Dear UCSF School of Dentistry Faculty,

This page is intended as an introduction to the curriculum planning process in the school of Dentistry at UCSF and to provide faculty and students with some detail about the curriculum planning process and about the proposed new curriculum. This material has been disseminated at meetings held during the 1998-99 academic year of the Educational Policy Committee (EPC, 6 meetings) and its subcommittees, the Basic Sciences Coordinating Committee (BSCC, 2 meetings) and the Clinical Sciences Coordinating Committee (CSCC, one meeting). This material was also distributed to the Faculty Council at their meeting of July 1, 1999. At this meeting the departmental representatives on Faculty Council were encouraged to photocopy and disseminate it to their departmental colleagues for review and discussion.

The purpose of disseminating this information is to give faculty an opportunity to review the proposed changes in the curriculum and to inform themselves about the details of the plan before they indicate their level of enthusiasm for the plan. Faculty are also encouraged to provide feedback to the Curriculum Planning Committee, either directly or via their Faculty Council representative. The members of the Curriculum Planning Committee are listed at the bottom of this page, along with their e-mail addresses. The Faculty Council is planning to review the curriculum plan at its meeting of August 19, 1999. The entire faculty is scheduled to consider the plan at its October retreat, to be held on October 16, 1999, at the Laurel Heights Conference Center.

For those of you interested in reviewing the School of Medicine's similar plans for revising their curriculum, it can be accessed on the web at the following address:
http://www.som.ucsf.edu/education/oca/newcurric/.

Below you will find a set of links to documents that discuss the curriculum review process and the proposed changes to the curriculum.

The Curriculum Planning Committee
Curriculum Planning in the 1990s at the School of Dentistry

Recent History and Planning Process (1996-99)

The Plan

Goals

Resource Implications

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**Biomedical Sciences Stream**

(subcommittee chaired by Peter B. Sargent)

The principal challenge in planning for Biomedical Sciences Stream was to generate an Organ Systems and Human Pathophysiology course. This was done by taking elements from many existing courses, especially Physiology, Pharmacology, General Pathology, and Oral Pathology. As currently envisaged, this course would be taught over three quarters: the Spring quarter of year I and the Fall and Winter quarters of year II. It would be taken by both Dental and Dental Hygiene students. See the links below to learn more about this proposed new course as well as about other, less radical proposals for changes in the Biomedical Sciences curriculum.

Table of Existing and Proposed Courses

Fate of Existing Courses

Description of New Courses

Example of a block of material in the Human Pathophysiology course

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**Dental Sciences Stream**

(subcommittee chaired by Mark I. Ryder)

Introduction and brief course descriptions

Planned Courses
The curriculum planning within the Patient-Centered Care Stream has been closely tied to the Accreditation process, which has resulted in increased attention on competencies and their assessment. As a result of this focus, the subcommittee has taken a broad view of the entire four year curriculum and has organized 42 defined competencies we expect of our dental graduates into six domains, which are

- Professionalism
- Patient Assessment
- Behavioral Science
- Disease Prevention & Management
- Restoration of Form & Function
- Comprehensive Dental Care.

For each competency the planning committee has considered when the material should be introduced and when competency should be measured. A table with all 42 competencies, and the "introduced" and "measured" times indicated, can be accessed by clicking on the link below.

[Domains and Competencies](#), with calendar for Time Introduced and Time Competency Assessed

Note that this link has four tables in series: one for each year of the dental curriculum.
Detailed planning for some of the domains is now complete. Below are the detailed lay-outs for the Professionalism domain (#1) and the Patient Assessment Domain (#2).

**Professionalism Competencies**

**Patient Assessment Competencies**

You will see that these tables have much more information in them than the first table, [Domains and Competencies](#). These tables indicate not only the time when material is introduced into the curriculum relevant to a competency and when that competency is assessed, but also criteria for assessment of competency and how competency is measured. Tables such as these will be used to follow progress of each class of students and of each individual student.

As an example of how these tables can be used to follow student progress, see the link below, which is to a competency #9 (Diagnosis & management of space management problems) within Domain #4 (Disease Prevention & Management).

[Domain #4, Disease Prevention & Management, Competency 4.9, Diagnosis & management of space management problems](#)

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**Foundations of Restorative Science & Technology Stream**

(Planning subcommittee chaired by Gordon Douglass)

[Description of the course work for the Foundations of Restorative Science & Technology Stream](#)

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**Scientific Method & Clinical Dentistry Stream**

(Planning subcommittee chaired by Hilary Pritchard)

[Description of the course work for the Scientific Method and Clinical Dentistry Stream](#)

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**Vertical Integration**
One of the challenges faced by the Curriculum Planning Committee is to integrate the curriculum vertically. There should be a congruity in what the students are exposed to each week. In some instances we have attempted to "line up" material in different courses that is thematically integrated (e.g., having the students learn about the histology and the gross anatomy of organ systems in parallel in two separate courses. But the vertical integration effort involves detailed planning, and we have left much of this for a time when all the individuals who play a role in this process are in place (see memo about Resources). The final version of the curriculum should have a balanced slate of courses each quarter (no more than 4-6, according to the original goal) and should have, at least in the first two years, no more than 30-32 hours of formal instruction per week. Here (below) is a table of where we are for year 1. You can see that the number of hours fluctuates a bit and is as high as 39 per week for a while. This will need to be corrected in subsequent stages of the planning process.

| Hours of Instruction - Year 1 |

What happens now?

Look this material over. You will see that it is a "work in progress." The curriculum planning committee has worked for nearly three years to bring the planning process to the point where it is now, in the Summer of 1999. To complete this process, we need additional resources, as outlined above. But to obtain these resources, we need the enthusiastic participation of the School's administration, and in order for them to acquire these resources, they need to know the level of enthusiasm that we, the faculty, have for this framework. Now is the time to discuss these plans among yourselves and give feedback to your Faculty Council representatives and to the Curriculum Planning Committee (see below). Together we can make a significant difference in the quality of the educational experience at the School, in the quality of our students' experience while they are here at UCSF (and, by extension, their attitude about UCSF after they leave) and in the quality of the dental professionals we graduate.

The Curriculum Planning Committee

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HISTORY OF CURRICULUM PLANNING
(1990’s)
(a selected set of recommendations by committees that have considered reforms in the
dental curriculum)
Faculty Council (7/1/99)


● The scientific method should be further emphasized in clinical instruction.


● The curriculum should be re-organized to give students significant amount of independent study time.

● Minor courses should be consolidated into major ones.

Report from CSCC Subcommittee on Teaching of Pathophysiology (1994)

● Establish a problem-based course in Clinical Therapeutics.

● Enhance the teaching of Pathophysiology.

Institute of Medicine report (1995)

● Eliminate marginally useful and redundant course content.

● Reduce excessive course loads.

● Shift curriculum hours from lectures to guided seminars that develop problem-solving skills.

● Prepare future practitioners for more medically based modes of oral health care.

Strategic Plan (1996 Revision)

● The curriculum should be intellectually challenging, scientifically current, and biomedically oriented.
● The curriculum should provide students with an education in which problem-solving and critical thinking are fundamental to the clinical instructional program.
● The curriculum should provide students with an education in which the principles of clinical medicine and physical and psychological diagnosis are better integrated with oral health care.
● The curriculum should promote life-long learning.
Curriculum Planning History and Process
Faculty Council (7/1/99)

The most recent round of thinking and planning for the curriculum began with the School of Dentistry's Faculty retreat in 1996, at which we agreed that the curriculum needed mending.

During the 1996-97 year, a Curriculum Planning Committee was formed and began to examine the existing curriculum.

At the Faculty Retreat in October 1997, the Curriculum Planning Committee presented a progress report to the faculty (the "Five Streams"), which was supportive of the plan. The Dean also spoke at this meeting of the resource implications of the plan and of the need to prioritize so that resources may be assigned to those initiatives having the highest priority.

During the 1997-98 year, the Curriculum Planning Committee was divided into five separate committees, one for each "Stream," each with its own chair. These committees developed a more detailed plan for consideration by the faculty. The elements of this plan were presented to the faculty as a whole in May of 1998.

At the Faculty Retreat in October 1998, the Curriculum Planning committee again made a presentation to the faculty. This proposal had more detail than the one made in the previous year, especially for the first two years of the curriculum (dental).

During the 1998-99 year, the Stream Chairs have continued their planning, and in the Winter and Spring quarters the plan has been discussed by the Educational Policy Committee in a series of six meetings. The proposal was also discussed by the Basic Sciences Coordinating Committee (BSCC, a sub-committee of the EPC) and the Curriculum Sciences Coordinating Committee (CSCC, also a sub-committee of the EPC). Both the CSCC and the EPC have voted to accept the reports presented to them on the proposed new curriculum, while recognizing that there is much work yet to do and that the plan will require resources for successful execution (faculty, administrative). The BSCC did not vote on the curriculum plan since it did not have quorum, but it did express collectively an enthusiasm for the plan.

