

PROPOSAL TO ESTABLISH A PROGRAM  
OF GRADUATE STUDIES IN DENTAL HYGIENE AT UCSF FOR THE M.S. DEGREE

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**DRAFT**

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## Table of Contents

<b>SECTION 1. INTRODUCTION</b> .....	4-18
1.1 Aims and Objectives of the Program.....	4
1.2 Contextual Factors, Overview of the Field, Historical Development, and Institutional Strengths.....	4-14
1.3 Timetable for Development of the Program.....	14
Table 1: Timeline to develop the MS.....	14-15
1.4 Relationship to Existing Campus Programs & the Academic Plan.....	15-16
1.5 Relationship of the Program with Other UC Institutions.....	17
1.6 Department or Group that will Administer the Program.....	17
1.7 Plan for Evaluation of Program .....	17-18
<b>SECTION 2. PROGRAM</b> .....	18-27
2.1 Candidates for the Master's Degree in Dental Hygiene.....	18
2.2 Foreign Language Requirement.....	18
2.3 Program of Study.....	18-25
Table 2: MS Goals, Outcomes, Learning Methods, Assessments, and Competencies.....	20-22
Table 3: Proposed Courses, Content, Skills, and Assessment.....	23
2.4 Oral Qualifying Examinations .....	24
2.5 Field Work.....	24-25
2.6 Thesis.....	25
2.7 Comprehensive Examination.....	25
2.8 Relationship of Master's and Doctor's Programs.....	26
2.9 Special Preparation for Careers in Teaching.....	26
2.10 Normative Time from Matriculation to Degree.....	26
<b>SECTION 3. PROJECTED NEED</b> .....	26-27
3.1 Student Demand for Program.....	26
3.2 Opportunities for Placement of Graduates.....	26-27
3.3 Importance to the Discipline.....	27
3.4 Ways in which the Program will Meet the Needs of Society.....	27
3.5 Relationship of the Program to Research and/or Professional Interests of the Faculty.....	27
3.6 Program Differentiation.....	27
<b>SECTION 4. FACULTY</b> .....	27-28
<b>SECTION 5. COURSES</b> .....	29-34
5.1 Proposed New Core Courses .....	30-34
5.2 Proposed Existing Core Courses .....	34
<b>SECTION 6. RESOURCE REQUIREMENTS</b> .....	35-36

6.1	FTE Faculty.....	35
6.2	Library Acquisition.....	35
6.3	Computing Costs.....	35
6.4	Equipment.....	35
6.5	Space and Other Capital Facilities.....	35
6.6	Other Operating Costs.....	35-36
6.7	Multiple Sites for Teaching.....	36
<b>SECTION 7. GRADUATE STUDENT SUPPORT.....</b>		<b>36</b>
7.1	Support Policy.....	36
7.2	Sources of Support.....	36
<b>SECTION 8. CHANGES IN SENATE REGULATIONS.....</b>		<b>36</b>
<b>REFERENCES.....</b>		<b>37-38</b>
<b>APPENDIX A:</b> UCSF Letters of Support from UCSF Administrators and Dental Hygiene Professional Organizations		
<b>APPENDIX B:</b> External Letters of Support and Commitment from All Directors of Basic Preparation Dental Hygiene Educational Programs in California		
<b>APPENDIX C:</b> Program Administrative & Oversight Committees		
<b>APPENDIX D:</b> Comprehensive Examination Options, Areas to be Addressed & Evaluation Criteria		
<b>APPENDIX E:</b> MSDH Academic Review Form		
<b>APPENDIX F:</b> Sample Job Listings for Dental Hygienists with Advanced Degrees		
<b>APPENDIX G:</b> Faculty Biosketches		
<b>APPENDIX H:</b> Faculty Letters of Commitment		
<b>APPENDIX I:</b> Draft Course Forms		

# A Proposal to Establish a Program of Graduate Studies in Dental Hygiene at UCSF for the M.S. Degree

## SECTION 1: INTRODUCTION

### 1.1 Aims and Objectives

The **mission** of the Department of Preventive and Restorative Dental Sciences (PRDS) at the University of California San Francisco (UCSF) School of Dentistry (S/D) is to lead the world in improving the oral health of the public through advancements in education, research, service and their application to preventive and restorative care.

The UCSF S/D seeks to establish a new multidisciplinary curriculum of graduate study leading to a Master of Science Degree in Dental Hygiene (MS). Graduates will be prepared to engage in multidisciplinary problem solving related to oral disease prevention and health promotion across the lifespan to improve the oral health of varied populations. Graduates will be prepared to assume roles in education and research collaboration in academic and public health settings and in the oral healthcare industry. After this MS degree is established, a DrDH program will be proposed with a focus on dental hygiene research related to oral disease prevention and health promotion. (See Appendix A for letters of support from UCSF administrators and from Dental Hygiene Professional organizations. Also see Appendix B for letters of support and commitment from all Dental Hygiene Program Directors in California.)

### 1.2 Contextual Factors, Overview of the Field, Historical Development, and Institutional Strengths

#### 1.2.1. Contextual Factors

Many reasons can be cited for enacting the current proposal to develop a program of rigorous academic studies for graduate dental hygienists including:

- 1) **The need to do more to eliminate oral health disparities:** The U.S. Surgeon General reported in May 2000, that a “silent epidemic” of oral diseases is affecting the most vulnerable segments of our population --- children who live in poverty, the elderly, populations with low income and educational levels, special needs, those who live in communities without access to oral health services, and many members of racial and ethnic minority groups. Multiple factors exacerbate oral health disparities: the current structure of the oral healthcare delivery system; maldistribution of providers; lack of diversity among providers; restrictive regulatory statutes; geographic, educational and cultural barriers; oral health literacy; and financing of care.<sup>1,2,3</sup> In 2003, the Surgeon General released A National Call to Action to Promote Oral Health highlighting that oral health is essential to health and well being at every stage of life and urging the public, health professionals, and policymakers to improve efforts to increase the affordability and accessibility of oral health care to the underserved.<sup>4</sup> The report urged partnerships at local, state and national levels to engage in programs to promote oral health and disease prevention.<sup>2</sup> Leaders in Dental Hygiene are

needed to help create effective interdisciplinary strategies to improve access to dental hygiene care.

- 2) **The oral health-systemic connection:** Oral health is an integral part or overall health. Oral tissues reflect and affect general health and disease. Oral tissues not only signal presence of general disease, disease progression, or exposure to general health risk factors, they also act as a portal of entry for infections. Examination of oral tissues can detect microbial infections, immune disorders, and some cancers.<sup>4</sup> Associations between chronic oral infection and systemic health have been reported for diabetes, cardiovascular and lung disease, stroke, brain abscess, low birth weight and premature births, underscoring the importance of oral health services for all individuals. Oral health also is related to quality of life since oral problems compromise ability to chew food, diet, nutrition, sleep, psychological status, social interactions, intimacy and ability to function at school and work.<sup>4</sup> For example, an estimated 54 million lost school hours per year have been reported in California due to children's oral health problems.<sup>5</sup> Improving the oral health and thus the general health of all Americans and of high risk persons in other countries requires comprehensive collaboration across disciplines. Dental disease prevention, oral health promotion and treatment of oral infection are essential elements of comprehensive, multidisciplinary healthcare. Creative multidisciplinary approaches to address oral disease prevention and health promotion are needed to solve existing and emerging problems. Academic leaders in Dental Hygiene are needed to bring the dental hygiene perspective to the problem solving process.
- 3) **The shortage of dental hygiene educators:** In California, two-year basic preparation programs have increased from 5 in 1962 to 23 in 2007 and they continue to increase in the state and in the Nation. There is a strong need for qualified faculty to teach and direct these professional programs. The growing need for dental hygiene educators and administrators is well documented.<sup>11,6</sup> A 2002-03 survey of 264 entry-level dental hygiene programs in the U.S. conducted by the American Dental Education Association concluded with regard to entry-level dental hygiene educational programs that "there is in fact not only a current faculty shortage, particularly in the area of culturally diverse educators, but the dearth of qualified faculty will likely be of critical proportions in the very near future." The same survey reported that 38% of the dental hygiene programs responding had unfilled faculty vacancies due to a lack of qualified applicants. In addition, 68% of dental hygiene program directors indicated a need to replace fulltime faculty within the next 5 years due to projected retirement.<sup>7, 11</sup> Compounding the problems associated with the very small number of dental hygienists entering academic careers is the aging of the current faculty and the potential leadership vacuum in the near future caused by the retirement of the current dental hygiene educators.<sup>11</sup> The University's system-wide Health Sciences Committee (HSC) 2005 report entitled the University of California Health Sciences Education Workforce Needs and Enrollment Planning cites "current and looming faculty shortages" as one of the most relevant current challenges facing "health sciences education as an enterprise" in California and

nationally.<sup>8</sup>

- 4) **Increased geriatric demand for dental hygienists:** Between 2004 and 2020 the older adult population is expected to grow at more than twice the rate of the total population. The number of individuals aged 65 and older in California is already higher than any other state in the Nation. It is projected that by 2025, in California there will be a 58% increase in people 65-84 years old and a 49% increase in those 85 years and older.<sup>8</sup> In addition, the older adult population is more racially and ethnically diverse, and are concentrated in key states such as California, New York, Florida and Pennsylvania. Unlike previous generations, this elder population is expected to retain many of their teeth and want oral health professionals to manage and provide their care.<sup>8</sup>

The current and projected demographic changes in the numbers, composition, and proportion of older adults within the population have a major impact on our society and important policy implications for federal, state, and local governments. For example, as of October 1990, nursing home facilities must ensure that all residents be provided with emergency oral care, furnished with a referral list of dentists, and have dental care – preventive and therapeutic – as promulgated by the State Medicaid Act. The U.S. Bureau of Labor statistics has projected that the demand for dental hygienists will increase by 37% or more between now and the year 2010 with a concomitant increased demand for dental hygiene educators and educational programs.<sup>9,10</sup>

- 5) **The supply of, and demand for, health professionals:** As of 2007, nationally there are 289 accredited dental hygiene programs and 56 accredited dental schools. According to the American Dental Education Association,<sup>3</sup> the number of graduates from dental hygiene programs continues to outpace those of dental schools. The rate of growth for dental hygienists from 2004-2014 is projected at 43.3%<sup>9,10,11</sup> With regard to the supply of and demand for health professionals and changing scope of practice, the University's system-wide 2005 report on the University of California Health Sciences Education Workforce Needs and Enrollment Planning states: "The prevalence of managed care has led to changing needs for different numbers and types of providers. Expansion of the scope of practice, and related changes in billing and payment rights create, for some providers, (e.g., optometrists, pharmacists, nurse practitioners, physician assistants, and dental hygienists), opportunities to redefine the boundaries between professions that deliver similar services and to train an interdisciplinary workforce." Therefore, capacity building is needed to prepare academic leaders and educators in Dental Hygiene to participate in interdisciplinary healthcare workforce discussions and to address innovation in educational programs required.

