ "in any employment setting and role, the contemporary dental hygienist must be able to question, be creative, and think analytically to systematically solve problems and improve oral health."²⁷ A dental hygienist contributes to research by writing literature reviews, clinical case studies or theoretical manuscripts, systemic reviews and meta analysis, and by conducting clinical trials. Research enhances clinical thinking, provides a valid basis for clinical practice, and advance the quality of dental hygiene care and profession.⁴³ Research is vital to advancing the art and science of dental hygiene. Established research agenda provide direction to licensed hygienists on priority research areas that can focus research efforts.^{44, 45}

Research is a component of evidence-based practice, and research knowledge transfer is important for implementing evidence-based practice.⁴⁵ Use of current research

never replaces clinical skills or judgment; rather, it provides another dimension to the decision making process. Evidence-based practitioners use information from systematic reviews and meta analysis for clinical decisions.^{46, 47}

Dental Hygiene Administrator/Manager. The administrator role is most often seen in the oral health product industries such as Procter and Gamble, Hu-Friedy, Butler International, Premier Products Co., and Colgate Palmolive. The administrator/managerial dental hygiene role usually integrates education, research, and public relations for the company. Dental hygienist administrator/manager responsibilities include planning, decision-making, organizing, identifying and managing resources, and evaluating and modifying programs of health, education, or healthcare.⁴⁸ In a private practice setting, dental hygienists may develop policy and procedures, provide in-service education, and complete periodic testing to ensure that all office personnel follow best practices.⁴⁹ In higher education, dental hygiene administrators further direct professional programs for dental hygienists and other similar professions, serve as chairs, deans, or statewide dental program administrators.²⁷

Dental Hygiene Educator/ Oral Health Promoter. The educator role is crucial to improving the oral health of a population. A dental hygiene educator analyzes population needs within the scope of dental hygiene practice and motivates individuals on the importance of needed oral care. A dental hygiene educator further demonstrates the correct use of oral products according to client needs, reinforces desired behavior, and evaluates client outcomes. A dental hygiene educator emphasizes the importance of regular self-oral cancer examination and harmful effects of tobacco use on oral and health

systems.²⁷

Aside from private clinics, dental hygiene educators teach in dental and dental hygiene institutions, public health departments, and the public school system. The responsibilities of a dental hygiene educator in college/university include teaching courses, conducting research, and providing public services. In a school of dentistry, a dental hygiene educator can teach periodontal and preventive oral health concepts and skills in laboratory, clinic, as well as classroom.²⁷

In public health departments, the dental hygienist prepares and distributes oral health educational pamphlets to enhance public oral health knowledge, provides dental screenings, identifies the community oral health needs and influences oral health policy.²⁷

Dental Hygiene Consumer Advocate. Advocacy is a vital component of any profession. A consumer advocate protects and supports patients' right and welfare by presenting accurate information so that clients can make informed decisions about their health and the proposed care plan. A dental hygiene advocate also helps maintain a safe environment, avoids any possible harm to patients, and participates in the legislative process to improve public health and welfare.²⁷

Dental Hygiene Education Model

United States has one of the most advanced and developed system of dental hygiene education in the world. In 2008, there were 296 accredited entry-level dental hygiene programs, 33 of which were baccalaureate, and 22 master's level programs.⁵⁰ All entry-level programs have competency-based curricula (see Appendix A: Competencies for Entry into the Profession of Dental Hygiene). These competencies defines the skills

dental hygienists must possess.⁵¹ Admission requirements and prerequisites differ between dental hygiene programs but generally include a high school diploma, and prerequisite courses in chemistry, English, speech, psychology, sociology, nutrition, chemistry, human anatomy and physiology. All of the accredited dental hygiene entry-level programs in the United States are certificate, associate degree, or baccalaureate degree programs.⁵² An associate degree in dental hygiene prepares dental hygiene clinicians. The dental hygiene baccalaureate degree programs prepares students for research, managerial, and advocacy roles and “to adapt to new roles in an ever-changing environment.”²⁷ Master’s degree in dental hygiene is currently the terminal degree in the United States. Although, master’s degree programs vary, most prepare dental hygienists for leadership roles in higher education, research, or administration.^{27, 52}

Subsequent to the successful completion of dental hygiene education from an accredited dental hygiene institution, dental hygienists in the U.S. are required to pass the National Dental Hygiene Board Examination (NBDHE) as a prerequisite for the licensure examination. The NBDHE is administered by the American Dental Association, Joint Commission on National Dental Examinations. Along with the NBDHE, dental hygienists are required to successfully complete the regional/state clinical examination, which assures the public that dental hygienists are qualified to provide reliable, effective and safe dental hygiene care to the public.⁵³

Dental Hygiene Regulation

Professional regulation refers to the responsibility of a profession to monitor the behavior of its members according to the laws established by the government. The main

purpose of professional regulation is to protect the health, safety, and welfare of the public by licensing healthcare professionals and monitoring their practice for violation of the practice act.^{38, 54} The *practice act* is the state law that regulates the practice of dentistry and dental hygiene.²⁷ Regulations are the specific interpretations of the various laws that determine how the law is implemented. Due to overwhelming responsibilities, the government has delegated regulatory authority to boards consisting mainly of members of the regulated profession, a responsibility known as self-regulation. Given this authority, the regulatory board interprets and ensures consistent application of the practice act. Common components of professional regulation are show in Table 6.³⁸

Table 6. Regulatory Practices Used in Dental Hygiene in the US and Canada

Term	Definition	Purpose
Accreditation	“A formal, voluntary non-governmental process that establishes a minimum set of national standards that promote assure quality in educational institutions and programs and serves as a mechanism to protect the public.” ⁵³	Ensure public protection.
Licensure and Licensure Examination	“ The process whereby a competent authority issues permission to perform a certain act or engage in a specific business that would otherwise be unlawful.” ⁵⁵	Protects the healthcare, safety, and welfare of the public. Controls the number and practice of health professionals.
Continuing Education	Mandatory educational courses completed annually by each hygienist as mandated by the regulatory board.	Enhances professional clinical knowledge, improves patient care and clinical standards.
Regulatory Boards	Have the authority to issue regulation to ensure uniform application of the law and to carry out the intent of the law, e.g., dental boards that regulate dentists and dental hygienists in many states in the United States. ⁵⁵	Set and monitor educational standards. Prepare and administer licensure exams. Set licensure renewal requirements. Interpret the practice acts. Involved in the disciplinary process.

Source: Al-Khamis S. Dental Hygiene Regulation in Kuwait: Present and Future. Non-thesis project in partial fulfillment of the requirement for the degree of master's of science in dental hygiene. Old Dominion University. 2003.