In its current formulation, the curriculum plan represents a framework, a concept, a "work in progress." Its authors recognize that it would be inappropriate to refine the plan further without the participation of the individuals who are to lead the streams and by an individual appointed at the Associate/Vice Dean level who would have overall responsibility for the development and management of the curriculum. It will not be possible for these individuals to be hired or to devote sufficient time to curriculum planning without the expenditure of considerable resources, and so the next phase of the process should be for the faculty to consider the framework of the
plan and to assign it a level of priority. If the Faculty is enthusiastic about the plan, it is anticipated that the administration, with assistance from the faculty, will be able to identify the resources needed, at which time the plan can be further developed.
The Plan
Faculty Council (7/1/99)

- Course Material has been divided into five "streams"
  - Biomedical Sciences
  - Dental Sciences
  - Foundations of Restorative Science and Technology
  - Patient-Centered Care
  - Scientific Method and Clinical Dentistry

- Each stream has unique challenges
  - Biomedical Sciences - sequencing, pathophysiology course, elimination of unneeded material
  - Dental Science - consolidation, sequencing
  - Foundations of Restorative Science and Technology - sequencing
  - Patient Centered Care - defining competencies and establishing outcomes assessment procedures, sequencing
  - Scientific Method and Clinical Dentistry - a new course sequence to be installed where not previously existed

- Making it all work together (vertical integration)

- Progress has been made on each of the streams

- Resource implications of the planning process
  
  Overall management - Associate Dean for Curriculum (Education)?
  
  FTE help within each of the streams (e.g., Human Pathophysiology course)
• Detailed planning must await participation of individuals not yet appointed.
GOALS OF CURRICULUM PLANNING
EPC Meeting, March 4, 1999

- a curriculum that is not overcrowded and that contains **no more than 4-6 courses per quarter**,  
- a curriculum where the students are provided with significant amounts of **unstructured time**, so that they can learn some things on their own,  
- a curriculum that employs **active learning** methods and that has the ability to **assess the effectiveness** of what ever learning methods it employs,  
- a curriculum that teaches our students not only the information and skills needed to be a competent clinician, but that also gives them the means with which to become **life-long learners**  
- a curriculum where **basic sciences and clinical applications are thoroughly integrated**. Clinically relevant material should pervade all basic science instruction units, and the scientific method should pervade all clinical teaching. All faculty should understand the rationale for what they teach and why they teach it when they do (i.e., how it fits into the overall curriculum),  
- a curriculum that trains our students to be **competent oral physicians**, i.e., to understand the relationship between the oral/maxillofacial complex and the rest of the body  
- a curriculum that defines the **competencies** that it expects from its students and that has a system for assessing those competencies (**outcomes assessment**),  
- a means of continually **managing the curriculum** that uses both faculty and administrative resources and that applies academically sound global principles agreed on by faculty.
The proposal for curriculum revision carries with it resource implications for the implementation phase. Specifically, the Subcommittee foresees the following:

1. **Curriculum Administrator.** To successfully implement and support this plan, the school needs a new senior administrator whose assigned responsibilities will be directed toward the school’s educational programs and curriculum. This individual would need to be recruited, once a job description has been developed, and should probably be appointed at the Associate Dean level. We would seek someone whose credentials and interests are centered on dental education, and who has contributed original scholarly work to the literature in that field. This individual would help the stream leaders during the implementation phase, as well as providing leadership, direction, and instruction for a series of in-service programs to help faculty prepare for change.

2. **Stream Leaders.** Each of the five streams proposed in the plan will require a stream leader who will devote approximately 40% FTE to these duties (perhaps as much as 50% FTE in the early years). These individuals will be responsible for administrative oversight and management of the multidisciplinary, multi-unit courses taught within the streams. Initially, the stream leader will need to organize meetings with various faculty members who will be planning and teaching courses defined in that stream. Faculty will need to meet periodically to review student progress, ensure continuity from quarter to quarter and year to year, and assess faculty needs. The Subcommittee believes current faculty members have the expertise to serve as stream leaders for the Patient-Centered Care, Foundations of Restorative Science & Technology, and Foundations of Dentistry streams. It is not clear whether we currently have faculty who could serve as stream leaders for the Foundations of Biomedical Sciences or Scientific Method and Clinical Dentistry (SMCD) streams.
3. **Other Resources.** Implementing the proposal will require greater use of small group teaching classrooms (groups of 8-12 students). Many of the proposed courses, and the SMCD stream in particular, will require more computer-based study for students. The initial implementation phase will necessitate a series of in-service courses for faculty, probably spread out over 6-8 academic quarters.

In summary, we believe that implementing the new curriculum will require a total commitment of 3-4 FTE: 1 at the level of Associate Dean for Curriculum and 2-3 FTE divided among five stream leaders. Other resource implications include support for faculty in-service training and classroom space for small-group teaching (8-12 students/group).
### Current Biomedical Sciences Courses

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<thead>
<tr>
<th>Pre-Fall &amp; Fall</th>
<th>Winter</th>
<th>Spring</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
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<tr>
<td>Cell Structure &amp; Function</td>
<td>Human Metabolism</td>
<td>Physiology</td>
<td>General Pathology</td>
<td>Pharmacology</td>
<td>Nutrition</td>
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<td>Histology</td>
<td>Microbiology</td>
<td>Neuroscience</td>
<td>Oral Pathology</td>
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<tr>
<td>Anatomy &amp; Embryology</td>
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### Proposed Biomedical Sciences Stream

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<th>Winter</th>
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<th>Pre-Fall &amp; Fall</th>
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<tr>
<td>Cell Structure &amp; Function</td>
<td>Organ Systems and Human Pathophysiology</td>
<td>hematology &amp; cardiovascular</td>
<td>neurology</td>
<td>metabolism &amp; nutrition</td>
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<tr>
<td>Structure &amp; Pathology of Tissues</td>
<td>Infection &amp; Host Response</td>
<td>pulmonary</td>
<td>endocrine</td>
<td>oral &amp; maxillofacial</td>
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<tr>
<td>Structure of Organs (incl. Brain)</td>
<td></td>
<td></td>
<td>renal &amp; GU</td>
<td>gastrointestinal</td>
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FATE OF EXISTING COURSES
Biomedical Sciences Stream

Cell Structure & Function (Biochem 110A)

essentially unchanged. to the end of the existing course will be added 5 weeks of cell physiology (permeability) and cellular neuroscience (signaling)

Human Metabolism (Biochem 110B)

moved to "metabolism and nutrition" unit within Organ Systems and Human Pathophysiology course (Winter of second year, first 5 weeks)

Histology

merged with first half (non-systems) part of general pathology. some reorganization of material so that basic histology (cells, tissues) is covered first, followed general pathology, followed by systems histology, which will be aligned, where possible, with anatomy.

Microbiology

ccontent essentially unchanged. new course will have antibiotics from old Pharmacology course.

Gross Anatomy

ccontent essentially unchanged, except that a short section on neuroanatomy will be added at the end, as is currently done in the Medical School. course will start in mid Fall quarter and go for ca. 16 weeks.

Physiology

cell physiology will be added to end of current Cell Structure and Function course to generate 5 week segment on cell signaling, given in first half of Winter quarter. rest of course will become part of core of Organ Systems and Human Pathophysiology course and will be taught over two quarters (Spring of year 1, Fall of year 2).
Neuroscience

neurophysiology will join with cell physiology and be added to end of current Cell Structure and Function course to generate 5 week segment on cell signaling, given in first half of Winter quarter. neuroanatomy will be added to end of current Gross Anatomy course and will be given at end of Winter Quarter, year 1. systems topics (e.g., control of movement) will move to "neurology" segment of Organ Systems and Human Pathophysiology course. some of material on pain will be moved to a course in the Dental Sciences stream on pain and its management.

General Pathology

will be divided into two segments -- the first half of the course will be merged with current Histology course and will be given at the current time, in September. The second half of the course, on systems-specific topics, will be moved to the Organ Systems and Human Pathophysiology course and will be taught over the Spring Quarter of year 1 and Fall quarter of year 2. This material will be taught specifically to the S/D students at this time.

Oral Pathology

will be moved to the final segment of the Organ Systems and Human Pathophysiology course and will be taught over six weeks in the Winter quarter, year 2.

Nutrition

some reduction in course content. surviving parts will be moved to segment on "metabolism and nutrition" in the Organ Systems and Human Pathophysiology course.

Oral Medicine

will form part of Organ Systems and Human Pathophysiology course.
section on pharmacodynamics and pharmacokinetics will be moved to cell signaling part of Cell Structure and Function course and will be given in first half of Winter quarter, year 1. section on antibiotics will be moved in with the appropriate part of the Microbiology course. the rest will form part of the core of the Organ Systems and Human Pathophysiology course and will be taught over the Spring Quarter, year 1, and Fall Quarter, year 2.
Faculty Council (7/1/99)
DESCRIPTION OF NEW COURSES
Biomedical Sciences Stream

Cell Structure and Function

first 10 weeks essentially unchanged. Final 5 weeks contain material on cell signaling (permeability, ion channels, pumps, exchangers, pharmacodynamics, pharmacokinetics, electrical signaling in nerve and muscle, intercellular communication in the nervous system).

Structure & Pathology of Tissues

consists of the histology course combined with the first half of the General Pathology Course (inflammation, cell injury, healing, repair, regeneration, neoplasia). The material from the histology on cells and tissues will be presented first, followed by general histology topics, followed by organ-specific histology topics, which will be taught in parallel with organ-specific anatomy topics in the Gross Anatomy course)

Infection & Host Response

the current Microbiology course with the addition of the Pharmacology lectures on antibiotics

Structure of Organs

the current Gross Anatomy and Head & Neck Anatomy courses, with the addition of a 2 week segment on Neuroanatomy at the end.