The reasons discussed above create an imperative to develop a program of rigorous academic studies for graduate dental hygienists. As a premier university devoted solely to the health sciences, UCSF is uniquely positioned to develop a multidisciplinary program that brings to bear the expertise of faculty in basic biomedical, social, and behavioral sciences; clinical science; geriatrics, epidemiology, dental public health, and health policy. The next generation of dental hygiene educators, researchers, clinicians,

and policy leaders in oral disease prevention and health promotion need to be well-trained in how to draw upon and integrate skills, perspectives, and expertise provided by all of these disciplines.

### 1.2.2. Overview of the Field

Dental Hygiene as a discipline is the study of preventive oral healthcare including the management of behaviors to prevent oral disease and to promote health.<sup>12,13,14, 15</sup> The four inter-related paradigm concepts selected for study are the Client, the Environment, Health/Oral Health, and Dental Hygiene Actions. The concept of the *Client* is viewed as a biological, psychological, spiritual, social, cultural, and intellectual human being and includes individuals, families, groups and communities of all ages, ethnicities and sociocultural and economic states. The *Environment* is defined as the milieu in which the client and dental hygienist find themselves. The Environment affects the client and the dental hygienist and both are capable of influencing the environment. The concept of Environment includes dimensions such as political, economic, educational, geographic, legal, physical, social, ethnic, and cultural factors that influence health and oral health. The concept of *Health/Oral Health* is viewed as the client's state of being that exists on a continuum from optimal wellness to illness and fluctuates over time as the result of biologic, psychological, spiritual and developmental factors. Oral health and overall health are interrelated because each influences the other. The concept of *Dental Hygiene Actions* is viewed as interventions that a dental hygienist can initiate to promote oral wellness and to prevent or control oral disease. These actions may be provided in independent, interdependent, and collaborative relationships with the client and other healthcare professionals. These four global paradigm concepts central to the discipline of Dental Hygiene have been and continue to be further defined and expanded into various conceptual models that drive dental hygiene education, research, and practice.<sup>16,17,18,19,20,21</sup>

As oral healthcare professionals, dental hygienists are licensed and serve as clinicians, oral health educators, managers, consumer advocates, change agents, and researchers.<sup>22,23,24,25</sup> They pursue careers in clinical practice, public health, private industry, academia, or with other government agencies. In clinical practice, they provide care to prevent oral disease and promote health in private dental offices, hospitals, and convalescent homes. Dental hygienists employed in public health settings (e.g., community clinics; nursing homes; elementary, middle, and high schools) screen for oral healthcare needs, plan oral health programs, and provide clinical and educational services.<sup>26</sup> Dental hygienists employed in private industry participate in research and development and product marketing programs. Finally, dental hygienists employed in university, state, and community college academic arenas, are responsible for the professional education of student dental hygienists and other healthcare professionals and engage in research. Currently the estimated number of dental hygienists in California is 53 per 100,000 population.<sup>27</sup>

Graduate education in Dental Hygiene began in the 1950s with the opening of master's degree programs in Dental Hygiene at Columbia University, University of Michigan, University of Iowa, and University of Missouri at Kansas City. Currently, there are 12 Master of Science Degree programs in Dental Hygiene located in the following

educational institutions: University of Iowa, University of Missouri at Kansas City, Baylor College of Dentistry, a Component of the Texas A&M University System Health Science Center; Old Dominion University, Norfolk, VA; Idaho State University; University of North Carolina at Chapel Hill; University of New Mexico; University of Texas Health Science Center at San Antonio; University of Maryland; West Virginia University; Medical College of Georgia, and the University of Tennessee. The curricula of these programs emphasize teacher preparation and include a research component to prepare graduates to engage in scholarly activity and to contribute to research in academic settings. To date, there are no doctoral programs in dental hygiene.

### **1.2.3. Historical Development**

Dental hygiene as a field of study began in 1913 when Dr. Alfred C. Fones of Bridgeport, Connecticut, organized a course of formal training in oral prophylaxis for young women. In 1918, UCSF established a one year program in Dental Hygiene. The course of study was lengthened to two years in 1924 upon recognition that the development of technical skills alone was insufficient and that knowledge and understanding of basic and dental sciences were necessary to provide optimum dental hygiene care.<sup>12</sup> From its inception, the incorporation of the UCSF dental hygiene curriculum into the UCSF pre-doctoral dental curriculum made the UCSF basic preparation dental hygiene educational program unique and of very high quality. In 1941, under the leadership of the S/D Dean, Dr. Guy S. Millberry, the Bachelor of Science degree in Dental Hygiene was approved. The purpose of the UCSF Bachelor of Science degree in Dental Hygiene program was to prepare biomedically-oriented, technically-skilled dental hygiene practitioners and oral health educators.

In 1978, UCSF S/D was one of the first institutions in the nation to receive a federal grant to initiate advanced dental hygiene training in the administration of intraoral local anesthetics, nitrous oxide-oxygen analgesia, and gingival soft tissue curettage. Based on the success of this training program, in 1979, the State of California became one of the first to legislate these expanded dental hygiene functions which are now legal for dental hygienists to perform in 38 states.

In 1997, Assembly Bill (AB) 560 was passed in California creating a new licensing category for dental hygienists, the Registered Dental Hygienist in Alternative Practice (RDHAP). AB 560 allows the RDHAP to provide dental hygiene care without supervision of a dentist: in the following settings: residences for the homebound, schools, residential facilities and other institutions, and in dental health professional shortage areas, as certified by the Office of Statewide Health Planning and Development. The RDHAP licensing category was created in response to the need to increase the efficiency and availability of oral healthcare for older adults and children. Currently, California has the largest elderly population in the nation and this group is expected to grow at more than twice the rate of the total population by 2020<sup>8</sup>. Moreover, with the expected 22.3% growth in total population in California counties by 2015, the number of children requiring dental care will increase substantially.<sup>8</sup>

In 2003, the UCSF S/D declared a moratorium on its Bachelor of Science Degree in Dental Hygiene program. One reason cited in the final white paper report of the

Systemwide Health Science Committee on Dental Education and the University of California was:

“In recent years, California’s community colleges expanded their capacity to grant associate degrees in dental hygiene, which fully qualify the holder for state licensure.... The current suspension of new enrollments in the [UCSF baccalaureate entry-level dental hygiene] program will permit the faculty to restructure the program to offer ... a master’s program”.<sup>26</sup>

Thus, the proposed new MS Degree in Dental Hygiene program has been identified as a need in the 2006 UCSF S/D’s Five Year Strategic Plan and will be the only MS Degree in Dental Hygiene program offered in California.

#### **1.2.4. Institutional Strengths**

UCSF has several programs, institutes, and centers from which to draw faculty resources. The proposed new degree program will be enriched by several other educational activities that are now in place. These are listed below:

##### **1.2.4.1. S/D Department of Preventive and Restorative Dental Sciences (PRDS)**

The PRDS Department includes the Divisions of Behavioral Sciences, Professionalism and Ethics; Biomaterials and Bioengineering; General Dentistry; Endodontics; Oral Epidemiology and Dental Public Health, and Prosthodontics. One of the great strengths of the PRDS Department is the quality, size, and diversity of the faculty. The Department conducts multidisciplinary instruction, research, and patient care programs through its 6 Divisions. Faculty in this department will become course leaders or guest lecturers in the proposed MS courses. For example, the didactic training in Research Methods and Design integrated into the proposed MSDH curriculum will draw from an existing course in the Division of Oral Epidemiology and Dental Public Health. In addition, the proposed new MS courses will be housed in this Department. Research in the department spans the spectrum from behavioral to basic science through translation to clinical research. Additionally, several PRDS faculty working in the following research groups housed in PRDS may become research mentors for MS in Dental Hygiene students as well as guest lecturers in the proposed MS courses.

- The Center to Address Disparities in Children’s Oral Health, a non-ORU center, with a research mission to identify cultural, environmental, workforce, behavioral and biological factors associated with health disparities among ethnic/racial groups in the very diverse California environment; to enhance our ability to target children likely to be at risk for dental caries; and to provide successful interdisciplinary interventions to prevent disease and reduce oral health disparities.
- The Caries Management by Risk Assessment Research Group that leads the world in studying caries balance and prevention and management of dental caries by risk assessment and management.

- The Bio-Engineering research group that is a national leader in the understanding of dental hard tissues and clinically induced degradation of dental restorations, and the Biomaterials, Biosciences and Engineering program
- The Center for Health Improvement and Prevention, a multi-disciplinary research team that aims to improve health outcomes by conducting clinically-relevant behavioral research.
- The Dental Public Health Residency Program, the only one on the West Coast, and includes a Dental Public Health seminar series with many relevant topics.

In addition, the Department of PRDS has formal affiliations with 8 Northern California basic preparation dental hygiene educational programs and the 23 state-wide community clinic programs both rural and urban which will provide opportunities for field work for MS Degree in Dental Hygiene students.