With *self regulation*, the profession establishes its own educational requirements, licensure requirements, and scope of practice. Within the framework of the practice act,

self-regulation gives a profession the responsibility to protect the public from harm or unsafe practitioners while maintaining and encouraging professional practice.⁵⁶⁻⁵⁷ Self-regulation consists of several important elements that demonstrate the following accountability to the public: setting of professional standards; development of a Code of Ethics (see Appendix B); peer review; participation in professional activities and continuing education; research to advance the knowledge base; professional publications; developing and monitoring practice; and the credentialing and certification process. The components of self-regulation are designed to verify that the practitioners are meeting society's trust and maintaining expected standards of practice.^{38, 58}

Under self-regulation, the dental hygiene licensure system would similarly be managed by dental hygienists. Dental hygienists, the experts in dental hygiene, should be granted the responsibility to design, implement, and evaluate dental hygiene licensure system instead of dentists.⁵⁹ Gurenlian⁶⁰ reports that dental hygienists in control of their profession would greatly benefit the profession of dental hygiene. Self-regulation would allow dental hygienists to focus on the profession and control licensure requirements.⁶⁰

Licensure is a way of protecting the public from unsafe, incompetent individuals and practice. For quality assurance, legal jurisdictions require registered dental hygienists to complete a set number of continuing education courses to renew their license.^{57, 61} Dental hygienists are required to provide evidence of participation in continuing education courses approved by regulatory boards; however, hygienists are not required to prove learning or demonstrate competence. Therefore, some researchers believe that mandatory continuing education is an ineffective quality assurance mechanism.⁶² Bilawka and Craig⁵⁷ oppose mandatory continuing education requirements because it

“does not enhance dental hygiene’s professional image. Dental hygienists need to become more accountable to the public and to themselves through proven quality assurance methodologies... .”⁵⁷ Bilawck and Craig⁵⁷ further state that the profession of dental hygiene needs to adapt “evidence-based quality management tools” which would improve the delivery of dental hygiene services.⁵⁷

Access to oral care is an enormous public health issue in the United States and Pakistan. Millions lack access to oral care due to lack of insurance, inadequate distribution of dental providers in their areas, or lack of dentists willing to accept insurance. The majority of the rural, indigent people lack preventive oral health services and far more need restorative oral health services.⁶³ Restrictive dental hygiene supervision laws (see Table 7) are one of the major barriers in accessing oral health care services. Most hygienists in the United States are confined to private dental offices and are restricted from community-based practice where a higher percentages of people have unmet oral health needs. Supervision laws hinder dental hygienists’ ability to provide preventive and therapeutic services throughout the community unless a dentist is present or has authorized the care. A self-regulated dental hygiene profession would allow dental hygienists to reinterpret laws to allow greater access to the indigent, homebound, schoolchildren, and people in long-term facilities.⁵⁹

Table 7. Types of Supervision of Dental Hygiene Practice in the United States

Practice	Definition
General Supervision	Hygienists under general supervision can perform the dental hygiene procedures with the dentists consent but without the dentist presence in the dental operator. Hygienists in states with general dental supervision can perform dental hygiene services in schools, nursing homes, prisons, and public health settings; thus, is preferred over direct supervision. Dental hygienists under general supervision are authorized to perform dental hygiene services when the dentist is away form the office. ⁵⁵
Unsupervised Practice	Dental hygienists can plan and initiate dental hygiene treatment services without the dentists consent. ⁵⁵
Independent Practice	A dental hygienist can own a dental hygiene independent practice and can be directly reimbursed for the dental hygiene services.
Direct supervision	In direct supervision, all the dental hygiene services must be performed in the presence of a dentist. ⁵⁹ Direct supervision restricts dental hygienists from providing the services that they were educated to provide. Direct supervision limits the dental hygienists' ability to provide preventive and therapeutic dental services to the underserved population including the people in nursing homes and school clinics unless a dentist is present.
Indirect Supervision	The dentist authorizes the procedure and remains in the dental office while the dental hygienist performs the procedures.
Collaborative Practice	Dentist and dental hygienists work in a collaborative system as co-therapists to provide oral health care for the patients and the public.

Source: Al-Khamis S. Dental Hygiene Regulation in Kuwait: Present and Future. Non-thesis project in partial fulfillment of the requirement for the degree of master's of science in dental hygiene. Old Dominion University. 2003.

To overcome the oral needs of underserved people and the low number of dental professionals, the American Dental Hygienists' Association has proposed a new profession that builds on the success of dental hygienists, entitled "advanced dental hygiene practitioner" (ADHP). Paralleling the role of a nurse practitioner but focused on oral health, ADHPs will provide basic oral care to the public outside of the private practice setting. ADHPs will practice collaboratively with other health professionals, set

up mobile practices where needed, treat the underserved, i.e., low-income or uninsured persons, the homebound and individuals residing in rural or inner city areas where there is a shortage of dentists. They will provide limited restorative dental services, have prescriptive authority, and provide assessments, oral health education, sealants, and referrals for patients who are outside of the dental care system. Based on the newly proposed clinical competencies and proforma curriculum developed by ADHA, ADHPs will complete post- baccalaureate education that builds on the skills and knowledge of a practicing dental hygienist. This education and training will prepare a master's degree level professional to work collaboratively with other health professionals to meet the American public oral health needs.⁶⁴ In the future Pakistan may benefit from a similar “mid-level practitioner” to overcome oral health disparities.

PROPOSED RECOMMENDATIONS FOR THE REGULATION OF DENTAL HYGIENISTS IN PAKISTAN

As of 2008, there were 8,169 dentists registered with the Pakistan Medical and Dental Council,³⁶ which is inadequate for a population of 152 million^{1,3} people. It is estimated that there is only one dentist for 29,405 people.³⁵ Consequently, an estimated 40,000 non-qualified dental practitioners (dental technicians) are providing dental services in underserved areas of Pakistan. The burden of oral disease is extensive and preventive oral healthcare services and oral self-care behaviors are lacking. Oral diseases such as dental caries, gingivitis, and periodontitis are preventable with increased awareness, oral health therapies, and regular oral screenings. Cancer prevention education and tobacco cessation programs are essential in reduction and elimination of oral cancer incidence in Pakistan. Pakistani citizens lack optimum levels of fluoride in their water supply as well; therefore, they must be educated on the importance of topical fluoride in reducing caries and informed on various supplementary fluoride sources available to reduce caries. The need for dental treatment may be overwhelming for the low ratio of dentists to population; therefore, there is a clear indication for standardized, formal training of dental hygienists to meet the oral needs of the public. There is an extensive need for evidence-based and community-based dental health education and a philosophical change from disease-oriented and pain management care to primary preventive care.

Thus, dental hygiene is one answer to the ongoing oral health crises in Pakistan. The approach to oral healthcare delivery in Pakistan could be changed to a model where

the dental hygienist is the primary care provider of oral health services in rural and public health clinics. Through dental hygienists, the public could receive oral health education. The citizens of Pakistan would be encouraged to adopt healthy lifestyles to enhance their oral and general health and quality of life. The oral health of the citizens of Pakistan can be improved cost-effectively by adopting the dental hygiene model.

In response to the enormous unmet oral health needs, the inadequate supply of dentists, and the current unstructured dental hygiene curriculum, recommendations for a new model of dental hygiene in Pakistan are proposed. Recommendations are predicated on the establishment of a new office within the Pakistan Ministry of Health, called Pakistan Dental Hygiene Council (see Appendix C). The Pakistan Dental Hygiene Council would function similarly to the Pakistan Medical and Dental Council and be responsible for regulation of dental hygiene, establishment of educational standards, requirements and scope of practice, licensure granting and renewal, and disciplinary actions against dental hygienists (see Appendices A through F). The Pakistan Dental Hygiene Council would include representatives from all aspects of dental hygiene education and practice.

Pakistan Dental Hygiene Council will:

- Promulgate a dental hygiene scope of practice to effectively and efficiently utilize dental hygiene services in variety of public health settings (see Appendix D).
- Adapt specific standards of dental hygiene practice in accordance with the Practice Act, Code of Ethics (see Appendix B), and Dental Hygiene Practice

Standards (See Appendix E) as guides for quality practice and as benchmarks for disciplinary action against those who contravene the laws and standards.