Organ Systems and Human Pathophysiology Course

a new 3 quarter course in which the physiology, pathology, pharmacology, and therapeutics of individual organ systems will be taught. This course incorporates all of the current Oral Medicine 122 course, as well as the bulk of the current Physiology and Pharmacology courses. It culminates with a block of material on the Oral and Maxillofacial system, currently taught as a separate 1.5 quarter Oral Pathology course.
Cardiovascular Module in Organ Systems & Human Pathophysiology Course

- Review of Gross and Microscopic Anatomy
  
  (1 lecture)

- Physiology
  
  (5 hours of lecture - covering pulmonary circulation, systolic and diastolic pressure, signal conduction, parasympathetic and sympathetic control, pumping cycle, pressure-volume curves, arterial pressure, control of flow, resistance, autoregulation, baroreceptors, chemoreceptors, fluid exchange, filtration, osmotic pressure, venous return)

- Pathology
  
  (2 hours of lecture - covering edema, congestion, thromboembolism, infarction, hemorrhage, shock, atherosclerosis, arteriosclerosis, ischemic heart disease, rheumatic heart disease, endocarditis, hypertension, coronary artery disease)

- Microbiology
  
  (1 hour of lecture - covering endocardial factors, bacterial factors, etiology, clinical manifestations)

- Pharmacology
  
  (4 hours of lecture - covering adrenergic drugs, cholinergic drugs, hypertension, anti-arrhythmics, angina, and congestive heart failure)

- Therapeutics
  
  (1 hour of lecture - covering treatment, prevention, prophylaxis)

- Synthesis / Case Studies / Relevance to Oral Cavity
  
  (4 hours of small group discussion concerning two cases)
Total contact time: 18 contiguous hours

Total hours previously devoted to topic: 23, in 6 separate courses given over 5 quarters
Introduction to Dentistry

In this first in this series of dental science courses, the student would get a simple yet comprehensive overview of the normal appearance, structure, and morphology of dental and oral tissues from a visual, gross microscopic and radiographic viewpoint. In addition the basics of normal occlusion, morphology and interarch relationships would be presented. These foundation lectures on the normal oral structures would be followed by a basic overview of the basic dental diseases and dental conditions that the student will encounter in more detail in subsequent courses in the dental sciences. These include caries, periodontal diseases, pulpal diseases, malocclusions, temperomandibular disorders and developmental defects.

Structure and development of the oral cavity

This comprehensive course would give the student an overview of craniofacial development leading to a focus on the development of the oral cavity, tooth, and periodontal structures. The fine structure of the teeth and periodontium, eruption and exfoliation would be presented from a developmental standpoint so that the student had an appreciation of the structure of oral tissues as well as the pathways for repair, regeneration and remodeling of these structures during dental diseases and their applications in therapeutic strategies. Finally the various induction, differentiation and signaling mechanisms involved in the development of the structures in the oral cavity would be presented from a molecular biological, and genetic standpoint. The material presented in this course would serve as the necessary foundation for the subsequent courses dealing with etiologies, risk assessment and therapeutic approaches to dental diseases and dental conditions.

Etiology and Risk Factors in Dental Diseases and Dental Conditions
This 15 week course would introduce first year dental students to the various, metabolic, microbial, physiological, and pathological processes that contribute to the dental diseases of caries and periodontal diseases, developmental defects, and temperomandibular/occlusion disorders. In many ways this course would take the Oral Biology 108 series concept and expand it to encompass a more broad thematic and multidisciplinary approach to dental diseases and dental conditions. For example, where there are identical or similar mechanisms in the pathogenesis of periodontal and pulpal diseases, these subjects would be taught as an integrated block emphasizing both the similarities and differences between these two disease. A similar comparative block of material would center on the theme of the microbiology of caries, pulpal, and periodontal diseases. In addition, other themes within this course would be built around the etiologies of dental diseases and conditions that share some common characteristics while also having their own distinctive characteristics (e.g. nutrition, stress, etc.). Such an integrative approach would also be built around topics that are normally taught over several courses.

After this major section on the pathogenesis and role of major factors in the initiation and progression of dental diseases and conditions, the final portion of the course would center on an introduction to the biological basis for developing diagnostic tools to determine the presence of these dental diseases and conditions, identify patients at risk and determining future treatment outcomes.

**Fundamentals of Dental Therapy**

This 12-15 week course would present the major principles of treatment of dental diseases. Such principles would include antimicrobial therapies for the treatment of caries, periodontal diseases and other oral infections; repair, remodeling and regeneration of both hard and soft tissues; and control of mineralization and demineralization. As discussed in the previously described course on risk factors, individual dental disease do have unique approaches to treatment. However, there is also considerable common ground between the various diseases to permit an integrated discussion of these therapeutic approaches. Each treatment approach would first deal with the common basis of therapy and then lead to the unique approaches to the treatment of individual dental conditions.

One final integrative approach to the treatment of dental diseases and conditions would be a presentation of the general principles that underlie caries and periodontal disease prevention, malocclusions, temperomandibular dysfunction etc. This approach would include such principles as plaque control, correction of parafunctional habits, diet counseling, psychological counseling, and other interventions to eliminate risk factors.

**Oral Pain, Oral Neuromuscular Function**

These integrative courses would center on the physiology, anatomy, pharmacology and therapeutic principals to dental and oral pain in general and then to occlusal and temperomandibular function and dysfunction.
The first section of the course would integrate the material given on the principals of pain reception, propagation and perception through gross and microscopic anatomical, neurophysiological, pharmacological and psychological approaches. The principals and clinical application of both local anesthesia and systemic analgesia would be presented in this section.

The second portion of the course would discuss the anatomical, physiologic, pharmacological and therapeutic principals of occlusal and temperomandibular dysfunction. This presentation would incorporate the neurophysiology, neuromuscular physiology, pharmacology, and diagnostic and therapeutic approaches into an integrated presentation.
Introduction to Dentistry Course
Proposed Schedule

Week 1

*Introduction: The scope and changing role of dentistry in human health*

A series of 2-3 lectures to give the incoming student an overview of the scope of the current
discipline of dentistry and the emerging role of oral/dental diseases and conditions with
systemic diseases and human health.

Week 2

*PART I: The oral cavity in health*

3 Lectures

1. The normal appearance of primary and permanent dentition, oral mucosa, and the
   periodontium

2. Normal inter-arch relationships of the permanent dentition. Introduction to occlusion

3. The basic diagnostic tools in dentistry: Visual inspection of hard and soft tissues and
   the occlusion, the explorer, the periodontal probe, and dental radiographs. What these
tools tell us about the oral cavity in health.

Week 3

1. Clinical exercises on each other using the basic clinical tools to determine normal parameters
   and to detect early changes associated with dental conditions and diseases.

2. A small group discussion in which dental faculty presents normal findings (facilitating
   questions and answers form the students) through patient history, slides and radiographs.

Week 4
PART II: The oral cavity in disease

4 Lectures

1. Introduction to coronal caries, root caries, the spread of caries to the pulp.

2. Introduction to periodontal diseases. The role of plaque in the progression of gingivitis to chronic adult periodontal diseases. Early onset periodontal diseases.

3. Abnormalities in the development of oral structures.


Week 5

1. Two small group sessions to discuss the basic oral conditions and diseases with emphasis on how diagnostic tools are used to assess these conditions through presentation of patient slides, clinical findings and radiographs. Similar in structure to the small group discussions in Week 2.

2. One or two problem based exercises in which the student is presented with clinical data from a healthy mouth and a mouth with overt dental disease and asked in a series of questions to ascertain what is going on, what other information may be needed, and how we might treat such a condition. (This exercise for incoming student would be very basic at first and would be a framework for similar thinking exercises in following years with dental cases of increasing complexity--as introduced in the "patient centered care" and/or "scientific method" stream)

Weeks 6-8

Part III: The Language of Dentistry

An introduction to the basic orientation terms in clinical dentistry as well as basic descriptive morphology and anatomy of the primary and permanent dentition. The purpose of this section is to give the student a framework both the first basic laboratory and clinical procedures as well as a foundation of the developmental processes in tooth formation.

1. For the orientation of clinical dentistry section, there would be two lectures and a student clinical section on basic patient position and orientation. This section would coordinate with the material that would be given concurrently and later in the introductory courses in the patient centered care stream.
2. For the section on basic dental morphology, there would be 3-4 lectures followed by 1-2 small seminars on tooth identification and crown and root morphology. This material would coordinate with and be followed by the basic laboratory procedures in the restorative dentistry stream.
Oral Structure and Development Course
Proposed Schedule

We envision a 2 unit course to be given in the Winter quarter of the First year with a mixture of formal lectures (especially in the beginning of the course), review seminars designed both to review the essential background material and reinforced with clinical and research examples, and more independent instructor-guided independent study by the student for the latter part of the course dealing with biologic mechanisms of development.