#### **1.2.4.2. S/D Department of Orofacial Sciences (OFS)**

The Department of Orofacial Sciences houses the Divisions of: Craniofacial Anomalies; Oral Medicine, Oral Pathology and Oral Radiology; Orthodontics; Pediatric Dentistry; and Periodontology. Research in the Department covers a broad spectrum of basic, translational and clinical sciences that complement the clinical activities of the Department. These include extramurally funded studies of oral mucosal and salivary gland diseases, including those common in people with HIV infection (conducted through the Oral AIDS Center), oral cancer, xerostomia, Sjogren's Syndrome (the Sjogren's International Collaborative Clinical Alliance), and new methods for diagnosing and treating periodontal diseases. In addition, clinical research studies assess the effect of orthodontic treatment on the form and function of the craniofacial complex, new approaches to imaging, the interrelationships of the neuromuscular systems on muscle function and bone growth, and seek to understand the variations in outcome of interdisciplinary treatment of patients with craniofacial anomalies. Studies of enamel and dentin formation are key to new initiatives for tissue engineering of tooth structures, as well as for understanding dental pathologies such as fluorosis and amelogenesis imperfecta.

Patient treatment services provide the highest level of patient care focusing on the latest and most effective treatment methods. The Oral Medicine Clinical Center specializes in the diagnosis and treatment of oral soft tissue and salivary gland diseases and serves as the basis for predoctoral student education. The Oral Pathology Diagnostic Laboratory offers world-class tissue diagnostic services for dental and medical practitioners. Orthodontics provides state-of-the-art care for children and adults with dental malocclusions. Pediatric Dentistry provides primary and tertiary care for dental diseases and prevention for infants and children. Periodontology focuses on the diagnosis and management of the various periodontal conditions and provides treatment with osseointegrated implants. The Center for Craniofacial Anomalies provides multidisciplinary consultation and comprehensive treatment of children with various birth defects. One of the great strengths of this Department is the quality and diversity of the faculty. The Department also supports the S/D teaching programs focusing primarily on dental students. Faculty in this department may become mentors for MS students and will provide lectures in the proposed MS courses.

#### **1.2.4.3. S/D Department of Oral and Maxillofacial Surgery (OMFS)**

The Department of OMFS teaches both theoretical and clinical courses in the predoctoral dental curriculum and offers instruction in medial emergencies. Basic research in the Department includes investigations of the mechanisms of bone growth and replacement, the use of lasers, mechanisms of pain, and studies of treatment and outcomes of implant, orthognathic, temporo-mandibular joint, and reconstructive surgeries. The department provides clinical care in oral and maxillofacial surgery to ambulatory patients at the Dental Clinics Building, the postgraduate OMFS Clinic at Moffitt Hospital, and the oral and maxillofacial surgery clinic at San Francisco General Hospital (SFGH). Treatment for hospitalized patients is provided at Moffitt/Long Hospital, SFGH, UCSF/Mount Zion, and Veterans Affairs Medical Center. The department also provides elective courses in oral and maxillofacial surgery at SFGH and implant clerkships where students learn to assist with surgical procedures. Faculty in this department may become mentors for MS students as well as provide lectures in the proposed MS courses.

#### **1.2.4.4. S/D Department of Cell and Tissue Biology (CTB)**

The Department of CTB has active research programs in cell and developmental biology, tissue remodeling and repair, genesis and progression of head and neck cancers, and molecular pathogenesis, and the study of oral biofilm. Currently PRDS collaborates with OFS to fund an FTE dedicated to the study of oral biofilm. National Institutes of Health-supported centers and programs in this department include the Comprehensive Oral Health Research Center which focuses on strategies for promoting tissue repair, the UCSF Oral Cancer Research Center, which is concerned with the genesis and progression of oral cancer, and a project to catalogue the salivary proteome. The Department also is the home for the UCSF campus-wide program in Craniofacial and Mesenchymal Biology (CMB). This program focuses on basic and translational research related to cellular and morphogenetic processes underlying development. The Department is also one of the founders of the new UCSF campus-wide Program in Microbial Pathogenesis. Research within the department related to this area currently focuses on bacterial adherence mechanisms, oral candidiasis, and viral infections in the placenta and immune protection. Faculty in the Department teach in the Biomedical Sciences course sequence in the DDS pre-doctoral program, with a focus on human anatomy and embryology, head and neck anatomy, histology and neuroscience. CTB faculty also teach in the Biomedical Sciences Graduate Program and Oral and Craniofacial Sciences Graduate Program. Faculty in this department may become mentors for MS students as well as guest lecturers in the proposed MS courses.

#### **1.2.4.5. S/D Center for Health Professions**

The mission of this Center is to assist healthcare professionals, health professions schools, care delivery organizations and public policy makers respond to the challenges of educating and managing a healthcare workforce capable of improving the health and well being of people and their communities. The Center focuses its efforts on understanding the challenges faced by the healthcare workforce and developing programs and resources that assist in making successful transitions to the emergent healthcare systems. Faculty associated with this Center

will teach the required leadership course series in the MSDH curriculum and may become mentors for MS students as well as guest lecturers in the other proposed MS courses.

#### **1.2.4.6. School of Nursing (SON) Department of Physiological Nursing**

The UCSF Department of Physiological Nursing offers a curriculum to prepare Gerontological Nurse Practitioners. As part of the proposed MS program in Dental Hygiene, N295A, offered by the Department of Physiological Nursing, has been integrated into the proposed MS curriculum as a core required course. Dental Hygiene graduate students will receive didactic training in care of the older adult by nursing faculty in collaboration with dental hygiene faculty already trained in course content. The latter will supervise and evaluate assigned course-related projects completed by dental hygiene graduate students. In addition, nursing faculty in this Department will become mentors for MS Dental Hygiene students as well as guest lecturers in other courses in the MS curriculum.

#### **1.2.4.7. SON Department of Social and Behavioral Sciences (SBS)**

The SON Department of SBS offers courses of study leading to a PhD in Medical Sociology, with major emphasis on the sociology of health, medicine, and healthcare systems, and also courses of study for nurses leading to an MS or PhD with a concentration in health policy. S222 and S211 A, B, C courses, taught by Department of Social and Behavioral Sciences faculty, will be included as a required course in the MSDH curriculum. Faculty from SBS may mentor graduate MSDH students in the development of their field projects and also may provide guest lectures in the proposed MS program.

#### **1.2.4.8. SON John Hartford Center for Excellence in Geriatric Nursing**

The UCSF/John A. Hartford Center of Geriatric Nursing Excellence (HCGNE), housed in the Department of Physiological Nursing (HCGNE) is one of five centers in the United States to build academic geriatric capacity. The mission of the UCSF HCGNE is to prepare critically necessary academic leadership in teaching, gerontological research, and practice in geriatric nursing, with the goal of improving the quality of life of older Americans by alleviating the problems that older people face each day. The HCGNE will provide MSDH students the opportunity to participate in cutting-edge research under the leadership of world-renowned research scientists. Currently PRDS Faculty also are members of this center and support collaborative research.

#### **1.2.4.9. UCSF Academic Geriatric Resource Center (AGRC)**

The mission of the UCSF AGRC is to address the unique health care needs of the rapidly growing population of older adults in California by providing geriatric education to healthcare providers and by advancing public education and research in geriatrics. Currently PRDS Faculty are involved with this Center in assisting with the up-dating of oral health content in the on-line geriatric curriculum for health professionals. This on-line curriculum will be incorporated as part of the proposed MS in Dental Hygiene Program as part of the core course on Dental Hygiene and Oral Disease Prevention and Management by Risk Assessment. In addition, students with interests in geriatrics may be mentored by faculty associated with the AGRC.

#### **1.2.4.10. UCSF Institute for Global Health (IGH)**

The Institute for Global Health, a division of Global Health Sciences, is an organized research unit (ORU) within the School of Medicine that supports international health research and some teaching at the School of Medicine and the School of Public Health at the University of California, Berkeley (UCB).

The IGH will be a source of research project linkages and placements for the MS students as they pursue their experiential learning since IGH has linkages with several field sites for research and training activities. Students with interests in infectious diseases may be mentored by IGH faculty. (Pending)

#### **1.2.4.11. Center for Tobacco Control Research and Education (CTCRE)**

The CTCRE is a campus-wide non-ORU center that provides a focal point for work of 30 faculty members from all four schools at UCSF and the School of Public Health at UCB. The center aims to reduce 450 million deaths worldwide that tobacco and the tobacco industry cause each year. The work of the Center spans policy and historical research, economics, public health interventions, basic science (particularly around secondhand smoke and nicotine pharmacology) and clinical interventions. The Center houses an interdisciplinary postdoctoral fellowship program and has provided research opportunities for students in medicine and nursing as well as MPH and PHD students from UCB. The work is designed to inform and improve the effectiveness of public health and clinical interventions to reduce tobacco use. It works closely with the UCSF Library's efforts to collect and preserve millions of pages of previously secret tobacco industry documents, such as those available at the Legacy Tobacco Documents Library. The Center can offer library resources and possible mentorship to masters students in dental hygiene who are interested in tobacco-related projects. (Pending)

#### **1.2.4.12. Center for Health and Community (CHC)**

The CHC, a non-ORU center, was established to assess the challenges of the changing healthcare delivery environment and identify policies and interventions that will maximize the beneficial impact of the changing healthcare delivery system. The Center is comprised of interdisciplinary programs and individual faculty from all UCSF Schools who have been engaged in health services and policy-related research for many years. A major focus of the research is in health disparities worldwide. CHC programs offer graduate degrees in social and behavioral sciences related to health through the Department of Behavioral and Social Sciences and the Department of Anthropology, History, and Social Medicine. Faculty from this Center may provide lectures and mentorship to students involved in the proposed MS program. (Pending)

#### **1.2.4.13. Center for Translational Science Community Engagement Program (CTSI)**

One of the goals of this program is to identify healthcare practitioners who wish to collaborate on clinical and translational research with faculty at UCSF. This CTSI component could provide a resource for MSDH students via their faculty mentors.