Dental Hygiene Education and Practice:

- Dental hygiene licensure candidates shall be graduates of a competency-based accredited, entry-level, dental hygiene education program (see Appendix A).
- The Dental Hygiene Council shall develop educational standards for entry-level dental hygiene programs and guidelines for competency-based dental hygiene curricula.
- Since the baccalaureate degree is crucial to improving dental hygiene's service role to society, Pakistan dental hygienists will be urged to complete the baccalaureate degree in dental hygiene.
- Given the enormous shortage of dental professionals in Pakistan, dental hygiene programs may continue to graduate qualified dental hygienists.
- Dentists should be instructed in dental schools and via continuing education on the utilization of dental hygiene services to enhance productivity and to meet the oral healthcare needs of the Pakistani public.
- Dental hygienists shall at all times follow Dental Hygiene Practice Standards (see Appendix E)
- Dental hygienists shall practice collaboratively with dentists and other healthcare professionals to meet the needs of patients.

National Board Dental Hygiene Examination:

- Prior to licensure, dental hygiene program graduates shall successfully pass a National Board Dental Hygiene Examination to evaluate their knowledge of the scientific basis for practice.
- The Dental Hygiene Council shall be responsible for writing and implementing the National Board Dental Hygiene Examination.

Clinical Competence:

- No clinical examination or simulation examination would be required for licensure. Dental hygiene programs will verify initial clinical competence.
- The Pakistan Dental Hygiene Council shall register newly graduated dental hygienists with temporary licensure for six months. Dental hygienists with temporary licensure will practice as trainees in public oral health care facilities such as Rural Health Centers or Basic Health Units.
- Following six months of continuous full time practice as trainees, the clinical competence must be confirmed in a letter from the public oral healthcare facility director to the Council.
- Dental hygienists shall complete and submit the dental hygiene licensure form accompanied by the letter of endorsement from the oral health care facility director to the Council (see Appendix F).
- Upon consideration of the Council, a two-year license shall be issued by the Pakistan Dental Hygiene Council.

Practice Act and Scope of Practice:

- Dental hygiene practice regulations should be passed into law thereby protecting the citizens of Pakistan from unqualified dental hygienists.

SUMMARY AND CONCLUSION

Mounting evidence suggests that the burden of oral problems in Pakistan is overwhelming. The lack of preventive care is responsible for the oral health problems currently faced by the citizens of Pakistan. There is a tremendous need to augment the oral health knowledge and self care behaviors of the people so that oral diseases can be prevented. Inequity exists in the provision of oral healthcare in Pakistan; the majority of people do not have access to quality oral health services. Consequently, caries, periodontal diseases and oral cancer are prevalent. The number of dentists currently practicing is extremely low for the increasing Pakistan population. The number of formal dental hygiene programs is very limited and their curriculum appears inadequate and unstructured, e.g., curriculum is lacking a specified number of clinical hours and instruction in dental radiology. In response to the unmet oral health needs in Pakistan, a new dental hygiene curriculum, and a new administrative office within the Pakistan Ministry of Health, with full authority to regulate dental hygiene education, practice, and licensure has been proposed. This document provides dental hygienists and the Pakistan Ministry of Health with information regarding best practices that can strengthen the profession of dental hygiene, protect the health and welfare of the population, and enhance the number of qualified dental hygienists. Increasing the number of community-based dental hygienists will improve the Pakistani public's oral health knowledge, prevent oral disease, and help maintain oral health. Moreover, this document proposes a mission, goals, and vision to guide the profession of dental hygiene made up of dental hygienists who are licensed, preventive oral healthcare professionals. The role of the dental hygienist addresses educational, preventive, research, administrative, and

therapeutic services to improve the public's oral health. Since the baccalaureate degree in dental hygiene provides the most comprehensive entry-level competencies, Pakistan dental hygienists should strive to earn baccalaureate degrees as a minimum for entry into practice.

Dental hygienists in Pakistan should have the authority to regulate the dental hygiene profession in order to protect the health, safety, and welfare of the public from incompetent practitioners. Through self-regulation, the Pakistan Dental Hygiene Council will control dental hygiene education, licensure, and practice; and will have the authority to develop, implement, and periodically evaluate the dental hygiene educational standards. It is anticipated that the Pakistan Ministry of Health and the Pakistan Dental Association will support the establishment of a true dental hygiene profession. Collaboratively, they can raise the health and quality of life of all Pakistani citizens.

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APPENDIX A

Competencies for Entry into the Profession of Dental Hygiene*

Foreword

The American Dental Education Association (ADEA), Section on Dental Hygiene Education, Competency Development Committee drafted the competency statements presented in this document. This committee had representation from both baccalaureate and associate degree dental hygiene programs. It also included representation from dental hygiene, clinical, social and basic sciences, and the American Dental Hygienists' Association. A separate committee, the Dental Hygiene Education Competency Draft Review Committee, further reviewed and provided feedback on the document once developed. Following these reviews, the competency statements were presented for public comment at the 1998 ADEA Annual Session, the 1998 Dental Hygiene Directors' Conference, and the ADEA Section on Dental Hygiene Education homepage on the World Wide Web.

The competency statements have been presented in five domains. These domains were defined during a consensus exercise that was conducted at the Section on Dental Hygiene Education program session at the 1997 ADEA Annual Session. Individuals representing various facets of dental hygiene and dental hygiene education participated in this exercise.

Introduction

This document describes the abilities expected of a dental hygienist entering the profession. These competency statements are meant to serve as guidelines. It is important for individual programs to further define the competencies they want their graduates to

possess, describing 1) the desired combination of knowledge, psychomotor skills, communication skills, and attitudes, and 2) the standards used to measure the hygienist's independent performance. The following should help to assess the competence of dental hygiene students and to improve the dental hygiene curriculum. Given the dynamic nature of science and the health professions, these suggestions should be reviewed and updated periodically.

As a participating member of the health care team, the dental hygienist plays an integral role in assisting patients to achieve and maintain optimal oral health. Dental hygienists provide educational, clinical, and consultative services to individuals and populations of all ages, including the medically compromised, mentally or physically challenged, and socially or culturally disadvantaged.

As defined in this document, dental hygienists must exhibit competence in the following five domains:

- 1) The dental hygienist must possess, first, the *Core Competencies (C)*, the ethics, values, skills, and knowledge integral to all aspects of the profession. These core competencies are foundational to all of the roles of the dental hygienist.
- 2) Second, inasmuch as *Health Promotion (HP)/Disease Prevention* is a key component of health care, changes within the health care environment require the dental hygienist to have a general knowledge of wellness, health determinants, and characteristics of various patient/client communities. The hygienist needs to emphasize both prevention of disease and effective health care delivery.
- 3) Third is the dental hygienist's complex role in the *Community (CM)*. Dental hygienists must appreciate their role as health professionals at the local, state, and national levels. This role requires the graduate dental hygienist to assess, plan, and implement programs and activities to benefit the general population. In this role, the dental hygienist must be prepared to influence others to facilitate access to care and services.
- 4) Fourth is *Patient/Client Care (PC)*, requiring competencies described here in ADPIE format. Because the dental hygienist's role in patient/client care is ever-changing, yet central to the maintenance of health, dental hygiene graduates must use their skills to assess, diagnose, plan, implement, and evaluate treatment.