Part I/ weeks 1-6 - The "language" of oral and facial development

Week 1-Week 2.5

Overview of Oral and Craniofacial Development

This section would cover development from branchial arches through the primitive stomatodeum and development of the basic soft and hard tissue structures (including palate, maxilla, mandible, but excluding tooth and periodontium)

We would anticipate that these first topics would be a transition from the developmental material given in the Head and Neck Anatomy course in the Fall quarter of the First year. There would be one or two formal overview lectures followed by smaller group seminars to introduce the student to developmental defects (e.g. cleft palate, Crouzons, etc.) which illustrate the principles of oral and craniofacial development

Week 2.5-Week 6

Development of the Teeth and Periodontal Structures

This material would be presented in a series of formal lectures alternating with review seminars with clinical examples for reinforcement.

The first topics would include the overall scheme of tooth and periodontal development, followed by lectures devoted to the development of the specific tissues of these structures including enamel, dentin, pulp and the periodontium. Students would learn microanatomy through the development of these structures. We would envision a review seminar to follow the material on overall development and enamel development and another review seminar to follow dentin, pulp, and the
periodontium. Clinical problems used to reinforce these topics would include the developmental basis for acid etching of enamel, periodontal guided tissue regeneration, etc.

Part II/ Weeks 7-10 - The Biological Basis of Oral Development

This section of the course would involve more self directed learning by the students. As the students will already have the necessary molecular biology background in the fall quarter of the first year, we would propose several lectures on the molecular basis of the principles of induction, differentiation and morphogenesis, followed by a series of problems based upon topics now given as lectures in G&D 110.
Part I (weeks 1-2)

**Fundamentals of bacterial adherence, colonization, and invasion.**

This series of lectures would center on the formation of dental plaque, ecology of supragingival, subgingival, root surface, and pit and fissure plaque formation.

Part II (weeks 3-4)

**Pathways of microbial infection**

This series of topics would first center on the pathways of infection into hard dental tissues (enamel demineralization/mineralization, dentin tubule invasion, pathways and defenses for microbial invasion into the pulp) followed by a similar series of lectures on pathways of microbial invasion into periodontal soft and hard tissues (role and breakdown of protective barriers, direct microbial invasion, penetration of bacterial enzymes and endotoxins)

Part III (weeks 5-7)

**Role of the host response in periodontal, carious and pulpal infection**

I would first envision 4 lectures devoted to the host response in periodontal diseases using the newly developed "Critical Path" model to tie this rather complex topic together. By using this "Critical Path" model each lecture would be devoted to each sequential segment and would include:

a. the first line of defense (neutrophils, complement local humoral and secretory antibodies) and the bacterial virulence factors which overcome these defenses.

b. The lymphocyte monocyte axis of the host defense: protective and destructive roles with emphasis of the difference of monocyte/lymphocyte-derived regenerative vs. inflammatory of cytokines and growth factors.

This lectures would be followed by 2 lectures on the similarities and differences of host
response to caries (secretory antibodies) and the pulp (e.g. inflammation in a low compliance system and origins of pulpal pain).

Part IV (Weeks 8-10)

Basic systemic and local modifiers of caries, periodontal diseases, and pulpal diseases

A series of integrated lectures on the role of common modifiers including:

a. effects of non physiologic mechanical forces on oral tissues: effects of torque on cervical enamel; remodeling of periodontal tissues in controlled tooth movement; effects of increasing magnitudes of occlusal trauma on the tooth, periodontium, and pulp. (one week)

b. Effects of major systemic factors on dental diseases. There is obviously a lot of material that could be presented in this section. I would envision that we would concentrate on a few of the major topics and reinforce these and other systemic risk factors in second and third year courses.

For now I would concentrate on the role of:

   a. basic influences of aging
   b. immunosupressive diseases
   c. smoking/ diabetes
   d. diet/ effects of reduced salivary flow

(one lecture each over two weeks)

Part V (week 11)

Review

a necessary week in this course as we would, at the end of week 10, be at the end of DI Spring and would have a summer break.

Part VI (weeks 12-14)

Fundamentals of Dental Diagnosis and Risk Assessment for Dental Diseases.

A series of integrated topics focusing how various diagnostic and risk assessment and
approaches can be used for the major dental disease of microbial origin. I would envision one week each devoted to the following topics.

a. What we can learn from the oral fluids (saliva, and gingival crevicular fluid) including assessment of bacterial and host enzyme activity, microbial profiles, and microbial products.

b. Assessing genetic predisposition to dental diseases.

c. The role of stress in dental diseases. Physiological and psychological assessment of patients at risk

d. Introduction to the mutual interactions between oral and systemic diseases. Role of the systemic spread of oral microbiota and oral inflammatory mediators in cardiovascular diseases, organ system infection, low birthweight etc. Effects of loss of masticatory function from dental diseases on overall health.
Fundamentals of Dental Therapy
Proposed Schedule

Part I  

Weeks 1-4 (Second Half of Year II Fall)

Control of Dental Infections and their Oral Sequellae

An introduction to the control of the oral flora through the use of the major groups of antimicrobial agents available to the dental practitioner. This section would include principles of the antimicrobial properties of mouth rinses, topical agents, local and systemic delivery of fluorides and, local and systemic delivery of antibiotics.

Part II  

Weeks 1-5 (Year II Winter Quarter)

Principles of Regeneration and Repair in Dental Diseases.

Introduction to the common mechanisms of regeneration and repair of the hard and soft tissues of the oral cavity, followed by a discussion of specific repair and regeneration for individual oral tissues such as dentin pulp and the periodontium.

An example of how such a section would follow the similar organizational pattern for the previous risk factors course would be in the area of wound healing. Specifically, the introductory material would center on the fundamental processes of wound repair and regeneration of hard and soft tissues including

1. the role of growth factors,
2. modification of inflammation,
3. mineralization, demineralization, and remodeling of oral hard tissues (enamel, dentin, bone).

This common section would be followed by specific therapeutic approaches to dental disease including strategies of dentin regeneration and repair, strategies for enhancing periodontal regeneration and repair, etc.

Part III  

Weeks 6-10 (Year II Winter Quarter)
Fundamentals of Prevention

This two-course series would close by coming full circle in a presentation of the basic, yet most critical strategies for reducing and/or eliminating the risk factors for the major dental diseases. This section would include a cross discipline presentation and discussion of such fundamental strategies and

1. home care, application of topical and systemic fluorides, justification for the use of sealants,
2. reducing the harmful effects of local factors (smoking, parafunctional habits etc.)
3. Alleviating systemic and psychological factors related to oral diseases and conditions (stress, diabetes, nutrition, etc.)
4. Understanding the role of socioeconomic factors in the prevention and treatment of oral diseases.
Part I - The physiology and biochemistry of pain perception

Weeks 1-2

Three lectures dealing with the fundamentals of pain perception and propagation in the oral cavity with special emphasis on the factors responsible for generation of electrical potentials in nerve fibers. These lectures would expand upon the fundamentals of electrical and chemical potential generation from the fundamental neurophysiology material given in the fall and winter quarters of the first year and would focus on signal propagation along the anatomically different nerve fiber groups associated with the oral cavity in general, pulp and periodontium. In addition, lectures on synaptic control of the transmission and perception of pain in relation to the oral cavity would be discussed. At this point I would just focus on pain on not other proprioceptive or other oral sensations, and leave those topics to the second in the series of these courses on the anatomy, neurophysiology and muscular physiology of occlusion and TMJ function.

Part II - Classification and Fundamentals of Diagnosis of Oral-Facial Pain

Weeks 3-5

A series of three to four lectures dealing with the principal sources of dental/oral-facial pain including.

a. pain of strictly neurological origin
b. pain of muscular origin
c. pain of vascular origin
d. pain from inflammation and necrosis

For each of these topics we would expand upon the basic principles given in the first two weeks of this course with emphasis both the physiology and the anatomical pathways of the propagation and perception of these pain sources. These discussion of the anatomical pathways of different types of oral-facial pain would serve as a bridge
to the next series of topics on local anesthesia. This section would end with small
group clinical correlation exercises including fundamentals of differential diagnosis of
oral-facial pain based upon history and description of clinical, laboratory and other
findings.

Part III- Fundamentals of Local Anesthesia

Weeks 6-8

An integrated series of 3-4 lectures on the pharmacology of local anesthesia and
anatomical basis of local anesthesia techniques, followed by student practice on each
other in some of the basic topical, infiltration, and nerve block techniques. This section
would end with clinical -basic science correlation small group discussions dealing
problems on local and systemic influences on local anesthesia. Such small group
discussion topics would center on a series of clinical problems such as systemic
implications of inadvertent intravenous injection, effects of local inflammation etc. and
would tie together both the clinical and basic science principles learned up to this
point.