### 1.2.4.14. Summary of Strengths

UCSF clearly has the intellectual capital and programmatic resources to initiate an MS program in Dental Hygiene Sciences that will attract new scholars throughout the UC and California State University systems, as well as from other institutions nationally, and internationally. The proposed new interdisciplinary MSDH program will offer a program of rigorous academic studies in dental hygiene sciences to prepare academically motivated dental hygienists to engage in multidisciplinary problem solving related to oral disease prevention and health promotion across the lifespan to improve the health of at-risk people throughout the world. Graduates will assume roles as educators and research collaborators in academic and public health settings and in the oral healthcare-related industry.

### 1.3 Timetable for Development, Including Enrollment Projections

We have developed a new overall curriculum in Dental Hygiene Sciences. PRDS plans for students to matriculate into the program beginning in the Summer of 2009. The program anticipates initially enrolling 2 students per year, and increasing to a total of 4 students in the program. Funding from the PRDS Department is committed for startup to support administrative and faculty time (Total faculty FTE = 1.0). Once approval of the program is received, we will advertise for admissions into the next full academic year. The proposed timeline for developing the MS program is shown in Table 1.

**Table 1: Timeline**

	<b>Proposal</b>	<b>Budget</b>	<b>Faculty</b>	<b>Students</b>
8/07	Draft revised MSDH proposal and submit to S/D Dean and then Faculty Council			
9/07	Submit MSDH proposal to Graduate Division			
10/07	Submit MSDH proposal to Graduate Council			
11/07	Revise		Recruitment of course guest lecturers	
12/07	Revise		Confirmation of guest lecturers	
1/08	Submit for approval By Graduate Council	Budget submission to budget office		
2/08	Graduate Council Approval			
4/08	Submit to Academic Senate Executive Committee  Academic Senate Executive Committee approval  Approval of Divisional Academic Senate			
5/08	Submit to Chancellor Chancellor Approval			

6/08	Submit to Systemwide Coordinating Committee of Graduate Affairs (CCGA)			
9/08	CCGA approval			
10/08	Office of the President approval			
11/08			Begin faculty meeting on courses	Recruit Students
12/08			Website & Portfolio design & programming Begins	
1/09			Finalize course Content	Applications Due; review student applications
2/09			Faculty and course development continue	2009 class Admitted
3/09			Course forms submitted for approval	
4/09			Launch website resources.	
6/09			Courses begin	First students begin program

#### **1.4. Relation of Program to Existing Programs on Campus and the Campus Academic Plan**

The proposed MSDH program will be the first in the UC system and in the California State University system to provide graduate education in Dental Hygiene. The program's administrative home will be in the Department of PRDS. An Executive Committee established within the Department will oversee the proposed MS program (Appendix C) in collaboration with the Graduate Division. The Executive Committee will assure that where there is programmatic overlap, the program will make maximal use of existing resources and attempt to avoid duplication.

The proposed program is fully consonant with the UCSF Academic Mission of enhancing health worldwide and "...to attract and educate the nation's most promising students to future careers in the health sciences and healthcare professions...and to "serve the community at large through educational and service that take advantage of the knowledge and skills of UCSF faculty, staff and students". In addition, the proposed MSDH program has been included in the UCSF S/D's 2006 Five Year Strategic Plan.

Historically, the graduate program in Oral and Craniofacial Sciences, formerly known as the M.S. in Oral Biology program, in the UCSF S/D has enrolled six dental hygienists over the last 30 years (one in 1977; one in 1980; one in 1988; one in 1989; one in 1992; and one in 2003). In 1989, UCSF approved 9 units of graduate courses in Dental Hygiene (DH202, DH201A,B,C and DH203A,B,C) as part of a special track for dental hygienists enrolled in the MS in Oral

Biology Program. These graduate dental hygiene courses have been modified for inclusion as foundation core courses in the proposed MSDH program.

The proposed MSDH program will serve a different student population than that served by the graduate program in Oral and Craniofacial Sciences. The Oral and Craniofacial Sciences program focuses on the study of tissue and cell biology, clinical research, bioengineering, and epidemiology rather than focusing on the discipline of dental hygiene as it relates to oral disease prevention and health promotion from the perspective of social, cultural, political, economic, educational, and environmental determinants of health. The MSDH program will meet the needs of dental hygienists who seek advanced training in oral disease prevention and health promotion across the lifespan and who aspire to become academic dental hygiene educators to meet the documented current and projected faculty shortage.

Another graduate program somewhat related to the proposed MSDH program is the M.S. program in Health Policy in the UCSF School of Nursing. That M.S. program, however, is targeted to nurses and we do not expect that the MSDH program will have any influence on the number of students enrolled in that degree program. Although students in the MSDH program are likely to take some courses sponsored by this nursing health policy graduate program, faculty teaching efforts are not expected to be diverted from existing contributions.

The MSDH program will have little effect on the number of students enrolled in the pre-doctoral dental program at UCSF. There may, however, be a slight beneficial effect to pre-doctoral dental clinical instruction from the contributions made by MSDH students as part of their field work. For example, MSDH students could assist with the teaching of pre-doctoral dental students in such areas as administration of intra-oral local anesthetics, ergonomics, dental charting, head/neck cancer screening, nitrous-oxide oxygen sedation, periodontal scaling/root planing, the oral prophylaxis, periodontal maintenance therapy, and professionalism.

The proposed new multidisciplinary MSDH program is consistent with the University's system-wide Health Sciences Committee (HSC) 2005 report entitled the *University of California Health Sciences Education Workforce Needs and Enrollment Planning*.<sup>8</sup> That report cites "current and looming faculty shortages" as one of the most relevant current challenges facing "health sciences education as an enterprise" in California and nationally.

## **1.5 Relationship of Program with Other UC Institutions**

Other UC campuses offer a M.A. degree in Education. These programs are not particularly similar to the proposed program. For example, our proposed MSDH program will focus on the incorporation of dental hygiene theories and practices related to teaching methodologies and administrative requirements specific to basic preparation dental hygiene education, (i.e., entry-level programs that prepare students for clinical practice). Moreover, emphasis will be placed on the curriculum application of themes including the oral health-systemic health connection; prevention and management of oral disease by risk assessment across the lifespan; health promotion and oral disease prevention with a focus on community organization; and determinants of oral health in individuals and groups that influence oral health, health disparities, and access to care.

The flavor of a graduate program is a reflection of the research by the faculty and graduate students associated with that program. Most of the faculty members choosing to join this program have a mission orientation affecting the choice of research related to the increased understanding of oral disease prevention, management, and health promotion and/or geriatric research. The proposed MSDH program will be a unique training opportunity, different from any existing graduate programs in the University of California. Thus, the proposed program will not compete with any existing programs.

The MSDH program will interact with basic preparation dental hygiene educational programs outside the university and/or the predoctoral dental program in the UCSF S/D. These programs will provide potential sites for field work for MSDH students.

## **1.6 Department or Group that will Administer the Program**

The Department of PRDS will administer the Program (see Appendix C for planned administrative and oversight committees). As the sponsoring Department, PRDS will recruit faculty, provide necessary administrative space, and organize administrative support for the program, thus integrating the MS program with other ongoing PRDS activities). The MSDH Program Director (Dr. M Walsh), a Professor in the Department of PRDS, will be responsible for the day-to-day oversight of the MSDH program. The UCSF Graduate Division will review academic policies and processes as mandated.

### **1.6.1. Student Academic Advisors**

The Program Director will have the responsibility to:

- Approve study lists quarterly
- Meet with students annually to review and sign the MSDH Academic Review Form that includes a checklist of required courses and projects (Appendix F)
- Advise on program procedures
- Ensure that necessary program requirements are completed
- Counsel on such things as course progress, oral qualifying exam, field work, and the comprehensive examination (the Capstone Project)

### **1.7. Plan for Evaluation of Program (within Department and Campuswide)**

The MSDH Executive Committee of the Department of PRDS will initially review the program mid-year in the first year of the program and then every year thereafter to help refine and improve the program. The reviews will include confidential student evaluations as well as interviews with faculty, current students, and graduates of the program. This review will permit adjustments to the program as it matures.

In addition, the internal review will include an assessment of the career outcomes of the graduates of the program. At two and five years post graduation, each graduate will be requested to submit a curriculum vitae (for extracting current position, peer reviewed publications, grant funding, professional leadership roles etc) and to complete a survey assessing the impact of the program on their current skills and expertise, and how the program affected their career choice, ability to obtain a desired job, and career satisfaction.

Finally, the proposed MSDH program will be reviewed every five years by a group of outside consultants under the direction of the Graduate Council, as are all graduate academic programs.

## **SECTION 2: PROGRAM**

### **2.1 Candidates for the Master's Degree in Dental Hygiene**

Candidates must meet the following minimum requirements:

- Graduated from a basic preparation dental hygiene program
- Completed a baccalaureate degree
- Demonstrate a high level of interest and potential to pursue a career as a dental hygiene educator and research collaborator in academia, public health settings, or in the oral healthcare-related industry
- Submit an application that includes a student narrative describing the individual's career objectives;
- Complete a personal interview with members of the admissions committee
- Complete the GRE test
- Have a Minimum GPA of 3.2

**2.2 Foreign Language:** Not required.

**2.3. Program of Study :**

#### **2.3.1. Plan for a Master's Program**

The MS in Dental Hygiene will conform to the Master's of Science Plan II, which requires 36 units of coursework and a comprehensive examination (i.e., Capstone Project). The purpose of an MS degree in Dental Hygiene is to provide graduate dental hygiene students with the knowledge and skills to synthesize related evidence from clinical research, dental public health, behavioral and social sciences, and health policy information, as well as the leadership tools, to solve oral disease prevention and health promotion problems in various settings.

The curriculum committee charged with creating the master's degree courses began its deliberations with the definition of the knowledge and skills of a hypothetical MS Dental Hygiene graduate. Table 2 outlines specific skill-based goals for the program along with expected outcomes and competencies, learning methods, and means of assessment to of those outcomes. Each didactic course is designed to support these competencies and skills.