5) Fifth, like other health professionals, dental hygienists must be aware of a variety of opportunities for *Professional Growth and Development (PGD)*. Some opportunities may increase clients' access to dental hygiene; others may offer ways to influence the profession and the changing health care environment. A dental hygienist must possess transferable skills, e.g., in communication, problem-solving, and critical thinking, to take advantage of these opportunities.

Core Competencies (C)

C.1 Apply a professional code of ethics in all endeavors.

C.2 Adhere to state and federal laws, recommendations, and regulations in the provision of dental hygiene care.

C.3 Provide dental hygiene care to promote patient/client health and wellness using critical thinking and problem solving in the provision of evidence-based practice.

C.4 Use evidence-based decision making to evaluate and incorporate emerging treatment modalities.

C.5 Assume responsibility for dental hygiene actions and care based on accepted scientific theories and research as well as the accepted standard of care.

C.6 Continuously perform self-assessment for lifelong learning and professional growth.

C.7 Promote the profession through service activities and affiliations with professional organizations.

C.8 Provide quality assurance mechanisms for health services.

C.9 Communicate effectively with individuals and groups from diverse populations both verbally and in writing.

C.10 Provide accurate, consistent, and complete documentation for assessment, diagnosis, planning, implementation, and evaluation of dental hygiene services.

C.11 Provide care to all clients using an individualized approach that is humane, empathetic, and caring.

Health Promotion and Disease Prevention (HP)

HP.1 Promote the values of oral and general health and wellness to the public and organizations within and outside the profession.

HP.2 Respect the goals, values, beliefs, and preferences of the patient/client while promoting optimal oral and general health.

HP.3 Refer patients/clients who may have a physiologic, psychological, and/or social problem for comprehensive patient/client evaluation.

HP.4 Identify individual and population risk factors and develop strategies that promote health-related quality of life.

HP.5 Evaluate factors that can be used to promote patient/client adherence to disease prevention and/or health maintenance strategies.

HP.6 Evaluate and utilize methods to ensure the health and safety of the patient/client and the dental hygienist in the delivery of dental hygiene.

Community Involvement (CM)

CM.1 Assess the oral health needs of the community and the quality and availability of resources and services.

CM.2 Provide screening, referral, and educational services that allow clients to access the resources of the health care system.

CM.3 Provide community oral health services in a variety of settings.

CM.4 Facilitate client access to oral health services by influencing individuals and/or organizations for the provision of oral health care.

CM.5 Evaluate reimbursement mechanisms and their impact on the patient's/client's access to oral health care.

CM.6 Evaluate the outcomes of community-based programs and plan for future activities.

Patient/Client Care (PC)

Assessment

PC.1 Systematically collect, analyze, and record data on the general, oral, and psychosocial health status of a variety of patients/clients using methods consistent with medico-legal principles.

This competency includes:

a. Select, obtain, and interpret diagnostic information, recognizing its advantages and limitations.

- b. Recognize predisposing and etiologic risk factors that require intervention to prevent disease.
- c. Obtain, review, and update a complete medical, family, social, and dental history.
- d. Recognize health conditions and medications that impact overall patient/client care.
- e. Identify patients/clients at risk for a medical emergency and manage the patient/client care in a manner that prevents an emergency.
- f. Perform a comprehensive examination using clinical, radiographic, periodontal, dental charting, and other data collection procedures to assess the patient's/client's needs.

Diagnosis

PC.2 Use critical decision making skills to reach conclusions about the patient's/client's dental hygiene needs based on all available assessment data.

This competency includes:

- a. Determine a dental hygiene diagnosis.
- b. Identify patient/client needs and significant findings that impact the delivery of dental hygiene services.
- c. Obtain consultations as indicated.

Planning

PC.3 Collaborate with the patient/client, and/or other health professionals, to formulate a comprehensive dental hygiene care plan that is patient/client-centered and based on current scientific evidence.

This competency includes:

- a. Prioritize the care plan based on the health status and the actual and potential problems of the individual to facilitate optimal oral health.
- b. Establish a planned sequence of care (educational, clinical, and evaluation) based on the dental hygiene diagnosis; identified oral conditions; potential problems; etiologic and risk factors; and available treatment modalities.
- c. Establish a collaborative relationship with the patient/client in the planned care to include etiology, prognosis, and treatment alternatives.
- d. Make referrals to other health care professionals.

- e. Obtain the patient's/client's informed consent based on a thorough case presentation.

Implementation

PC.4 Provide specialized treatment that includes preventive and therapeutic services designed to achieve and maintain oral health. Assist in achieving oral health goals formulated in collaboration with the patient/client.

This competency includes:

- a. Perform dental hygiene interventions to eliminate and/or control local etiologic factors to prevent and control caries, periodontal disease, and other oral conditions.
- b. Control pain and anxiety during treatment through the use of accepted clinical and behavioral techniques.
- c. Provide life support measures to manage medical emergencies in the patient/client care environment.

Evaluation

PC.5 Evaluate the effectiveness of the implemented clinical, preventive, and educational services and modify as needed.

This competency includes:

- a. Determine the outcomes of dental hygiene interventions using indices, instruments, examination techniques, and patient/client self-report.
- b. Evaluate the patient's/client's satisfaction with the oral health care received and the oral health status achieved.
- c. Provide subsequent treatment or referrals based on evaluation findings.
- d. Develop and maintain a health maintenance program.

Professional Growth and Development (PGD)

PGD.1 Identify career options within health care, industry, education, and research and evaluate the feasibility of pursuing dental hygiene opportunities.

PGD.2 Develop practice management and marketing strategies to be used in the delivery of oral healthcare.

PGD.3 Access professional and social networks to pursue professional goals.

*American Dental Education Association. Competencies for entry into the profession of dental hygiene (As approved by the 2003 House of Delegates). *Journal of Dental Education*. July 2007; 71(7): 929-933.

APPENDIX B

Code of Ethics for Dental Hygienists*

1. Preamble

As dental hygienists, we are a community of professionals devoted to the prevention of disease and the promotion and improvement of the public's health. We are preventive oral health professionals who provide educational, clinical, and therapeutic services to the public. We strive to live meaningful, productive, satisfying lives that simultaneously serve us, our profession, our society, and the world. Our actions, behaviors, and attitudes are consistent with our commitment to public service. We endorse and incorporate the Code into our daily lives.

2. Purpose

The purpose of a professional code of ethics is to achieve high levels of ethical consciousness, decision making, and practice by the members of the profession. Specific objectives of the Dental Hygiene Code of Ethics are to:

- Increase our professional and ethical consciousness and sense of ethical responsibility.
- Lead us to recognize ethical issues and choices and to guide us in making more informed ethical decisions.
- Establish a standard for professional judgment and conduct.
- Provide a statement of the ethical behavior the public can expect from us.

The Dental Hygiene Code of Ethics is meant to influence us throughout our careers. It stimulates our continuing study of ethical issues and challenges us to explore our ethical responsibilities. The Code establishes concise standards of behavior to guide the public's expectations of our profession and supports existing dental hygiene practice, laws, and regulations. By holding ourselves accountable to meeting the standards stated in the

Code, we enhance the public's trust on which our professional privilege and status are founded.