Part IV- Introduction to Systemic Control of Dental/ Oral -Facial Pain

Weeks 9-10

Two lectures on the pharmacological basis of the control of dental pain with special
emphasis on the actions and uses of NSAIDS. (Steroid drugs and opiate analgesics
would be given in the second or third year course dealing with more advanced topics
in pain control). This would be followed by a final lecture on the basic psychological
considerations in the perception and control of dental/ oral-facial pain. The final small
group discussion would focus on clinical problems involving the influence of medical
conditions and psychological factors on local anesthesia and on non-prescription
analgesia, and would serve as a bridge to the next pain course in this series.
Part I Sensory Systems of the Head and Neck

Oral mucosa: Taste, Temperature, Pressure, Pain

Muscle: Tension, Length, Pain

Temporomandibular Joint: Opening, length, pressure, pain, temperature

Complex and integrated sensory perception: texture, shape

Part II Imaging the Head and Neck

Temporomandibular joint imaging approaches: full head x-rays, corrected tomograms, magnetic resonance, computed tomography

New techniques in 3-D reconstruction of craniomandibular coordinates:

Applying Sculptor to combine multiple imaging techniques

Movement patterns of the bilateral condyles: rapid MRI, ultra-fast CT, combining mechanical tracking systems using multiple points with 3-D reconstructed craniomandibular skeletons

Part III Forces Applied within the Craniomandibular Region

Bite forces measured on single teeth with and without bite direction

Multiple tooth bite measures and present problems in obtaining
Projecting forces to condyles: computer programs and approaches to determine forces on condyles

Relating multiple bilateral jaw muscles to forces developed within the mandible, on the condyle, and on the zygomatic arch

**Part IV Muscles of the Jaw and Face**

Facial muscles: their relevance to attitude and "reading" your patient

Lip muscles: Forces on the dentition

Jaw muscles:

- jaw-closing muscles as multipennate muscles: compartmentalization of function for jaw resting posture, speech and chewing

Jaw opening muscles: dual function with the jaw and hyoid bone

Recruitment patterns: coactivation to load and move mandible

Tongue: multiple tasks with intrinsic and extrinsic muscles

- Coordination of control of tongue with jaw
- Relevance of posterior tongue to respiration and pharynx

**Part V Feeding, Chewing, Swallowing**

Feeding: integration chewing into the broader concept of incising, transporting, chewing and swallowing

Swallowing: the oral phase, then pharyngeal and esophageal

Chewing: Central and peripheral controls
How muscles are recruited
Importance of sensory feedback

Part VI Pathophysiology
Condyle and temporomandibular joint: Concepts of how shape changes can occur
Examples of changes in condylar shape: potential factors inducing
Jaw Muscles: mechanisms that induce pain within the belly and tendon
  Tendon pain
  Muscle pain
Inflammation and mechanisms of acute muscle pain
Distinguishing myofascial pain from fibromyalgia pain
Altered taste sensations and feeding effects
Occlusion and chewing abnormalities
Chewing in hemimandibulectomy patients
### COMPETENCIES IN THE CURRICULUM

I=Introduced, M=Measured

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#### #1. PROFESSIONALISM

1. Provides safety & wellbeing
   - I
   - M
   - M
   - M

2. Certified in CPR
   - I

3. Apply sci. findings to clin. problems
   - I
   - M
   - M
   - M

4. Radiographic knowledge/safety
   - I
   - I
   - M
   - I
   - M

5. Demonstrates ethical behavior
   - I

6. Demonstrates professionalism
   - I
   - M
   - M
   - M

#### #2. PATIENT ASSESSMENT

1. Take & evaluate med/dent hist
   - I

2. Recognize systemic symptoms
   - I

3. Develop & perform treatment plans
   - I

4. Perform dx tests for endo
   - I

5. Interpret & explain biopsy report
   - I

6. Differential dx, soft tissue lesions
   - I

7. Expose, process & mount FMX
   - I

8. Expose & process panoramic x-rays
   - I

9. Dx & plan dental care for children
   - I

10. Dx & provide pulp therapy
    - I

11. Complete & document perio exam
    - I

12. Diagnose periodontal status of pts
    - I

13. Conduct & document exam of teeth
    - I

14. Planned care sequence for repair
    - I

15. Planned care sequence, replacement
    - I

16. Recognize physiol/nonphysiol mastic.
    - I

#### #3. BEHAVIORAL SCIENCE

1. Take & evaluate med/dent hist
   - I

2. Communicate effectively with all pts
   - I

#### #4. DISEASE PREVENTION & MGMT

1. Teach effective plaque control to pts

2. Develop & manage recall/maint progs

3. Pain & anxiety control procedures

4. Dx & treat dental emergencies

5. Place pit & fissure sealants

6. Prescribe fluoride supplements

7. Perform root canal therapy

8. Evaluate, dx. perform exodontia

9. Assess & manage malocclusions

10. Dx & manage space mgmt problems

11. Treat gingivitis; scale & root plane

12. Prevent gingivitis/periodontal for pts

## 5. Restoration of Form, Function, and Esthetics

5.1. Treat dental caries in children

5.2. Remove disease & restore tooth

## 6. Comprehensive Dental Care

6.1. Comp care for aged, special needs pts

6.2. Comprehensive patient mgmt

6.3. Comprehensive care skills

6.4. Independently provides comp care

### COMPETENCIES IN THE CURRICULUM

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### #2. Patient Assessment

2.1. Take & evaluate med/dent hist

2.2. Recognize systemic symptoms

2.3. Develop & perform treatment plans

2.4. Perform dx tests for endo

2.5. Interpret & explain biopsy report

2.6. Differential dx. soft tissue lesions
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#### #1. PROFESSIONALISM

1.2. Certified in CPR

1.3. Apply sci. findings to clin. problems

1.4. Radiographic knowledge/safety

1.5. Demonstrates ethical behavior

1.6. Demonstrates professionalism

#### #2. PATIENT ASSESSMENT

2.1. Take & evaluate med/dent hist

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2.3. Develop & perform treatment plans

2.4. Perform dx tests for endo

2.5. Interpret & explain biopsy report

2.6. Differential dx, soft tissue lesions

2.7. Expose, process & mount FMX

2.8. Expose & process panoramic x-rays

2.9. Dx & plan dental care for children

2.10. Dx & provide pulp therapy

2.11. Complete & document perio exam

2.12. Diagnose periodontal status of pts

2.13. Conduct & document exam of teeth

2.14. Planned care sequence for repair

2.15. Planned care sequence, replacement

2.16. Recognize physiol/nonphysiol mastic.

#### #3. BEHAVIORAL SCIENCE

3.1. Take & evaluate med/dent hist
### #4. DISEASE PREVENTION & MGMT

| 4.1. Teach effective plaque control to pts | M |
| 4.2. Develop & manage recall/maint progs | M |
| 4.3. Pain & anxiety control procedures | M |
| 4.4. Dx & treat dental emergencies | M |
| 4.5. Place pit & fissure sealants | M |
| 4.6. Prescribe fluoride supplements | M |
| 4.7. Perform root canal therapy | M |
| 4.8. Assess & manage malocclusions | M |
| 4.9. Dx & manage space mgmt problems | M |
| 4.10. Treat gingivitis; scale & root plane | M |
| 4.11. Prevent gingivitis/periodont for pts | M |

### #5. RESTORATION OF FORM, FUNCTION, AND ESTHETICS

| 5.1. Treat dental caries in children | M |
| 5.2. Remove disease & restore tooth | M |

### #6. COMPREHENSIVE DENTAL CARE

<p>| 6.1. Comp care for aged, special needs pts | I |
| 6.2. Comprehensive patient mgmt | M |
| 6.3. Comprehensive care skills | M |
| 6.4. Independently provides comp care | I |</p>
<table>
<thead>
<tr>
<th>Criteria for Assessment</th>
<th>How Measured</th>
<th>When Introduced</th>
<th>When Measured</th>
<th>Measure as of Apr 99</th>
<th>Actions Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 1: Provides Safety and Wellbeing</td>
<td>a. Workspace disinfected and prepared according to the UCSF School of Dentistry Infection Control Guidelines (ICG) b. Treatment rendered according to ICG guidelines.</td>
<td>Oct / D1</td>
<td>Dec, Mar, Jun/D1 Sep, Dec, Mar, Jun/D3 Sep, Dec, Mar, Jun/D4</td>
<td>75% pass rate on examination</td>
<td></td>
</tr>
<tr>
<td>1 - 4: Radiographic Knowledge/Safety</td>
<td>Written examination.</td>
<td>Sep, Oct, Jan/D1</td>
<td>Dec, Mar, Jun/D1</td>
<td>Pass course</td>
<td></td>
</tr>
<tr>
<td>1 - 5: Demonstrates Ethical Behavior</td>
<td>The Student: 1. Promotes and respects the autonomy of the patient. a. Daily clinical observation by faculty.</td>
<td>Sep / D2</td>
<td>Sep, Dec, Mar, Jun/D3</td>
<td># of incident reports</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Solicits and respects the values and preferences of the patient. b. Competency examinations.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>3. Demonstrates by example, values and attitudes that are consistent with the profession and promotes oral health and the education of patients.</td>
<td></td>
<td></td>
<td>Patient Satisfaction Survey</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A score of 2.5 or lower on the Competency exam.</td>
<td></td>
</tr>
</tbody>
</table>
4. Determines competency of the patient to give informed consent.

5. Promotes the confidentiality of patient records.

6. Determines and communicates the risks, cost, benefits and alternatives to any proposed treatment.

7. Delivers care within his or her ability.

8. Places the well being of the patient ahead of his or her personal desires or obligations.

9. Respects colleagues and supports their relationships with their patients.

### 1 - 6: Demonstrates Professionalism

**a. While providing comprehensive care, demonstrates professional integrity, good judgment.**

- a. Clinical evaluation form from floor faculty, D3/D4
- Oct / D1 Oct / D3
- Dec, Mar, Jun/D1 Mar, Jun/D3 Mar, Jun/D4
- a. Clinical Independence Scores = or < 2 by Spring of D4 year

**b. Development of mature, sensitive and effective relationships with patients, staff, peers and faculty.**

- b. Survey sample of peers/staff/faculty/patients (at time of appt.)
- b. Score = or >4 ave (1-5 scale) of maturity/caring/sensitive to needs + good communication.