The proposed one-year degree program will consist of three quarters of interdisciplinary dental hygiene science course work and one quarter of field work at either a partner educational institution (a basic preparation dental hygiene program or pre-doctoral dental program), an established research group in an area of student interest, a public health setting, or in the healthcare industry. The coursework will center on case-based learning and will integrate findings from clinical research on oral health and disease,

dental public health, behavioral and social sciences and health policy information to promote dental hygiene problem solving strategies to prevent oral disease and promote health across the life span among individuals, families and communities. In addition, a longitudinal seminar in the Summer and Fall Quarters will focus on development of competencies in preparation for the Field Work Proposal, the Oral Qualifying Exam, and field work. In the Spring Quarter seminar, students will integrate the material covered in the previous courses with the knowledge and perspective gained from their field work and will present written and oral presentations for their Comprehensive Examination (the Capstone Project). The courses that comprise the proposed MS in Dental Hygiene Sciences are listed in Table 3



Goal	Outcome	Learning Method(s)	Assessment	Competency
Graduates will:				
Understand age-specific differences in oral disease risk assessment, preventive strategies, and management of the dental hygiene client across care settings	<p><b>By the end of the program graduates will be able to:</b>            Interpret and analyze differences in oral risk assessment among different age groups (infants, toddlers, children, adolescents, and younger and older adults) and explain how risk categories affect prevention and management of oral disease across the life span</p> <p>Integrate information obtained from case-based presentations and explain how risk factors modulate oral disease susceptibility and influence its onset, progression, severity and need for treatment</p> <p>Understand barriers to translating emerging science into practice-based decision-making</p>	Didactic classes  Case studies  Seminar discussions  On-line basic courses	Learning portfolio  Small group projects	Develop prevention and disease management strategies for clients with known risk factors for specific oral diseases  Interpret research findings and translate them into an action program plan for development  Develop intervention strategies to address barriers to behavior change among healthcare providers
Have a firm grasp of ethical issues related to dental hygiene and oral disease prevention and health promotion practice, research, and policy development	<p><b>By the end of the program graduates will be able to:</b>            Apply ethically sound research in a variety of settings</p> <p>Obtain institutional review board approval to conduct research studies that involve human beings</p>	Small group seminars  Didactic sessions  Case based tutorials	Learning portfolio  Scholarly project  Small group seminars	Apply ethical principles to program plans  Successfully obtain human subjects clearance for dental hygiene research protocols

Goal	Outcome	Learning Method(s)	Assessment	Competency
Graduates will:				
Understand the research process and different types of research methods and designs appropriate for solving oral disease prevention and health promotion problems	<b>By the end of the program graduates will be able to:</b> Use evidence-based approaches to answer a dental hygiene problem, select an appropriate research design for specific questions, critique a research paper by assessing hypothesis design, plan, population and validity of research findings	Didactic sessions  Seminar discussions  Field work to participate in a research experience	Learning portfolio  Scholarly project  Small group seminars	Develop appropriate plan of implementation and evaluation and analyze field data using appropriate quantitative and qualitative tools
Master principles of theory-based dental hygiene educational practices	<b>By the end of the program graduates will be able to:</b> Explain at least one educational theory and apply that theory to a dental hygiene educational problem related to dental hygiene curriculum development and to explain at least one teaching-learning theory	Didactic sessions Seminars Field work to participate in a teaching practicum	Learning portfolio  Scholarly project  Small group seminars	Develop program goals for a basic preparation dental hygiene curriculum based on a selected school of thought about the following paradigm concepts of Dental Hygiene: Health/Oral Health, Dental Hygiene Clients, Dental Hygiene Actions, and the Environment in which Dental Hygiene Actions occur  Develop a program overview for a basic preparation dental hygiene curriculum that maps program goals, outcomes, learning methods, assessments, and competencies
Apply dental hygiene leadership skills	<b>By the end of the program graduates will be able to:</b> Respond to the challenges of educating and managing a healthcare workforce capable of improving the health and well being of people and their communities	Case-based learning, Speaking and presentation training, Writing workshops, Guest speakers who have been in leadership positions	Learning portfolio  Scholarly project  Small group seminars  Field work	Set priorities for small or large organizations  Manage change and conflict resolution at the interpersonal and organizational level  Demonstrate cultural sensitivity and diplomacy, as administrators, scientists, and teachers

**Table 3: Proposed Courses, Content, Skills, and Assessments\***

	<b>Summer</b>	<b>Units</b>	<b>Fall</b>	<b>Units</b>	<b>Winter</b>	<b>Units</b>	<b>Spring</b>	<b>Units</b>
<b>Block Title</b>	Introduction to Dental Hygiene Science	10	Dental Hygiene and Oral Disease Prevention & Health Promotion	12	Dental Hygiene Field Work & Leadership	6	Applied Dental Hygiene Sciences	8
<b>Courses</b>	<b>DH 200A:</b> Dental Hygiene Science Seminar <b>DPH 210:</b> Introduction to Research Methods and Design <b>DH 201:</b> Dental Hygiene Curriculum Development and Methods of Instruction <b>DPHH 200:</b> Ethical and Behavioral Considerations in Clinical and Research Aspects of Dentistry	3  2  3  2	<b>DH 200B:</b> Dental Hygiene Science Seminar <b>DH 202:</b> Dental Hygiene and Oral Disease Prevention and Management by Risk Assessment <b>N295A:</b> Care of Older Adults <b>S211A:</b> Basic Topic in Leadership in Health Care Systems	3  4  3  2	<b>DH 203:</b> Dental Hygiene Field Work  <b>S211B:</b> Managing Change in Health Care Systems	4  2	<b>DH 200C:</b> Dental Hygiene Science Seminar (Evaluation of field work; analysis of data, write-up, and oral presentation)  <b>S222:</b> Health Care Economics and Policy  <b>S211C:</b> Leadership Development & Self-Renewal	3  3  2
<b>Faculty</b>					Field work mentor			
<b>Key content</b>	Theories, principles, history, and ethics of dental hygiene, research, education and practice; methods and analysis of observational studies		Relationship of oral health to general health & various diseases; oral disease prevention & management based on risk assessment over the lifespan (prenatal, infant, child, adolescent, adult, older adult) & related policies		Field work Project  Team building and leadership		Evaluation of field work quantitative and qualitative analysis of data	
<b>Key skills</b>	Dental hygiene curriculum development and teaching methodologies; Quantitative and qualitative research methodologies Data management Ethical decision-making		Designing problem solving proposal, critical literature review or research proposal related to oral disease prevention and health promotion Team building and leadership		Integrating course knowledge into practical field experience  Team building and leadership  Self-Evaluation		Analyzing field data  Report writing  Team building and leadership	
<b>Course assessment</b>	Dental hygiene curriculum design project, portfolio of course projects and seminar assignments		Written exam on course content; portfolio of course projects and seminar assignments		Assignments to integrate and apply course knowledge to field work		Portfolio of course projects and seminar assignments Reflection	
<b>Program assessment</b>	Draft framework of a written scholarly field project proposal related to the capstone project		Oral Qualifying Exam: field project proposal		Field Project implementation		Comprehensive exam: Written and oral report of Field Project outcomes and potential applications	

\* Adapted from Table 3 Proposal for MS Degree in Global Health Sciences, April 2007

### **2.3.2. Specific Fields of Emphasis**

There will be no formal content tracks as part of the MS degree since all students will engage in the same curriculum. Within the Dental Hygiene Science Seminar (DH 200 A, B, and C) students will have the opportunity to focus on particular topics based on areas of interest and course emphasis. Potential areas of emphasis include

- Theories and conceptual frameworks that relate to solving a particular dental hygiene problem and related program development

- Cultural, social, and political determinants of oral health and health disparities

- Oral health policies and their impact on access to oral healthcare and on dental hygiene research, education, and practice

- Efficacy and effectiveness of oral disease prevention and health promotion programs

The seminar coordinator of the Dental Hygiene Science Seminar series will recruit faculty from the interdisciplinary faculty associated with the MSDH program and MSDH students to develop content and conduct the seminars based on the interests of the students. The MS Program Director will work closely with seminar leaders to assure that content and goals for each seminar map to the core competencies of the overall degree program.

### **2.4. Oral Qualifying Examination**

At the end of the Fall quarter of their MS program, students will present to a committee of three faculty an oral report of their field work proposal that identifies a significant dental hygiene problem and applies advanced clinical and theoretical knowledge related to oral disease prevention and health promotion as it relates to that area. The proposal will include a plan to conduct a needs assessment; a clear statement of the problem and environmental context and related dental hygiene roles and relationships; the problem supported by a critique of current literature, the conceptual and theoretical framework guiding the project, and the proposed methodology for project implementation including the plan for implementation, budget and evaluation procedures. A committee of three faculty will assess the oral qualifying exam. The committee will be composed of the student's mentor, one of the course faculty (appointed by the Program Director) and one at-large faculty member from the faculty associated with the MS program. Each student will submit a list of three to five potential faculty to fill this slot, and the Program Director will select one. In this way, faculty members will not be overused and there will be a conscious effort to assure interdisciplinary capacity by committee members. After the faculty committee determines the student has passed the qualifying examination, students will file for advancement to candidacy with the Graduate Division.

### **2.5. Field Work**

Students are required to develop a scholarly project, including one quarter of mentored field work (DH 203, four units) in one of the following four types of settings related to the student's area of interest: (1) a basic preparation dental hygiene program or the UCSF predoctoral dental educational program; (2) a public health or governmental setting; (3) an established research or administrative group within UCSF; or (4) an oral health-

related industry setting. Students will be based within a partner institution or setting to complete the project developed over the previous two quarters within an existing collaborative project as part of their requirements for the MS degree. They will present the results of this project in their last quarter as part of the comprehensive examination. Identification of the project and field work will be encouraged in the first part of the program with the help of their mentor. The UCSF mentor (a member of the Graduate Group) and the Program Director will oversee the field work and, along with the student, will develop specific competencies to be achieved in the field work. These will be recorded by students in their learning portfolio for later assessment. Field mentorship will be an integral part of the field experience and will be designed so that the students' time in the field benefits not only the student but also the local site.