3. Key Concepts

Our beliefs, principles, values, and ethics are concepts reflected in the Code. They are the essential elements of our comprehensive and definitive code of ethics, and are interrelated and mutually dependent.

4. Basic Beliefs

We recognize the importance of the following beliefs that guide our practice and provide context for our ethics:

- The services we provide contribute to the health and well being of society.
- Our education and licensure qualify us to serve the public by preventing and treating oral disease and helping individuals achieve and maintain optimal health.
- Individuals have intrinsic worth, are responsible for their own health, and are entitled to make choices regarding their health.
- Dental hygiene care is an essential component of overall healthcare and we function interdependently with other healthcare providers.
- All people should have access to healthcare, including oral healthcare.
- We are individually responsible for our actions and the quality of care we provide.

5. Fundamental Principles

These fundamental principles, universal concepts, and general laws of conduct provide the foundation for our ethics.

Universality

The principle of universality assumes that, if one individual judges an action to be right or wrong in a given situation, other people considering the same action in the same situation would make the same judgment.

Complementarity

The principle of complementarity assumes the existence of an obligation to justice and basic human rights. It requires us to act toward others in the same way they would act toward us if roles were reversed. In all relationships, it means considering the values and perspective of others before making decisions or taking actions affecting them.

Ethics

Ethics are the general standards of right and wrong that guide behavior within society. As generally accepted actions, they can be judged by determining the extent to which they promote good and minimize harm. Ethics compel us to engage in health promotion/disease prevention activities.

Community

This principle expresses our concern for the bond between individuals, the community, and society in general. It leads us to preserve natural resources and inspires us to show concern for the global environment.

Responsibility

Responsibility is central to our ethics. We recognize that there are guidelines for making ethical choices and accept responsibility for knowing and applying them. We accept the consequences of our actions or the failure to act and are willing to make ethical choices and publicly affirm them.

6. Core Values

We acknowledge these values as general guides for our choices and actions.

Individual autonomy and respect for human beings

People have the right to be treated with respect. They have the right to informed consent prior to treatment, and they have the right to full disclosure of all relevant information so that they can make informed choices about their care.

Confidentiality

We respect the confidentiality of client information and relationships as a demonstration of the value we place on individual autonomy. We acknowledge our obligation to justify any violation of a confidence.

Societal Trust

We value client trust and understand that public trust in our profession is based on our actions and behavior.

Nonmaleficence

We accept our fundamental obligation to provide services in a manner that protects all clients and minimizes harm to them and others involved in their treatment.

Beneficence

We have a primary role in promoting the well being of individuals and the public by engaging in health promotion/disease prevention activities.

Justice and Fairness

We value justice and support the fair and equitable distribution of healthcare resources.

We believe all people should have access to high-quality, affordable oral healthcare.

Veracity

We accept our obligation to tell the truth and assume that others will do the same. We value self-knowledge and seek truth and honesty in all relationships.

7. Standards of Professional Responsibility

We are obligated to practice our profession in a manner that supports our purpose, beliefs, and values in accordance with the fundamental principles that support our ethics.

We acknowledge the following responsibilities:

To Ourselves as Individuals...

- Avoid self-deception, and continually strive for knowledge and personal growth.
- Establish and maintain a lifestyle that supports optimal health.
- Create a safe work environment.
- Assert our own interests in ways that are fair and equitable.
- Seek the advice and counsel of others when challenged with ethical dilemmas.
- Have realistic expectations of ourselves and recognize our limitations.

To Ourselves as Professionals...

- Enhance professional competencies through continuous learning in order to practice according to high standards of care.
- Support dental hygiene peer-review systems and quality-assurance measures.
- Develop collaborative professional relationships and exchange knowledge to enhance our own life-long professional development.

To Family and Friends

- Support the efforts of others to establish and maintain healthy lifestyles and respect the rights of friends and family.

To Clients...

- Provide oral healthcare utilizing high levels of professional knowledge, judgment, and skill.
- Maintain a work environment that minimizes the risk of harm.
- Serve all clients without discrimination and avoid action toward any individual or group that may be interpreted as discriminatory.
- Hold professional client relationships confidential.

- Communicate with clients in a respectful manner.
- Promote ethical behavior and high standards of care by all dental hygienists.
- Serve as an advocate for the welfare of clients.
- Provide clients with the information necessary to make informed decisions about their oral health and encourage their full participation in treatment decisions and goals.
- Refer clients to other healthcare providers when their needs are beyond our ability or scope of practice.
- Educate clients about high-quality oral healthcare.

To Colleagues...

- Conduct professional activities and programs, and develop relationships in ways that are honest, responsible, and appropriately open and candid.
- Encourage a work environment that promotes individual professional growth and development.
- Collaborate with others to create a work environment that minimizes risk to the personal health and safety of our colleagues.
- Manage conflicts constructively.
- Support the efforts of other dental hygienists to communicate the dental hygiene philosophy of preventive oral care.
- Inform other healthcare professionals about the relationship between general and oral health.
- Promote human relationships that are mutually beneficial, including those with other healthcare professionals.

To Employees and Employers...

1. Conduct professional activities and programs, and develop relationships in ways that are honest, responsible, open, and candid.
2. Manage conflicts constructively.
3. Support the right of our employees and employers to work in an environment that promotes wellness.
4. Respect the employment rights of our employers and employees.

To the Dental Hygiene Profession...

- Participate in the development and advancement of our profession.
- Avoid conflicts of interest and declare them when they occur.
- Seek opportunities to increase public awareness and understanding of oral health practices.
- Act in ways that bring credit to our profession while demonstrating appropriate respect for colleagues in other professions.
- Contribute time, talent, and financial resources to support and promote our profession.
- Promote a positive image for our profession.

- Promote a framework for professional education that develops dental hygiene competencies to meet the oral and overall health needs of the public.

To the Community and Society...

- Recognize and uphold the laws and regulations governing our profession.
- Document and report inappropriate, inadequate, or substandard care and/or illegal activities by any healthcare provider, to the responsible authorities.
- Use peer review as a mechanism for identifying inappropriate, inadequate, or substandard care and for modifying and improving the care provided by dental hygienists.
- Comply with local, state, and federal statutes that promote public health and safety.
- Develop support systems and quality-assurance programs in the workplace to assist dental hygienists in providing the appropriate standard of care.
- Promote access to dental hygiene services for all, supporting justice and fairness in the distribution of healthcare resources.
- Act consistently with the ethics of the global scientific community of which our profession is a part.
- Create a healthful workplace ecosystem to support a healthy environment.
- Recognize and uphold our obligation to provide pro bono service.

To Scientific Investigation...

We accept responsibility for conducting research according to the fundamental principles underlying our ethical beliefs in compliance with universal codes, governmental standards, and professional guidelines for the care and management of experimental subjects. We acknowledge our ethical obligations to the scientific community:

- Conduct research that contributes knowledge that is valid and useful to our clients and society.
- Use research methods that meet accepted scientific standards.
- Use research resources appropriately.
- Systematically review and justify research in progress to insure the most favorable benefit-to-risk ratio to research subjects.
- Submit all proposals involving human subjects to an appropriate human subject review committee.
- Secure appropriate institutional committee approval for the conduct of research involving animals.
- Obtain informed consent from human subjects participating in research.
- Respect the confidentiality and privacy of data.