**c. Accepts and receptive to constructive criticism and responds with appropriate behavioral changes.**

- c. Clinical evaluation from floor faculty in D3, D4 years
- c. Non Devisive; makes good use of feedback; able to work a variety of faculty w/o difficulty

**d. Tolerates physically taxing work loads and functions effectively under stress.**

- d. 1. Attendance
- d. 2. Completes assigned casework & clinical work.
- d. Attendance guidelines Completes coursework & clinical care on time.

**e. Adapts to changing environments, displays flexibility, functions effectively in the face of uncertainties.**

- e. NPV, ER patients
- e. NPV, ER patients Special needs patients Rotation to Specialty
- e. Handles change seamlessly with even disposition and consistently good judgement.
<table>
<thead>
<tr>
<th>f. Possesses defined level of fundamental knowledge in basic and dental sciences as well as critical thinking skills defined as measure, calculate, reasoning, reasoning, analysis, integration and synthesis to deliver comprehensive care.</th>
<th>f. Oral Dx skills tested by floor faculty in D3, D4 years.</th>
<th>f. Pass ODTP QE D4 Pass selected case presentation to peers and coach during D3, D4 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>g. Compassion, integrity, honesty, concern for others, interpersonal skills, motivation, curiosity, congenial.</td>
<td>g. D3 NVP QE Patient Complaints random sample of patients surveyed</td>
<td>Pass D3 NVP QE ≤ or &lt; 1 patient complaint in D4 or D4 year / 90% or better on patient survey</td>
</tr>
<tr>
<td>h. Student delivers care within the scope of his or her ability.</td>
<td>e. Faculty evaluation of care in CC 139 &amp; CC 149</td>
<td>Asks for help when appropriate</td>
</tr>
<tr>
<td>i. Student demonstrates ethical behavior. (See Ethics Competency)</td>
<td>See Ethics</td>
<td>Does not attempt TX outside ability or clinic protocol</td>
</tr>
<tr>
<td>Criteria for Assessment</td>
<td>How Measured</td>
<td>When Introduced</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>2 - 1: Take and Evaluate Medical/Dental History</td>
<td>a. Take and properly interpret vital signs</td>
<td>Oct / D1</td>
</tr>
<tr>
<td></td>
<td>b. Secure relevant HM/DH information</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Incorporate precautions into Tx plan</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Medical and dental histories are fully and correctly interpreted</td>
<td></td>
</tr>
<tr>
<td>2 - 2: Recognize Systemic Symptoms</td>
<td>a. Perform an examination of the head and neck and detect and describe any visible or palpable abnormalities</td>
<td>Oral Diagnosis QE</td>
</tr>
<tr>
<td></td>
<td>b. Perform a thorough oral examination and detect and describe any visible or palpable abnormalities in the hard or soft tissues of the oral cavity</td>
<td></td>
</tr>
<tr>
<td>2 - 3: Develop and Perform Treatment Plans</td>
<td>a. Complete and present 5 Tx plans requiring sequencing of 2 different treatment modalities</td>
<td>a. b. Restorative Diagnosis and Treatment Planning Manual</td>
</tr>
<tr>
<td></td>
<td>b. Completes and presents 3 Tx plans requiring sequencing of those completed cases</td>
<td></td>
</tr>
<tr>
<td>2 - 5: Interpret and Explain Biopsy Report</td>
<td></td>
<td></td>
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<tr>
<td>------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Observation in clinic</td>
<td>b. Clinic observation</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2 - 6: Differential dx, Soft Tissue Lesions</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. Write correct referral to oral medicine or biopsy suspicious lesions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2 - 7: Expose, Process &amp; Mount FMX</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. Completion of FMX sets (Manikin and patients).</td>
</tr>
<tr>
<td>b. 2 FMX sets on a manikin (with less than 3 retakes on the second set); 2 FMX sets on patients in the first year rotation.</td>
</tr>
<tr>
<td>c. 10 FMX sets on patients in the third year of rotation</td>
</tr>
<tr>
<td>----------------------------------------</td>
</tr>
<tr>
<td>a. Written examination</td>
</tr>
<tr>
<td>b. Completion of Panoramic films during the first year rotation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2 - 9: Dx and Plan Dental Care for Children</th>
<th>Jul / D3</th>
<th>Sep / D4</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Recognize primary dentition sequence of eruption and space management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Communicate effectively with parents and guardians.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Recognize a fearful child</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Recognize a defiant child</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Utilize methods to gain a child’s trust and cooperation. Recognize the need for appropriate referral.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2 - 10: Dx and Provide Pulp Therapy</th>
<th>Jul / D3</th>
<th>Sep / D4</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Diagnose pulp involvement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Understand anatomy of the primary pulp.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Complete appropriate pulp treatment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2 - 11: Complete and Document Perio Exam</th>
<th>Periodontal Examination QE</th>
<th>Oct / D1</th>
<th>Mar / D3</th>
<th>100 % Pass of QE</th>
</tr>
</thead>
</table>
### 2 - 12: Diagnose Periodontal Status of Pts

| Make a correct periodontal diagnosis. | Periodontal Diagnosis QE | Oct / D1 | Mar / D3 | 100% Pass of QE |

### 2 - 13: Conduct and Document Exam of Teeth

By radiographic and clinical examination, identify and document the following:

**Review of examination by attending faculty**

| Oct / D1 | Jun / D3 | All necessary information for development or rational diagnosis and treatment plan. |

- a. Teeth present and missing

- b. Recognize existing restorations as:
  - a. Has been provided
  - b. Has not been provided but deficiencies are not harmful to general health
  - c. Has not been provided such that deterioration of conditions harmful and dangerous to patient is not possible
  - d. Not clinically acceptable, damage now occurring
  - e. Alterations of tooth resulting from function, fracture or local or repetitive factors
  - f. Caries penetrating to the dentin
  - g. Decalcifications with or without cavitation

### 2 - 14: Planned Care Sequence for Repair

| Apr / D2 | Jun / D3 |

### 2 - 15: Planned Care Sequence, Replacement
<table>
<thead>
<tr>
<th>Task</th>
<th>Jan / D2</th>
<th>Jun / D3</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Complete two removable pros. Tx plans.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Complete two fixed pros. Treatment plans.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2 - 16: Recognize Physiol/Nonphysiol Mastic.

<table>
<thead>
<tr>
<th>OdT.P./CRES Manual</th>
<th>O.D.T.P Qualifying Examination</th>
<th>Sep, Oct, Jan, Apr / D1</th>
<th>Sep, Dec, Mar, Jun / D3</th>
<th>Passing grade 70% on Q. E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Student identifies the condition of the masticatory system including TMJ function, cranio-mandibular relationship, muscles of mastication and occlusion</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>b. Student distinguishes masticatory systems that are physiologic from those that are non-physiologic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Criteria for Assessment</td>
<td>How Measured</td>
<td>When Introduced</td>
<td>When Measured</td>
<td>Comp. Outcomes Measure</td>
</tr>
<tr>
<td>------------------------</td>
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<td>---------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>a. Review patient records and diagnose a spectrum of malocclusion problems</td>
<td>Case-based exams in: Ortho 121 (Sp, D2)</td>
<td>Apr/D2</td>
<td>Jun/D2</td>
<td>100% Pass</td>
</tr>
<tr>
<td></td>
<td>Ortho 131 (Su.F.W, D3)</td>
<td>Jul, Oct, Jan/D3</td>
<td>Sep, Dec, Mar/D3</td>
<td>100% Pass</td>
</tr>
<tr>
<td>b. Discuss findings and assess treatment needs (including treat or refer)</td>
<td>Chairside case review in: 3rd Year Ortho</td>
<td>Sep, Dec, Mar,</td>
<td>100% Pass</td>
<td>Class of 1999</td>
</tr>
<tr>
<td>Medical alerts</td>
<td>Clinics,</td>
<td>Jun/D3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facial proportions, esthetics</td>
<td>Jul, Oct, Jan,</td>
<td></td>
<td></td>
<td>Passed as of to complete &amp; pass</td>
</tr>
<tr>
<td>Dental alignment &amp; symmetry</td>
<td>Apr/D3</td>
<td></td>
<td></td>
<td>4/30/99 all assignments</td>
</tr>
</tbody>
</table>
### Treatment Plan