**2.6. Thesis:** None required

## **2.7. Comprehensive Examination**

The purpose of the comprehensive examination (i.e., Capstone Project) is to evaluate the student's ability to apply advanced clinical and theoretical knowledge related to oral disease prevention and health promotion in a selected area of interest and to critique research as it relates to that area. There will be two components to the Comprehensive Examination:

1. A written scholarly project report of the field project. Upon returning from their field experience and the implementation of the scholarly field project proposal, each student will produce a written project report related to his/her field work in the form of one of the following options selected by the student: a Problem Solving Proposal, a Critical Literature Review, or a Research Proposal.<sup>28</sup> (See Appendix D for areas to be addressed and evaluation criteria.)

The written scholarly report will be no more than 25 pages and will include a thorough literature review, the needs assessment, a clear statement of the problem, environmental context and related dental hygiene roles and relationships; methodology, results, discussion and implications and potential applications of the field project. This paper could serve as the basis for a grant application for further detailed research or as an article for publication, depending on the nature of the field project.

2. An oral presentation. Concurrent with the written report, students will complete an oral presentation of approximately 30 minutes length regarding their project in the last quarter. The student will participate in the comprehensive examination only after the fulfillment of all requirements for the MSDH degree, or during the quarter within which those requirements will be fulfilled. In addition, the student must advance to candidacy prior to taking the examination. A student who has failed the comprehensive examination may retake it *only once* and no earlier than the quarter following the initial exam. Based on availability and appropriateness, faculty members of the MSDH program, whether salaried or non-salaried, will be designated to read the comprehensive examination and evaluate it based on specific areas to be addressed and evaluation criteria for each (see Appendix D).

### **2.7.1. Explanation of Special Requirements**

There are no special requirements.

## **2.8. Relationship of Master's and Doctor's Programs**

Currently, the Master of Science is the highest degree offered in Dental Hygiene. The MSDH will allow individuals to pursue advanced study at the doctoral level in related fields such as education, health psychology, or gerontology. After the proposed MS is established, a doctoral program in Dental Hygiene Science will follow with a focus on dental hygiene research to solve oral disease prevention and health promotion problems.

## **2.9. Special Preparation for Careers in Teaching**

An aim of the proposed program is to prepare MS dental hygiene graduates for careers in teaching and the proposed course DH 201, Curriculum Development and Methods of Instruction (3 units) focuses on achieving this aim.

## **2.10. Normative Time from Matriculation to Degree**

The normative time for a MSDH student is 1 year. The MSDH program has developed a policy for monitoring progress of M.S. student using a formal Academic Review Form (See Appendix E)

## **SECTION 3: PROJECTED NEED**

### **3.1 Student Demand for Program**

A survey of UCSF dental hygiene graduates was conducted in 2002. The population sampled was 746 graduates with known addresses from the 1960 to 2000 graduating classes. Responses were received from 468 graduates, for a response rate of 66%. Fifty-one percent responded "very favorable" and 30% "favorable" with regard to the establishment of a Master's Degree in Dental Hygiene at UCSF. Twenty-five percent of the overall respondents and 53% (n=62) of the graduates of the most recent decade indicated that they would be interested in enrolling in such a program.<sup>29</sup>

Currently, dental hygiene directors of educational programs are required to have at least a Masters Degree. Within the state of California, there are 23 basic preparation dental hygiene educational programs, including the bachelor's programs in Dental Hygiene at the University of the Pacific, the University of Southern California, and Loma Linda University. However, there are no masters degree programs in Dental Hygiene in California to prepare Dental Hygiene faculty. The proposed MSDH program will help address the need for dental hygiene faculty not only in California and the western region, but also throughout the U.S. and the world.

### **3.2 Opportunities for Placement of Graduates**

The need for qualified dental hygiene educators is evident by the appearance of large numbers of classified ads in major professional journals recruiting dental hygienists who

have a background in dental hygiene, research and educational theory. We have included a sampling of ads that have appeared in the *Journal of Dental Education*, the *Journal of Dental Hygiene*, and ADHA's *Access* publication in 2005-2007 (Appendix F).

### **3.3 Importance of the Master of Science Degree Program to the Discipline**

Developing solutions to major problems of oral disease prevention and health promotion is central to the discipline of Dental Hygiene. Advancement of the discipline requires that dental hygiene scholars receive specialized training and a broad-based interdisciplinary perspective. To solve problems related to dental hygiene science, an understanding of research methods and design as well as development of the skills of critical thinking, strategic planning, and oral and written communication are needed. The proposed Masters Degree in Dental Hygiene will provide interdisciplinary training to help dental hygiene scholars understand both the technical and social context in which the answers to dental hygiene research questions can be approached. In so doing, it will prepare dental hygiene scholars to assume leadership roles in Dental Hygiene and for various careers in academia, research, industry, and community health settings.

### **3.4 Ways in Which the Program Will Meet the Needs of Society**

The proposed MSDH program is responsive to the documented current and projected future shortage of dental hygiene educators to meet the demand for clinical dental hygienists to provide needed dental hygiene care

Moreover, program graduates will be in a position to help solve pressing problems in society related to oral disease prevention and health promotion across the life span.

### **3.5 Relationship of the Program to Research and/or Professional Interests of the Faculty**

The biosketches of faculty with a stated interest in participating in the MSDH Program are in Appendix I. The faculty members are health science researchers and distinguished teachers whose research and professional interests span a variety of disciplines including dental hygiene, oral disease prevention and health promotion, cariology, gerontology, periodontology, dental public health, oral medicine, biomaterials and engineering, nursing, health policy.

### **3.6 Program Differentiation**

The proposed program is unique among University of California institutions and thus will not compete with any existing programs. The current M.S. in Oral Craniofacial Sciences is geared primarily towards dentists enrolled in specialty programs. In the last 10 years only one dental hygienist enrolled in that program.

## **SECTION 4: FACULTY**

**(WFWM = WILLING FIELDWORK MENTOR; L = LECTURER; SL= SEMINAR LEADER; CD COURSE DIRECTOR;  
MSDHPD= MSDH PROGRAM DIRECTOR)**

NAME	RANK	SCHOOL	HIGHEST DEGREE	EXPERTISE	ROLE
GARY ARMITAGE	PROFESSOR	DENTISTRY	DDS/MS	PERIODONTOLOGY	L: DH 202 WFWM: DH203
WILLIAM BIRD	HEALTH SCI CLINICAL PROFESSOR	DENTISTRY	DDS/DRPH	DENTAL PUBLIC HEALTH	L: DH200 SL: DH 200 WFWM: DH 203
SHEILA BREAR	HEALTH SCI ASSISTANT CLINICAL PROFESSOR	DENTISTRY	BDS	GENERAL DENTISTRY	WFWM: DH 203
WARREN S. EAKLE	PROFESSOR OF CLINICAL DENTISTRY	DENTISTRY	DDS	GENERAL DENTISTRY	WFWM: DH 203 L: DH202
GWEN ESSEX	ASSOCIATE CLINICAL PROFESSOR	DENTISTRY	RDH, MS	DENTAL HYGIENE	WFWM: DH203 SL: DH 200 L: DH 201
JOHN FEATHERSTONE	PROFESSOR	DENTISTRY	PHD	CARIES RISK ASSESSMENT AND MANAGEMENT	WFWM: DH 203 L: DH 202
FREDRIC C. FINZEN	HEALTH SCIENCE CLINICAL PROFESSOR	DENTISTRY	DDS	PROSTHODONTICS	WFWM: DH 203
DANIEL FRIED	PROFESSOR	DENTISTRY	PHD	BIOMATERIALS AND BIOENGINEERING	WFWM: DH 203
STUART GANSKY	ASSOCIATE PROFESSOR	DENTISTRY	DRPH	BIostatISTICS	L & SL: DPH 210 WFWM: DH 203
BARBARA GERBERT	PROFESSOR	DENTISTRY	PHD	BEHAVIORAL SCIENCE	WFWM: DH 203 L: DH 200

BARBARA HECKMAN	ASSOCIATE CLINICAL PROFESSOR	DENTISTRY	RDH, MS	DENTAL HYGIENE	WFWM: DH 203 SL: DH 200, DH 201. DH202 , SL: N 295A L: DH 201
SUSAN HYDE	ASSISTANT ADJUNCT PROFESSOR	DENTISTRY	DDS, MPH, PHD	GERIATRIC DENTISTRY	L: DH 202 WFWM: DH 203
PETER LOOMER	ASSOCIATE PROFESSOR	DENTISTRY	DDS, PHD	PERIODONTICS	WFWM: DH 203 L: DH 202
ELIZABETH MACERA	ASSOCIATE CLINICAL PROFESSOR	NURSING	RN,PHD	HEALTH & AGING	CD: N295 A WFWM: DH 203
LYNDA MACKIN	ASSOCIATE CLINICAL PROFESSOR	NURSING	RN, MS	HEALTH & AGING	WFWM: DH 203 L: DH 202
GRAYSON MARSHALL	PROFESSOR	DENTISTRY	DDS, MPH	BIOMATERIALS AND BIOENGINEERING	WFWM: DH 203
HOWARD POLLICK	HEALTH SCIENCE CLINICAL PROFESSOR	DENTISTRY	BDS, MPH	DENTAL PUBLIC HEALTH	WFWM: DH 203 CD: DPHH 200
MARK RYDER	PROFESSOR	DENTISTRY	DMD, MS	PERIODONTICS	WFWM: DH 203 L: DH 202
STEVEN SILVERSTEIN	PROFESSOR	DENTISTRY	DDS, MPH	DENTAL PUBLIC HEALTH	WFWM: DH 203 L: DH 200
NORMA SOLARZ	ASSISTANT CLINICAL PROFESSOR	DENTISTRY	DDS, MPH	DENTAL PUBLIC HEALTH	WFWM: DH 203 L: DH 200
SAMANTHA STEPHEN	ASSISTANT CLINICAL PROFESSOR	DENTISTRY (DIRECTOR OF DENTAL SERVICES, DEPT OF PUBLIC HEALTH,S.F.)	RDH, MPH	DENTAL PUBLIC HEALTH/DENTAL HYGIENE	WFWM: DH 203 L: DH 200
MARGARET WALLHAGEN	PROFESSOR	NURSING	PHD, APRN, BC, GNP, AGSF	GERIATRIC & PHYSIOLOGICAL NURSING	WFWM: DH 203
MARGARET WALSH	PROFESSOR	DENTISTRY	RDH, MA, MS, EDD	DENTAL HYGIENE	MSDHPD WFWM: DH 203 CD: DH 200 CD: DH201 CD: DH 202 CD: DH 203 SL: N 295 A