- Seek opportunities to advance dental hygiene knowledge through research by providing financial, human, and technical resources whenever possible.
- Report research results in a timely manner.
- Report research findings completely and honestly, drawing only those conclusions that are supported by the data presented.
- Report the names of investigators fairly and accurately.
- Interpret the research and the research of others accurately and objectively, drawing conclusions that are supported by the data presented and seeking clarity when uncertain.
- Critically evaluate research methods and results before applying new theory and technology in practice.
- Be knowledgeable concerning currently accepted preventive and therapeutic methods, products, and technology and their application to our practice.

*American Dental Hygienists' Association House of Delegates. 1995. Chicago, Illinois. http://www.ghdhs.org/code_of_ethics.htm. Accessed July 22, 2008.

APPENDIX C

Pakistan Dental Hygiene Council

The Pakistan Dental Hygiene Council is hereby created as the agency for the regulation of the practice of dental hygiene in Pakistan and to carry out the purpose of this article. The Pakistan Dental Hygiene Council shall be under the supervision and control of the Pakistan Ministry of Health. The Council shall consist of six dental hygienist members, one dentist member, and three members from the public. Each member to be appointed by the President of the Council for a term of four years. No members shall serve more than two consecutive terms of four years. Consideration shall be given to having a geographical, political, urban, and rural balance among the board members. Any member of the Council may be removed by the President for misconduct, incompetence, or neglect of duty.^a

Qualifications of the Council members^a

1. A person shall be qualified to be appointed to the Council if such person:
 - (a) Is a citizen of Pakistan;
 - (b) Is currently licensed as a dentist or dental hygienist and
 - (c) Has been actively engaged in a clinical practice in Pakistan for at least five years immediately preceding the appointment, if fulfilling the position of dentist or dental hygienist on the Council.
2. A person convicted of a felony in Pakistan or any other country of violating this article or any law governing the practice of dentistry shall not be appointment to or serve on the Council.

Quorum of Council^a

A majority of the members of the Council shall constitute a quorum for the transaction of business, but if less than a quorum is present on the day appointed for a meeting, those present may adjourn until a quorum is present. Any action taken by a quorum of the assigned council shall constitute action by the Council.

Powers and Duties of the Council^a

1. The Council shall exercise the following powers and duties:
 - a. Conduct examinations to ascertain the qualifications and fitness of applicants for licensure to practice dental hygiene. To assist with such examinations:
 - i. Only proctors or licensed dental hygienists may participate in the examination of candidates for dental hygiene licensure; and
 - ii. Only licensed dental hygienists, dentists, or proctors may participate in the examination of candidates for dental hygiene licensure.
 - b. Make, publish, declare, and periodically review such reasonable rules as may be necessary to carry out and make effective the powers and duties of the council as vested in it by this article. Rules of the council may include but shall not be limited to:
 - i. The examination of applicants for licensing as dental hygienists;
 - ii. The practices of dental hygiene;
 - iii. The tasks and procedures that may be assigned to dental hygiene;

- iv. The specification of essential instructions to be included in a laboratory work order.
- c. Conduct hearings to revoke, suspend, or deny the issuance of a license or renewal license granted under the authority of this article or of previous laws, issue a confidential letter of concern, issue a letter of admonition, or reprimand, censure, or place on probation a licensee when evidence has been presented showing violation of any of the provisions of this article by a holder of or an applicant for a license. The council may elect to hear the matter .
- d. Conduct investigations and inspections for compliance with the provisions of this article;
- e. Grant and issue licenses and renewal certificates in conformity with this article to such applicants as have been found qualified. The council may also grant and issue temporary licenses. The council shall promulgate rules concerning the granting of temporary licenses, which rules shall include, but not be limited to, restrictions with respect to effective dates, areas of practice that may be performed, and licensing fees that may be charged to the applicant.
- f. Make such reasonable rules as may be necessary to carry out and make effective the powers and duties of the council as vested in it by the provisions of this article.

Limitation on Authority

The Dental Hygiene Council shall have no regulatory or disciplinary authority with regard to dentists, dental assistants, dental lab technicians, or any other auxiliary dental personnel.

Our Mission^b

It is the mission of the Pakistan Dental Hygiene Council to safeguard the dental health of Pakistan by developing and maintaining programs to:

1. Ensure that only qualified dental hygienists are licensed to provide dental hygiene care;
2. Ensure that violators of laws and rules regulating dental hygiene are sanctioned as appropriate.

Our Philosophy^b

The Pakistan Dental Hygiene Council will act in accordance with the highest standard of ethics, accountability, efficiency, and openness. The council will meet the public trust vested in it by regulating the practice of dentistry aggressively, yet in a balanced and sensible manner.

The council is authorized to prescribe and enforce regulations and to perform those acts compatible with and authorized by, either directly or by implication, the laws of Pakistan for the purpose of implementing the provisions of this article.

1. Dental Hygiene Defined^c

- 1.1 A dental hygienist shall be an individual who has completed an accredited dental hygiene education program, passed the national dental hygiene board and is licensed

by the Pakistan Dental Hygiene Council to provide, as an auxiliary to the dentist, preventing care services including, but not limited to, scaling and polishing. In fulfilling these services, dental hygienists provide treatment that helps to prevent oral disease such as dental caries and periodontal disease and for educating patients in prevention of these and other dental problems.

- 1.2 The work of dental hygienists while working in the office of a regularly licensed and registered dentist shall be unsupervised Practice. Dental hygienists recognized by the Pakistan Dental Hygiene Council when making public demonstrations of dental hygiene for educational purposes shall be under the general supervision and direction of regularly licensed and registered dentists.
- 1.3 The Pakistan Dental Hygiene Council may prohibit any dental hygienist from rendering service that it feels is not in the best interest of the public welfare.

2. Examinations for License^e

- 2.1 No person who desires to practice dental hygiene in Pakistan shall be licensed until that person has passed an examination by the council. Applicants for examination shall apply in writing to the council for an examination at least thirty (30) days before the examination and shall upon application pay a nonrefundable fee of 1000 rupees.
- 2.2 An applicant for licensure by examination as a dental hygienist who is a graduate of a dental hygiene school accredited by the Pakistan Dental Hygiene Council shall:
 - (a) Be of good moral character, be possessed of a high school education and have attained the age of eighteen (18) years;

- (b) Exhibit with the application a diploma or certificate of graduation from the Pakistan Dental Hygiene Council accredited dental hygiene school; and
- (c) Have successfully completed the National Board Dental Hygiene Examination.

3. **Licenses to Be Exhibited**^a

All candidates practicing dental hygiene shall at all times display his or her license in a conspicuous place in his office in plain view of patients. Duplicate copies of the dental hygiene license will be available upon request from the council. The provisions of this section shall not apply to any dental hygienist while he is serving as a volunteer providing dental hygiene services in an underserved area of Pakistan.

4. **Unauthorized Practice of Dental Hygiene by Unlicensed Person**^c

- 4.1 No person shall practice, attempt to practice or offer to practice dental hygiene without first having been authorized and issued a license by the Council; nor shall any person practice, attempt to practice, or offer to practice dental hygiene during any period of suspension of his or her license by the Council or after revocation or being voided for failure to reregister by the Council of any license previously issued to the offending person.
- 4.2 Licenses shall be renewed biennially.
- 4.3 A person who has never been issued a license to practice dental hygiene or whose license has been suspended, voided or revoked by action of the council, shall not perform any act that would constitute the practice of dental hygiene.