<table>
<thead>
<tr>
<th>Task Description</th>
<th>Phase/Location</th>
<th>Dates</th>
<th>Pass Rate</th>
<th>Class of Year</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>c. Assess treatment progress on a spectrum of patients in orthodontic treatment</td>
<td>Chairside case review in:</td>
<td>3rd Year</td>
<td></td>
<td></td>
<td>Students have</td>
</tr>
<tr>
<td>Function/habits</td>
<td>206 Ortho</td>
<td>Sep, Dec,</td>
<td>100%</td>
<td>Class of 1999</td>
<td></td>
</tr>
<tr>
<td>Dental &amp; gingival health</td>
<td>Clinics, Jun/D3</td>
<td>Jun 98: 26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facial proportions, esthetics</td>
<td>Jul, Oct, Jan, Apr/D3</td>
<td>Passed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anteroposterior relationships</td>
<td></td>
<td>4/30/99</td>
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<tr>
<td>Vertical relationships</td>
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<tr>
<td>Transverse relationships</td>
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<tr>
<td>Dental needs</td>
<td></td>
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<tr>
<td>Orthodontic needs</td>
<td></td>
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</tr>
<tr>
<td>d. Fabricate and adjust a removable active appliance for anterior crossbite correction</td>
<td>Fabricate Z-springs Ortho lab in</td>
<td>Sep, Dec,</td>
<td>100%</td>
<td>Class of 2000</td>
<td>Remedial instruction; re-examine</td>
</tr>
<tr>
<td>Fabricate finger-springs</td>
<td>Jul, Oct, Jan, Jun/D3</td>
<td>Mar 98: 26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fabricate Adams clasps</td>
<td>Apr/D3</td>
<td>Passed</td>
<td></td>
<td></td>
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<tr>
<td>Fabricate ball clasps</td>
<td></td>
<td>Passed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acrylic (post, biteplane)</td>
<td></td>
<td>Passed</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Activate appliance and treat malocclusion</td>
<td></td>
<td>Passed</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>e. Fabricate fixed limited appliance for molar uprighting</td>
<td>Band lower 7,5,4,3</td>
<td>Ortho lab in</td>
<td>Sep, Dec, Mar,</td>
<td>100% Pass</td>
<td>Class of 2000</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
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<td>-------------</td>
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</tr>
<tr>
<td>Place passive lower</td>
<td>Jul, Oct, Jan,</td>
<td>Jun/D3</td>
<td>Sep, Dec, Mar 98:</td>
<td>42 of 60 Passed</td>
<td>by 30 June 1999</td>
</tr>
<tr>
<td>stabilization wire segment</td>
<td>Apr/D3</td>
<td>42 of 60 Passed</td>
<td>by 30 June 1999</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place lower uprighting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>spring</td>
<td></td>
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<tr>
<td>Remove bands and clean</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>typodont</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>f. Fabricate a removable Hawley appliance</th>
<th>Design removable upper &amp;</th>
<th>Ortho lab in</th>
<th>Sep, Dec, Mar,</th>
<th>100% Pass</th>
<th>Class of 2000</th>
<th>Remedial instruc-</th>
</tr>
</thead>
<tbody>
<tr>
<td>fixed lower retainer</td>
<td>Jul, Oct, Jan,</td>
<td>Jun/D3</td>
<td>Sep, Dec, Mar 98:</td>
<td>42 of 60 Passed</td>
<td>by 30 June 1999</td>
<td></td>
</tr>
<tr>
<td>Fabricate upper Hawley</td>
<td>Apr/D3</td>
<td>42 of 60 Passed</td>
<td>by 30 June 1999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>retainer (wires, acrylic)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>g. Fabricate a fixed bonded retainer</th>
<th>Design removable upper &amp;</th>
<th>Ortho lab in</th>
<th>Sep, Dec, Mar,</th>
<th>100% Pass</th>
<th>Class of 2000</th>
<th>Remedial instruc-</th>
</tr>
</thead>
<tbody>
<tr>
<td>fixed lower retainer</td>
<td>Jul, Oct, Jan,</td>
<td>Jun/D3</td>
<td>Sep, Dec, Mar 98:</td>
<td>42 of 60 Passed</td>
<td>by 30 June 1999</td>
<td></td>
</tr>
<tr>
<td>Adapt passive lingual</td>
<td>Apr/D3</td>
<td>42 of 60 Passed</td>
<td>by 30 June 1999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lower 3-3 retention wire</td>
<td></td>
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</tbody>
</table>

**STANDARD 2-25M: ORTHODONTICS**

_Last Updated on 7/24/99_
Members of the Foundations of Restorative Science & Technology committee:
Gordon Douglass (Chair), David Graham and Fritz Finzen

GOAL:
To teach the biological basis, science, techniques and psychomotor skills necessary to restore missing portions of the masticatory system to appropriate form, function and esthetics.

DISCUSSION:
Developing a high level of psychomotor skills remains an important goal of dental education, and this stream assumes the primary responsibility for developing those psychomotor skills most fundamental to the restoration of teeth. The use of dental instrumentation and materials to properly prepare and restore a part or all of the dentition is still a major part of a contemporary practice in general dentistry.

The committee began by making the assumption that beginning dental students at UCSF have not yet developed a level of psychomotor skills adequate for the general practice of dentistry. It has, therefore, worked to structure this stream as a progression from clinical procedures requiring minimal skill levels and minimal invasion of tooth structure, to those requiring more extensive preparations and reconstructions. Since restorations may be either fixed or removable or a combination, this stream must also vertically integrate both types of restorations.

SUBJECTS:
The foundations of restorative dentistry fall into two categories: fixed restorations and removable restorations.

FIXED RESTORATIONS

The committee used all available course materials now being used in restorative dentistry to identify and then coordinate the following "units" of information with respect to each competency as noted below.
**Competency 1:** *Restore tooth defects which warrant minimally invasive procedures.* *(NOTE: competency in this context is NOT meant to have the same meaning as those discussed in the Patient Centered Care Stream).*

The types of dental lesions within the competency include: defective pits and grooves, smooth surface enamel defects and carious lesions, and erosions, abrasions, abfractions.

*(NOTE: the use of the term "unit" below does not imply a unit of instruction (i.e., one lecture a week for a quarter) but rather a section or a body of instruction)*

UNIT 1: What dental defects require restoration? Identification and classification of lesions


UNIT 3: Lecture material and handouts on the restoration of abfractions (placement and finishing)

UNIT 4: The restoration of abfractions

UNIT 5: Biomechanical principles of cutting tooth structure

UNIT 6: Lecture material and handouts on conservative restorations requiring the removal of tooth structure. Laboratory would follow with preparation and placement of preventive resin restorations, attrition, erosion/abrasion.

UNIT 7: Conservative Class I slot and Class II box bonded amalgam restorations. Lecture of one hour then to laboratory to perform procedure (video tape?).

Biomaterials lectures need to be brought in at this time to cover the material to date.

---

**Competency 2:** *Place direct restorations for tooth defects requiring the replacement of significant tooth structure.*

The types of dental lesions within the competency include: fractured teeth, carious lesions
requiring enhanced retention and resistance form, replacement of defective traditional restorations and recurrent caries.

UNIT 8: Introduce material on the place of "conservative" and "traditional" in modern dental health care. Laboratory to follow with VCR tape of procedures to be accomplished ("Learn-a-Prep", Class I & 5 amalgam/composite preparation [same prep!] on typodont).

UNIT 9: Cavity (intra and extracoronal) preparations. Nomenclature, and instrumentation (rotary and hand) of cavity preparation. Laboratory: Class III composite and class IV composite preps.

UNIT 10: Outline form (VCR tape-class II prep). Laboratory: Class II amalgam prep on Learn-a-Prep and typodont

UNIT 11: Convenience retention and resistance form. Laboratory: another Class II amalgam prep

UNIT 12: Caries removal and pulp protection. Laboratory: Variations of Class II preparation for large restorations.


UNIT 14: No lecture planned yet. Laboratory: Amalgam preparation (test case?).

Consider a lecture on the commonalities of materials placement such as the use of matrices.

COMPOSITE BLOCK:

Preliminary discussions have been completed but more time must be spent to plan this block of time. Key players: Lacy, Staninec and Eakle

AMALGAM BLOCK:

UNIT 15: Class I amalgam outline, trituration, condensation, carving of amalgam. Laboratory: #30 occlusal amalgam preparation, condense and carve amalgam three times.

Biomaterials lectures need to be brought in at this time to cover the material to date.

UNIT 16: Class II amalgam preparations (bis and molar outlines), Sweeney matrix, condensation and carving. Laboratory: #30 MO amalgam preparation, Sweeney matrix,
condensation and carving.

UNIT 17: Selection of spherical or lathe cut amalgam, finishing and polishing. Laboratory: tooth #5 DO, Sweeney matric, condense and carve. Finish and polish #30 from previous period.

UNIT 18: Lecture is VCR tape reviewing the process of Class II amalgam prep, matrix and carving. Laboratory: (test case of Class II amalgam prep, Sweeney matrix condense and carve?)


UNIT 20: Class V and VI outline and instrumentation. Laboratory: #29 & 30 facial amalgam preps condense and carve. Finish and polish #21 & 29.

UNIT 21: Problem solving. Laboratory: Test case: Class II amalgam preparation, Tofflemire matrix, condensation and carve.

UNIT 22: Class III amalgam preparation, VCR tape on the "60 Minute’s" tape on amalgam controversy. Laboratory: DL amalgam prep, modified Sweeney matrix, condense and carve. Second DL amalgam prep, Tofflemire matrix, condense and carve. Finish and polish #29 & 30 Class Vs.

UNIT 23: Extracoronal amalgam preps. Laboratory: #30 MODL prep, spot welded matrix, condense and carve. Finish & polish class III amalgam.

UNIT 24: 20-20 rebuttal to amalgam controversy. MODL plus amalgam #3, spot welded matrix, condense and carve. Finish and polish #30.

Competency 3: Place indirect restorations for tooth defects which requiring the replacement of significant tooth structure (will be integrated with the composite indirect techniques).

UNIT 25: Lecture: Basic principles of tooth preparations to receive indirect intracoronal restorations (composites, castings). Laboratory: preparation of #3 MO inlay.