JANE WEINTRAUB	PROFESSOR	DENTISTRY	DDS, MPH	ORAL EPIDEMIOLOGY/DENTAL PUBLIC HEALTH	CD: DPH 210 L: DH 200 WFWM: DH 203
JOEL M. WHITE	PROFESSOR	DENTISTRY	DDS, MS	CLINICAL RESEARCH/GENERAL DENTISTRY	WFWM: DH 203
JOAN WOOD	PROFESSOR	ACADEMIC GERIATRIC RESEARCH CENTER	PHD	GERIATRICS/SOCIAL AND BEHAVIORAL SCIENCES	WFWM: DH 203
JUDY YAMAMOTO	ASSOCIATE CLINICAL PROFESSOR	DENTISTRY	RDH, MS	DENTAL HYGIENE	WFWM: DH 203 L: DH 201; SL: DH 200; DH 202

## SECTION 5: COURSES

### 5.1 Description of Proposed New Courses

Each entry below contains a course description suitable for entry into the university course catalogue under the proposed Dental Hygiene Sciences heading (DH designation subject to approval of the Committee on Courses), plus an entry of core knowledge and competencies to be gained from each course. Appendix I contains draft Course Forms for each proposed course. The overall pedagogical approach of the MS in Dental Hygiene program will be that of case-based learning, using presentation of actual cases, research papers, or appropriate problem scenarios for critical analysis and discussion directly related to the content of the course.

#### 5.1.1. DH 200 A, B, C Dental Hygiene Science Seminar

Critical analyses of contemporary theories and conceptual frameworks of dental hygiene science as they relate to dental hygiene roles in oral disease prevention and health promotion and dental hygiene schools of thought. Emphasis will be on case-based learning about problems of interest to the students. Each quarterly section will have individual content developed by the Seminar Coordinator and the students collaboratively to assure that the specific needs of students in the program competencies are met. It is in the seminars that the written scholarly project proposal will be developed during Summer and Fall quarters in preparation for the oral qualifying examination at the end of the Fall quarter. The major evaluation tool will be through the self-assessment learning Portfolio which will be reviewed by the student, the student's mentor, and the Seminar Coordinator at least once per quarter. A formal evaluation will be required at the completion of the Fall and Winter quarters.

##### 5.1.1.1. Course Credit

- 3 units per Summer, Fall, and Spring quarters for a total of 9 units
- 2 hours in-class per week per quarter
- 3 hours of seminar per week per quarter

##### 5.1.1.2. Course Objectives

**Summer Quarter:** Upon completion of this course students will be able to:

- Understand the application of Dental Hygiene's paradigm concepts of Dental Hygiene Actions, Health/Oral Health, the Environment, and the Client, to dental hygiene research, education, and practice
- Understand the social, cultural, political, educational, economic, and environmental determinants of health/oral health and their effect on health disparities
- Cite examples of groups with oral health disparities
- Explain at least one oral disease prevention or health promotion theory and apply that theory to a dental hygiene problem
- Cite types of quantitative and qualitative tools used to measure outcomes of health promotion and disease prevention research and select a tool for use to solve a dental hygiene problem
- Describe the principles and evaluation criteria for community participatory research
- Review the evidence of effectiveness of brief health promotion interventions that involve healthcare professionals in areas such as smoking cessation, nutritional counseling, oral cancer screening, and blood pressure monitoring,
- Incorporate related evidence from clinical research in oral health and disease, dental public health, behavioral and social sciences, and health policy information to study a selected dental hygiene problem
- Incorporate material from the content of courses into development of a draft framework of a written scholarly field project proposal

**Fall Quarter:** Upon completion of this course students will:

- Incorporate material from the content of courses into development of a final written field project proposal
- Complete the Oral Qualifying Exam to gain approval of their field project proposal for implementation in the Winter Quarter

**Spring Quarter:** Upon completion of this course students will be able to:

- Complete as the Capstone Project an oral and written scholarly report of the Field Project's outcomes and potential applications.
- Demonstrate proficiency in oral communication when delivering professional presentations related to the Field Project.
- Describe job access points in dental hygiene in a variety of different settings.

### **5.1.2. DH 201, Dental Hygiene Curriculum Development and Methods of Instruction**

Critical appraisal of various theories and schools of thought in dental hygiene that drive curriculum development in basic preparation dental hygiene educational programs. In case presentations of dental hygiene curriculae, students will critically evaluate the fit of program philosophy, conceptual framework, goals, outcomes, learning methods, assessments, and competencies that drive curriculum design. In addition, ADA accreditation standards for dental hygiene educational programs will be reviewed and analyzed. Students will apply these principles of curriculum development in small groups to develop overall program goals, outcomes, learning methods, assessments, and competencies for a model basic preparation dental hygiene program.

In addition, students will critically evaluate theories of the teaching-learning process and their application to dental hygiene education, staff development, client education, and educational

programs for other health professionals as part of an integrated multidisciplinary approach to education. Cases describing specific teaching learning scenarios will be evaluated by students to determine related competencies, teaching strategies and assessment and evaluation of competency achievement. Measurement tools for use in evaluating various aspects of laboratory and clinical dental hygiene education also will be analyzed.

#### **5.1.2.1. Course Credit**

- 3 units
- 2 hours in-class per week
- 3 hours seminar per week

#### **5.1.2.2. Course Objectives**

Upon completion of this course students will be able to:

- Develop a basic preparation dental hygiene program model that is based on a selected school of thought regarding Dental Hygiene Paradigm Concepts and map program goals, outcomes, learning methods, assessments, and competencies.
- Understand ADA accreditation standards for basic preparation dental hygiene programs
- Understand the application of theories of the teaching-learning process in various educational settings.
- Demonstrate proficiency in oral communication skills
- Understand concepts underlying testing, measurement, reliability and validity.

#### **5.1.3. DH 202, Dental Hygiene Oral Disease Prevention and Management by Risk Assessment**

Course provides the theoretical basis for associations between oral infections and systemic disease; a comprehensive foundation for a team approach to the prevention and management of oral health problems by risk assessment; and the role of dental hygiene actions. In addition, literature on methods employed for dissemination of evidence-based strategies to healthcare professionals and the public are reviewed. In seminar groups, students will design team-based approaches to oral disease prevention and management by risk assessment across the lifespan, identify barriers to the adoption of emerging science by dental hygienists to reduce risk in susceptible patients, and explore potential dental hygiene strategies to improve clinical decision-making across professions and healthcare settings.

#### **5.1.3.1. Course Credit**

- 4 units over the course of one quarter
- 3 hours of lecture per week
- 3 hours of seminar per week

#### **5.1.3.2. Course Objectives**

Upon completion of this course students will be able to:

- Understand the biologic basis for the interdependence of oral inflammation and infections with systemic health
- Understand the relationship of oral health to overall health, especially with regard to potential associations between periodontal infections and the following adverse systemic outcomes:
  - ♣ Heart diseases (infective endocarditis, atherosclerosis, and coronary heart disease)
  - ♣ Diabetes Mellitus (onset and control)
  - ♣ Pulmonary disease (aspiration and ventilator-associated pneumonia; chronic obstructive pulmonary disease)
  - ♣ Adverse pregnancy outcomes (preterm birth; preeclampsia; fetal growth restriction)
  - ♣ Arthritis and failure of artificial joints
  - ♣ Cancer (pancreatic cancer; lung cancer; and stomach cancer)
  - ♣ Neurological diseases (cerebrovascular disease: nonhemorrhagic stroke; brain abscess; Alzheimer's disease; and meningitis)\_
  - ♣ Gastrointestinal diseases (gastric ulcers; stomach cancer)
- Evaluate examples of effective dental hygiene health promotion interventions to enhance the public's understanding of the beneficial effects of regular oral self-care and regular dental hygiene care on systemic health
- Cite examples of effective community-based interventions on the oral health and systemic health connection and evaluate them from a biological, cultural, and educational vantage.
- Appreciate the importance of achieving a balance between pathologic factors and preventive factors in caries prevention and management interventions
- Understand the principles of strategies for caries management related to the tooth, diet, acid, saliva, bacteria, client education (which includes the individual, family, and communities)
- Know the differences for anticipatory guidance and management of caries by risk assessment for the following groups:
  - ♣ Adults: Low, moderate, high, and extreme caries risk categories
  - ♣ Pregnant women: Low, moderate, high, and extreme caries risk categories
  - ♣ Children 0 to 5 years of age
  - ♣ Children 6 to 18 years of age
  - ♣ Older adults
- Integrate the following information obtained from case-based presentations to determine whether an individual is in low-, moderate-, high- or extreme caries risk category :
  - ♣ Careful dental and general health history including fluoride exposure and medications taken
  - ♣ Clinical exam noting signs of existing caries and past caries experience
  - ♣ Diet analysis to determine number and duration of acid challenges per day
  - ♣ Salivary flow rate if patient complains of dryness or appears to have a low flow rate.
- Integrate information obtained from case-based presentations to explain how smoking, poor oral hygiene, genotype-positive status, and diabetes mellitus modulated periodontal disease susceptibility and influenced its the onset, progression, and severity.