5. Revocation or Suspension; Other Sanctions^d

The Council may refuse to admit a candidate to any examination, refuse to issue a license to any applicant, suspend for a stated period or indefinitely, or revoke any license or censure or reprimand any licensee or place him or her on probation for such time as it may designate for any of the following causes:

- 5.1 Fraud, deceit or misrepresentation in obtaining a license;
- 5.2 The conviction of any felony or the conviction of any crime involving moral turpitude;
- 5.3 Use of alcohol or drugs to the extent that such use renders him unsafe to practice dentistry or dental hygiene;
- 5.4 Any unprofessional conduct likely to defraud or to deceive the public or patients;
- 5.5 Intentional or negligent conduct in the practice of dentistry or dental hygiene which causes or is likely to cause injury to a patient or patients;
- 5.6 Employing or assisting persons whom he knew or had reason to believe were unlicensed to practice dentistry or dental hygiene;
- 5.7 Publishing or causing to be published in any manner an advertisement relating to his or her professional practice which (i) is false, deceptive or misleading, (ii) contains a claim of superiority, or (iii) violates regulations promulgated by the Board governing advertising;
- 5.8 Mental or physical incompetence to practice his profession with safety to his or her patients and the public;
- 5.9 Violating, assisting, or inducing others to violate any provision of this chapter or any Board regulation;

- 5.10 Conducting his or her practice in a manner contrary to the standards of ethics of dentistry or dental hygiene;
- 5.11 Practicing or causing others to practice in a manner as to be a danger to the health and welfare of his patients or to the public;
- 5.12 Practicing outside the scope of the dentist's or dental hygienist's education, training, and experience;

6. Dental Hygiene Licensure^a

Subsequent to the initial registration period, a licensee's annual registration (renewal) will occur on the first day of the month that follows the last month of licensee's initial dental hygiene license registration period.

No person shall practice dental hygiene unless he or she possesses a current, active, and valid license from the Pakistan Dental Hygiene Council. The licensee shall have the right to practice dental hygiene in Pakistan for the period of his license as set by the Council.

7. Graduate of Foreign Dental Hygiene Schools^a

An applicant for a license to practice dental hygiene who is a graduate of a foreign dental hygiene school shall:

- a. Present evidence of having completed a dental hygiene program at an accredited institution;
- b. Pass the Pakistan National Board Dental Hygiene Examination designed to test the applicant's dental hygiene skills and knowledge.

- c. Complete the Licensure Application for Foreign Dental Hygiene Graduates for a temporary license (See Appendix G).
- d. The Pakistan Dental Hygiene Council shall issue foreign dental hygienists temporary licensure for six months.
- e. Following 6 months of continuous full-time practice, clinical competence must be confirmed by the director of the public health care facility, in a letter to the council.

8. Retired Dental Hygiene License^a

A retired license may be issued only if the applicant provides a written notice to the Council stating that, after a date certain, the applicant shall not practice dental hygiene, shall no longer earn income as a dental hygiene administrator or consultant, and shall not perform any activity that constitutes practicing dental hygiene.

Licensees who desire to change a retired license to an active license and have not practiced at least one year out of the five years immediately preceding application for an active license, must document and certify to the Council how they have maintained their professional ability, skills, and knowledge. All documentation and certification must be submitted to the Council for review. Any plan to reestablish competency must be submitted to and be pre-approved by the Council.

Adapted from:

- a. Colorado Board of Dental Examiners. <http://www.dora.state.co.us/Dental/Statute.pdf>. Accessed July 28, 2008.

- b. Texas State Board of Dental Examiners.
http://www.tsbde.state.tx.us/index.php?option=com_content&task=view&id=73&Itemid=93. Accessed July 28, 2008.
- c. Mississippi State Board of Dental Examiners. http://www.msbde.state.ms.us/msbde/msbde.nsf/webpages/Laws_PracticeAct?OpenDocument. Accessed July 28, 2008.
- d. Virginia Board of Dental Examiners. http://www.dhp.state.va.us/Dentistry/leg/Chapter_27_Dentistry.doc. Accessed July 28, 2008

Appendix D

Dental Hygiene Scope of Practice

Dental hygienists are authorized to perform the following services:

- Gathering and assembling information including, but not limited to, fact-finding and patient history, oral inspection, and dental and periodontal charting;
- Periodontal probing and assessment
- Treatment planning
- Educating patients on the oral health findings and suggesting ways to improve the treatment outcome
- Scaling supra and sub-gingival as it pertains to the practice of dental hygiene
- Root planing
- Polishing to remove extrinsic stain for the teeth.
- Application of fluorides and other recognized topical agents for the prevention of oral disease

Dental Hygiene Practice Settings

Dental hygienists practice dental hygiene in various settings including:

- Clinical practice
 - General
 - Orthodontic
 - Prosthodontic
 - Periodontic
- Acute and long-term healthcare centers and institutions
- Public health and community health clinic

- Homecare and other outreach programs
- Primary healthcare centers
- Educational institutions (for example university, colleges, public schools)
- The military
- Research institutions
- Industry (dental product companies)
- Regulatory boards
- Government (policy and planning)
- Forensic laboratories

Adapted from:

Colorado Board of Dental Examiners. <http://www.dora.state.co.us/Dental/Statute.pdf>. Accessed July 28, 2008.

Al-Khamis S. Dental Hygiene Regulation in Kuwait: Present and Future. Unpublished, non-thesis project in partial fulfillment of the requirement for the degree of Master's of Science in dental hygiene. Old Dominion University. 2003.

Appendix E

Dental Hygiene Practice Standards*

PROFESSIONAL RESPONSIBILITIES AND CONSIDERATIONS

Dental hygienists are responsible and accountable for their dental hygiene practice, conduct, and decision making. Throughout their professional career in any practice setting a dental hygienist is expected to:

- Understand and adhere to the Dental Hygiene Code of Ethics.
- Maintain a current license to practice.
- Demonstrate respect for the knowledge, expertise and contributions of dentists, dental hygienists, dental assistants, dental office staff, and other health care professionals.
- Articulate the roles and responsibilities of the dental hygienist to the patient, interdisciplinary team members, referring providers, and others.
- Apply problem-solving processes in decision-making and evaluate these processes.
- Demonstrate a professional image and demeanor.
- Recognize diversity. Incorporate cultural and religious sensitivity in all professional interactions.
- Access and utilize current, valid, and reliable evidence in clinical decision making through analyzing and interpreting the literature and other resources.
- Maintain awareness of changing trends in dental hygiene, health and society that impact dental hygiene care.
- Support the dental hygiene profession through annual membership.
- Interact with peers and colleagues to create an environment that supports collegiality and teamwork.
- Take actions in situations where patient safety and well-being is potentially or actually compromised.
- Contribute to a safe, supportive and professional work environment.

- Participate in activities to enhance and maintain continued competence, address professional issues as determined by appropriate self-assessment.
- Commit to lifelong learning to maintain competence in an evolving health care system.

DENTAL HYGIENE PROCESS OF CARE

The purpose of the dental hygiene process of care is to provide a framework within which individualized needs of the patient can be met; and to identify the causative or influencing factors of a condition that can be reduced, eliminated, or prevented by the dental hygienist. There are five components to the dental hygiene process of care. These include assessment, dental hygiene diagnosis, planning, implementation and evaluation. This document expands the process to include a sixth component, documentation. All components are interrelated and depend upon evaluation to determine the need for change in the care plan. These *Standards* follow the dental hygiene process of care to provide a structure for clinical practice that focuses on the provision of patient-centered comprehensive care.

STANDARDS OF PRACTICE

Standard 1: Assessment

Assessment is the systematic collection, analysis and documentation of the oral and general health status and patient needs. The dental hygienist conducts a thorough, individualized assessment of the person with or at risk for oral disease or complications. The assessment process requires ongoing collection and interpretation of relevant data. A variety of methods may be used including radiographs, diagnostic tools, and instruments.

I. Patient History:

- a. Record personal profile information such as demographics, values and beliefs, cultural influences, knowledge, skills and attitudes.
- b. Record current and past dental and dental hygiene oral health practices.
- c. Collection of health history data includes the patient's:
 1. current and past health status
 2. diversity and cultural considerations (e.g. age, gender, religion, race and ethnicity)
 3. pharmacologic considerations (e.g. prescription, recreational, over the counter (OTC), herbal)

4. additional considerations (e.g. mental health, learning disabilities, phobias, economic status)
5. take vital signs and compare with previous status
6. consultation with appropriate healthcare provider(s) as indicated.

II. Perform a comprehensive clinical evaluation which includes:

- a. A thorough examination of the head and neck and oral cavity including an oral cancer screening, evaluation of trauma and a temporomandibular joint (TMJ) assessment.
- b. Evaluation for further diagnostics including radiographs.
- c. A comprehensive periodontal evaluation that includes the documentation of:
 1. Full mouth periodontal charting:
 - Probing depths
 - Bleeding points
 - Suppuration
 - Mucogingival relationships/defects
 - Recession
 - Attachment level/attachment loss
 2. Presence, degree and distribution of plaque and calculus
 3. Gingival health/disease
 4. Bone height/bone loss
 5. Mobility and fremitus
 6. Presence, location and extent of furcation involvement
- d. A comprehensive hard tissue evaluation that includes the charting of conditions and oral habits.

1. demineralization
2. caries
3. defects
4. sealants
5. existing restorations and potential needs
6. anomalies
7. occlusion
8. fixed and removable prostheses
9. missing teeth

I. Risk Assessment:

Risk assessment is a qualitative and quantitative evaluation gathered from the assessment process to identify the risks to general and oral health. The data provides the clinician with the information to develop and design strategies for preventing or limiting disease and promoting health.

Examples of factors that should be evaluated to determine the level of risk (high, moderate, low):

- a. Fluoride exposure
- b. Tobacco exposure including smoking, smokeless/spit tobacco and second hand smoke
- c. Nutrition history and dietary practices
- d. Systemic diseases/conditions (e.g. diabetes, cardiovascular disease, autoimmune, etc.)
- e. Prescriptions and over-the-counter medications, and complementary therapies and practices (e.g. herbal, vitamin and other supplements, daily aspirin)
- f. Salivary function and xerostomia
- g. Age and gender
- h. Genetics and family history

i. Habitual and lifestyle behaviors

- Substance abuse (recreational drugs, alcohol)
- Eating disorders
- Piercing and body modification
- Oral habits (citrus, toothpicks, lip/cheek biting)
- Sports and recreation

j. Physical disability

k. Psychological and social considerations

- Domestic violence
- Physical, emotional, or sexual abuse
- Behavioral
- Psychiatric
- Special needs
- Literacy
- Economic
- Stress

Standard 2: Dental Hygiene Diagnosis

The dental hygiene diagnosis is a component of the overall dental diagnosis. The dental hygiene diagnosis is the identification of an existing or potential oral health problem that a dental hygienist is educationally qualified and licensed to treat. The dental hygiene diagnosis is “the use of critical decision making skills to reach conclusions about the patient’s/client’s dental hygiene needs based on all available assessment data.”

- I. Analyze and interpret information from multiple data sources to evaluate clinical findings and formulate the dental hygiene diagnosis.
- II. Determine patient needs that can be improved through the delivery of dental hygiene care.

III. Incorporate the dental hygiene diagnosis into the overall dental treatment plan.

Standard 3: Planning

Planning is the establishment of goals and outcomes based on patient needs, expectations, values, and current scientific evidence. The dental hygiene plan of care is based on assessment findings and the dental hygiene diagnosis. The dental hygiene treatment plan is integrated into the overall dental treatment plan. Dental hygienists make clinical decisions within the context of ethical and legal principles.

- I. Identify, prioritize and sequence dental hygiene intervention (e.g. education, treatment, and referral).
- II. Coordinate resources to facilitate comprehensive quality care (e.g. current technologies, adequate personnel, appropriate appointment sequencing and time management).
- III. Collaborate with the dentist and other health/dental care providers.
- IV. Present and document dental hygiene care plan to patient.
- V. Explain treatment alternatives, risks, benefits and prognosis.
- VI. Obtain and document informed consent and/or informed refusal.

Standard 4: Implementation

Implementation is the delivery of dental hygiene services based on the dental hygiene care plan in a manner minimizing risk and optimizing oral health.

- I. Review and implement the dental hygiene care plan with the patient.
- II. Modify the plan as necessary and obtain consent.
- III. Communicate with patients appropriate for age, language, culture and learning style.
- IV. Confirm the plan for continuing care.

Standard 5: Evaluation

Evaluation is the process of reviewing and documenting the outcomes of dental hygiene care. Evaluation occurs throughout the process of care.

Appendix F

Licensure Application for Pakistan Dental Hygienists

Please fill all information on this form.

Personal Information :		
Name :		
Date of Birth:	Gender:	Nationality:
Phone Number:		
Father's Name :		
Home Address :		
Home Phone :		
Office Address :		
Type of Practice:		
Date of Last Practice:		
Office Phone:		
National Identification number :		
E- Mail address :		

Academic Qualification

Degree	Completion Year	Name of the Institution	Address of the Institution

I, _____, hereby certify that the above provided information is correct to the best of my knowledge and I have carefully read and fully understand the dental hygiene practice act.

Signature _____ Date: _____

Please submit the following with your application:

1. Photocopies of academic documents.
2. Two passport size photographs taken not more than six months ago.
3. Prof of immunity to or inoculation against the hepatitis B virus.
4. Prof of absence of Tuberculosis.
5. Photocopy of National ID Card
6. Fee: _____
7. Letter of endorsement from the public dental hygiene care facility director.

Appendix G

Licensure Application for Foreign Dental Hygiene Graduates

Please fill all information on this form.

Personal Information :		
Name :		
Date of Birth:	Gender:	Nationality:
Phone Number:		
Father's Name :		
Home Address :		
Home Phone :		
Office Address :		
Type of Practice:		
Date of Last Practice:		
Office Phone:		
National Identification number :		
E- Mail address :		

Academic Qualification

Degree	Completion Year	Name of the Institute	Address of the Institution

I, _____, hereby certify that the above provided information is correct to the best of my knowledge and I have carefully read and fully understand the dental hygiene practice act.

Signature _____ Date: _____

Please submit the following with your application:

1. Photocopies of academic documents.
2. Two passport size photographs taken not more than six months ago.
3. Prof of immunity to or inoculation against the hepatitis B virus.
4. Prof of absence of Tuberculosis.
5. Photocopy of National ID Card
6. Fee: _____
7. Letter of endorsement from the public dental hygiene care facility director.