- Review the dental hygiene literature and critically appraise dental hygiene health promotion strategies to communicate the relationship of risk factors for oral disease to individual clients, other health professions, and the public at large.
- Design dental hygiene strategies for communication of oral assessment findings to clients (i.e., individual, family, community) so they have an understanding of their current oral disease status and potential risk for future oral disease based on their degree of risk
- Discuss theories of aging
- Describe the significant demographic characteristics of the population older than age 64
- Describe normal age-related changes of the cardiovascular, pulmonary, musculoskeletal, neurosensory, gastrointestinal, genitourinary, and integumentary systems.
- Describe demographic, social, and physiologic aspects of aging
- Describe prevalent chronic diseases associated with aging and discuss the implications for oral health care
- Identify age-related oral changes commonly found in the older adult
- Discuss oral changes that occur as a result of diseases or medications
- Explain potential alterations in the dental hygiene process of care that need to be considered when treating an older adult
- Explain health promotion strategies based on older adults' needs

#### **5.1.4. DH 203 Dental Hygiene Field Work (Prerequisite: Advancement to Candidacy)**

Students will enroll in this course while completing their mentioned field project in one of the following four settings: an educational setting such as a basic preparation dental hygiene program or in the UCSF predoctoral dental program; a public health or governmental setting; an established research or administrative group at UCSF related to the student's area of interest; or an oral health-related industry setting. Students will be based within a partner institution to complete the project developed over the previous two quarters within an existing collaborative project. Students will be responsible for continually assessing their own progress and discussing with their mentors their own work and the application of their didactic learning to their particular setting. They will spend at least two months in the field work setting.

##### **5.1.4.1. Course Credit**

- Four units over the course of one quarter
- Minimum 120 hours independent field work

##### **5.1.4.2. Course Objectives**

Upon completion of this course students will be able to:

- Complete an independent mentored project of their own design in a dental hygiene or related setting
- Demonstrate the knowledge, behaviors and attitudes listed in Table 2 as applied to field work
- Assess their role in the field work setting and determine potential career opportunities based on this role

## **5.2. Description of Existing Core Courses for the Proposed MS Degree**

### **5.2.1. DPH 210. Introduction to Research Methods and Design (2 units)**

The purpose of this course is to introduce participants to the research process with emphasis on different types of research methods and designs frequently used to study oral health. (S/D Department: PRDS).

### **5.2.2. DPHH 200. Ethical and Behavioral Considerations in Clinical and Research Aspects of Dentistry (2 units)**

Using lectures and group discussions, this course will seek to increase student awareness of: a) Behavioral issues affecting the delivery of oral health services, b) ethical issues affecting dental practice and research, and c) the impact of both these subjects on decision-making in clinical practice and research. (S/D Department: PRDS)

### **5.2.3. Nursing 295A. Care of Older Adults (3 units)**

Course focuses on advanced practice nursing care of older clients across care settings using case studies, lectures, and discussions. Integrates pathophysiological, pharmacological, psychosocial, and ethical concepts. Critically analyzes evidence-based approaches to assessment and care.

### **5.2.4. Social and Behavioral Sciences 211A. Basic Topics in Leadership in Health Care Systems (2 units)**

Course examines basic topics in leadership in health care systems including management, human resources, financing and budgeting, and feedback and coaching. (SON: SOC BEH SC)

### **5.2.5. Social and Behavioral Sciences 211B. Managing Change in Health Care Systems (2 units)**

Course examines the principles of organization change in health care systems. These include strategy, decision making and conflict management, communications, and quality improvement and management. (SON: SOC BEH SC)

### **5.2.6. Social and Behavioral Sciences 211C. Leadership Development & Self-Renewal (2 units)**

Course examines the principles of leadership and self-renewal including negotiating, motivating others, problem solving, managing diversity, improving care management, and developing skills and knowledge. (SON: SOC BEH SC)

### **5.2.7. Social and Behavioral Sciences 222. Health Care Economics and Policy (3 units)**

Course provides a critical analysis of economic, sociological, and political factors that affect health care. Examines U.S. health policies that impact on access, quality, costs, delivery systems, professional practices, and reform. (SON: SOC BEH SC)

## **SECTION 6: RESOURCE REQUIREMENTS**

Program administration will be supported by the Department of PRDS and by funds from various sources, such as the American Dental Hygienists' Association Foundation, the California Dental Association Foundation and private industry (e.g. Oral B Laboratories, Proctor and Gamble).

### **6.1 FTE Faculty**

We anticipate no additional costs for FTE faculty for the *2 MSDH students per year as proposed by the prior administration*. (The program could realistically support 6-8 students per year.) The faculty membership is drawn from existing FTE. One FTE is dedicated to the program by the Department of PRDS. This individual will direct the M.S. program and have primary responsibility for coordinating faculty guest lecturers in, and supervision of the 200 level Dental Hygiene courses. We anticipate the addition of one 50% time Dental Hygiene faculty member funded by student fees. Other participating faculty have appointments in the PRDS Department and in other departments and schools on the UCSF campus. These faculty either teach currently existing courses that are being proposed for inclusion in the MSDH curriculum, or they have agreed to serve as teaching and/or research mentors as appropriate to student-faculty interests and schedules.

As the MSDH program becomes established, we anticipate this program will contribute to growth of the number of graduate students on the UCSF campus and in the S/D. Extramural funding from foundations, private industry and professional organizations will be sought to provide support to supplement student fees.

### **6.2 Library acquisition**

There will be modest additional costs incurred by the establishment of this new graduate program since the required textbooks for this discipline will have to be acquired. Most Dental Hygiene journals are on-line. The increased use of the digital library, however, makes the incremental costs of adding more users so low as to be insignificant.

### **6.3 Computing Costs**

Students will be required to have their own laptop computers. We do not think that the new program will negatively impact the computing costs.

### **6.4 Equipment**

We anticipate no additional costs for equipment. Equipment costs are borne by the individual research laboratories/groups with whom students preceptor. Thus, the additional students should not negatively impact expenses for equipment.

### **6.5 Space and Other Capital Facilities**

No new space is required for the 4 students initially proposed for the program. It is anticipated that research space in the laboratories of the Faculty Research Mentors will be available to support the student's collaborative research preceptorship.

### **6.6 Other Operating Costs**

The costs for running the proposed program will include 1.0 administrative staff to handle the administrative portion of recruiting students, administering the program, and maintaining the

records. This support will be provided by the Preventive and Restorative Dental Sciences' departmental budget through a proportion of the student tuition allocation.

### **6.7 Multiple Sites for Teaching**

Because the MSDH program is a multidisciplinary graduate program, students will be located at UCSF campus sites including Parnassus Heights and Laurel Heights and at basic preparation dental hygiene educational programs in California.

## **Section 7. Graduate student support**

### **7.1 Support Policy**

Students are primarily responsible for funding their own student fees and expenses.

### **7.2 Sources of Support**

Research grant support via the Faculty Research Mentors might contribute to support of graduate students working on funded research grants. Students admitted to this program also can apply for financial aid. Federal and private loans are also available. For example, the American Dental Hygienists Association offers scholarship funding for graduate dental hygiene students.

## **Section 8. Changes in Senate regulations**

No changes in Senate Regulations at the Divisional level or in the Academic Assembly will be required if this proposals for an M.S. degree in Dental Hygiene is approved

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<sup>1</sup> HRSA Professional practice environment, 2004.

<sup>2</sup> US Department of Health and Human Services. Oral Health in America: A Report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2000.

<sup>3</sup> ADEA. Unleashing the potential, 2006.

<sup>4</sup> U.S. Department of Health and Human Services. Surgeon General's Report: A Call to Action. Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2003.

<sup>5</sup> Oral Health Coalition report in California.

<sup>6</sup> Haden NK, Morr KE, Valachovic RW. Trends in allied dental education: An analysis of the past and a look to the future. *Journal of Dental Education*. 2001;65:480-495.

<sup>7</sup> American Association of Dental Schools, Standing Committee of Dental Hygiene Directors. Report of the Task Force on Dental Hygiene Education, 1988-1992. Washington, DC: American Association of Dental Schools, 1992.

<sup>8</sup> University-wide Health Sciences Committee. *University of California Health Sciences Education Workforce Needs and Enrollment Planning*. Office of Health Affairs. University of California, April 2005: pp. 1-48.

<sup>9</sup> U.S. Bureau of Labor Statistics, US Department of Labor. Occupational outlook handbook, 2004 ed., dental hygienists. At: [www.bls.gov/oco/ocos097.htm](http://www.bls.gov/oco/ocos097.htm). Accessed: September 4, 2006.

<sup>10</sup> Bureau of Labor Statistics, US Department of Labor. Occupational outlook handbook, 2002-03 ed., dental assistants. At: [www.bls.gov/oco/ocos163.htm](http://www.bls.gov/oco/ocos163.htm). Accessed: September 4, 2006.

<sup>11</sup> Nunn et al. The current status of allied dental faculty: a survey report. *Journal of Dental Education*. March 2004;329-340.

<sup>12</sup> Darby M, Walsh M. The Dental Hygiene Profession. In *Dental Hygiene Theory and Practice*. Second Edition, Saunders, Philadelphia, PA, 2003.

<sup>13</sup> American Dental Hygienists' Association. Proceedings of the 68<sup>th</sup> Annual Session, House of Delegates. Louisville, KY: June, 1992, and 69<sup>th</sup> Annual Session, House of Delegates, CO, June, 1993.

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<sup>15</sup> Johnson PM. Theory development in Dental Hygiene. *Journal of the Canadian Dental Hygienists' Association*. 1991;25(1):10-21.

<sup>16</sup> Darby M, Walsh M. A human needs conceptual model for Dental Hygiene: Part I. *J Dental Hygiene*. 1993;67(6):326-334.

<sup>17</sup> Walsh M, Darby M. Application of the human needs conceptual model to the role of the clinician: Part II. *J Dental Hygiene*. 1993;67(6):335-346.

<sup>18</sup> Darby M, Walsh M. A human needs approach to dental hygiene care. *Dental Hygienist News*. 1998;11(1):2-7.

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- <sup>19</sup> Darby M, Walsh M. Application of the Human Needs Conceptual Model to Dental Hygiene Practice. *J Dental Hygiene*. 2000;74(Issue III Summer):230-237.
- <sup>20</sup> Williams K et al. Oral health-related quality of life: A model for Dental Hygiene. *J Dental Hygiene* 1998;72(2):
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- <sup>22</sup> American Dental Hygienists' Association. *Dental Hygiene Education and Practice Workshop I Proceedings*. Chicago: American Dental Hygienists' Association, 1984.
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