UNIT 26: Lectures: Basic principles of tooth preparations to receive full veneer castings and the provisionalization of prepared teeth. Laboratory: preparation and temporization of #18 FVC.

UNIT 27: Lectures: "Lost wax technique" and its use in fabricating a casting (should include impression, waxing, investing and casting). Laboratory: complete acceptable preparations of #3
inlay and #18 FVC and temporize.

UNIT 28: Lecture: How to make and pour a quadrant impression and prepare a die for waxing of a restoration. Laboratory: Making an impression and preparing a die.

UNIT 29: Lecture: Biomaterials of the "lost wax technique" (waxes and investments). Laboratory: waxing of #3 inlay (direct technique) and FVC #18 (indirect).

UNIT 30: Lecture: How to prepare a wax pattern for casting (to include margin re-adaptation, spruing and investing). Laboratory: invest the #3 inlay wax pattern for casting, and finish waxing # 18 FVC.

UNIT 31: Lecture: The casting process. Laboratory: Casting of the #3 inlay, and invest and cast #18 FVC.

UNIT 32: Lecture: Finishing of a casting to a die. Laboratory: Finishing and polish of #18 casting.

UNIT 33: Laboratory: #2 FVC preparation and temporization.

UNIT 34: Lecture: Principles of partial veneer preparations for restorations that rely solely on bonding for retention on teeth with existing restorations or defects. Laboratory: PVC prep (for porcelain veneers) on 8 & 9, impression and temporaries

UNIT 35: Lecture: Principles of partial veneer preparations for restorations that rely on mechanical retention and resistance form for teeth with existing restorations or defects. Laboratory: #30 PVC prep (student designed prep based on principles given in lecture), quadrant impression and temporization.

UNIT 36: Laboratory only: Wax and invest, cast and finish #30.

UNIT 37: Laboratory: Student designed 7/8 crown prep on tooth #14 and PVC prep on #4 based upon principles of PVCs and temporization. (no waxing or casting intended)

UNIT 38: Lecture: Types of impressions and how to decide which to use (full arch vs quadrant and mounting techniques).

UNIT 39: Lecture: Biomaterials, what and how to use luting agents Physical properties and rationale for clinical selection in the use of luting agents.

UNIT 40: Cementation and finish of inlay, FVC and PVCs.
**Competency 4:** *Restore missing posterior teeth with fixed partial dentures.*

UNIT 41: Lecture: Preparation and provisional restorations for posterior cast restorations. Laboratory: Pretreatment waxing and preparation of the cast for the provisional.

UNIT 42: Lecture: Preparation design for posterior bridges. Laboratory: Preparation of teeth #3 (PVC) and #5 (PVC).

UNIT 43: No Lecture. Laboratory: Complete bridge preps #3 and #5

UNIT 44: Lecture: Provisional restoration and impressions for posterior bridges. Laboratory: Complete bridge preps.

UNIT 45: No lecture. Laboratory: prepare custom tray, make impressions for bridge, and make jaw relation records.


UNIT 47: No Lecture. Laboratory: Finish mounting of casts, trimming dies and begin waxing of bridge retainers.

UNIT 48: No Lecture. Laboratory: Complete waxing of bridge.

UNIT 49: Lecture: Pontic design. Laboratory: Cutting of key way, investing, casting of #5.

UNIT 50: Lecture: Resin veneers for pontic contours, and fixed partial denture assembly. Laboratory: Seat #5 casting and wax #4 attachment in #5, invest and cast #3 and #4.

UNIT 51: No lecture. Laboratory: Complete posterior bridge.

**Competency 5:** *Restore missing anterior teeth with fixed partial dentures.*

UNIT 52: Lecture: Preparation and provisional for anterior bridge #8 - #10. Laboratory: preparation of teeth #8 - #10
UNIT 53: Lecture: Biomaterials of investments for porcelain to metal restorations. Laboratory: Complete preparation of #8 - #10 bridge and start provisional.

UNIT 54: Lecture: Biomaterials of alloys used for porcelain to metal restorations. Laboratory: Complete provisional bridge.

UNIT 55: Lecture: Framework design and casting of porcelain to metal restorations. Laboratory: Cut back wax pattern, invest and cast.

UNIT 56: Lecture: Finishing of metal for the application of porcelain and the application of opaque porcelains. Laboratory: Finish metal and apply opaque porcelain.

UNIT 57: Lecture: Modification of porcelain opaques and the application of body porcelains, finish and glazing. Laboratory: Porcelain application and contouring.

UNIT 58: Lecture: Variations of porcelain to metal restorations. Laboratory: Complete anterior bridge.

UNIT 59: Lecture: The build-up of vital posterior teeth (auxiliary retention and resistance form). Laboratory: Pin, troughs, grooves, boxes, pulpal protection and their use in the building up vital posterior teeth. Laboratory: Pulpal protection, and the pin and trough retained bonded amalgam restoration.


UNIT 61: Lecture: Pre-endodontic protection and provisionalization of posterior teeth.

Laboratory: The use of bands, amalgam, composites for pre-endodontic treatment of posterior teeth.

UNIT 62: Lectures: The preprosthetic build-up endodontically treated teeth. Laboratory: Direct and indirect cast dowel and core, and fiber reinforced resin post and core. Consider a debate on the issue of cast vs. fiber reinforced dowel and core.


**Competency 6: Restore severely compromised vital and non-vital teeth.**

UNIT 64: Lectures: The preprosthetic build-up of endodontically treated posterior teeth. Laboratory: Amalgam build-up utilizing the canal space.

REMOVABLE RESTORATIONS:

The following "subject units" encompass existing courses RD 121A, 125.01A, 121B, 125.01B, 121C, and 125.01C.

**Competency 7: Fabricate complete dentures for a completely edentulous patient.**

Introduction to the theory, clinical practice, and laboratory procedures for the fabrication of complete dentures

UNIT 1: Lecture: Introduction to complete dentures. Laboratory: Make record bases using Orthodontic resin and the Triad materials.

UNIT 2: Lecture: What it means to be edentulous. Laboratory: Using the Hanau 183 Wide View Articulator.

UNIT 3: Lecture: Anatomy and Physiology of Complete Dentures. Laboratory: Mounting edentulous casts

UNIT 4: Lecture: Biomechanics of Complete Dentures and Edentulous Impressions. Laboratory: Make occlusal plane guide.

UNIT 5: Lecture: Recording Maxillomandibular Relations and Setting Anterior Teeth. Laboratory: Setting anterior teeth.

UNIT 6: Lecture: Tooth Selection and Arrangement. Laboratory: Setting posterior teeth.

UNIT 7: Lecture: Alternate Occlusal Forms and Relationships. Laboratory: Wax contouring of complete dentures.

UNIT 8: Lecture: Processing, Delivery and Adjustment. Set up case for processing.

**Competency 8: Fabricate tissue borne complete and partial dentures for patients transitioning into partial and complete edentulism.**
Introduction to the theory and fabrication of stayplates, transitional and immediate dentures.

UNIT 9: Lecture: The Lingualized Occlusal Concept. Laboratory: Remounting of complete dentures, the remount index, and placing of names in denture bases.

UNIT 10: Lecture: The Use of Stayplates (Mucosa Borne Removable Partial Dentures). Laboratory: Make a stayplate.

UNIT 11: Lecture: Transitional Complete Dentures and Tissue Conditioners. Laboratory: Add tooth wire clasps to a stayplate.

UNIT 12: Lecture: Immediate Complete Dentures. Laboratory: Repair of broken dentures.

UNIT 13: Lecture: Complete Denture Relining. Laboratory: Replace broken or lost denture teeth.

UNIT 14: Lecture: The Theory and Use of Overdentures.

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**Competency 9:** Restore the partially edentulous patient with a tooth and tissue borne removable partial denture.

Introduction to the basic principles of partial denture design and fabrication.


UNIT 16: Lectures: Designing and Work Authorizations for Removable Partial Dentures. Laboratory: Design RPDs for the most common clinical presentations.

UNIT 17: Lectures: Direct and Indirect Retainers for Removable Partial Dentures. Laboratory: RPD set-up, wax contours.

UNIT 18: Lectures: Alloys Used to Fabricate Removable Partial Dentures and Processing of RPDs. Laboratory: Set-up RPD for processing.

Scientific Method and Clinical Dentistry Stream
Stream Leader: Hilary Pritchard
Stream Committee Members: Gary Armitage and Stuart Gansky

Goals:

1. Equip students to be enthusiastic lifelong learners
2. Prepare students to assess scientific basis for clinical treatment (assess the worth of scientific information and apply it in solving clinical problems)
3. Provide vertical integration among streams
4. Demonstrate and give experience in the integration of basic and clinical sciences
5. Learn to develop and apply appropriate criteria to achieve reliable self-assessments and peer assessments.

Summary of recommended changes:

Proposal is to add a series of new activities, estimated to require approximately 4 hrs/week, on average, (two hrs/wk in small group sessions, 2 hrs/wk in unstructured library study) throughout the 4 years of the DDS program.

THE SCIENTIFIC METHOD AND CLINICAL DENTISTRY
DRAFT: 5 April 1999

STATEMENT:

At the conclusion of this stream of the curriculum, the competent student will be able to locate, understand, analyze, judge, and apply evidence from scientific studies to solve clinical problems and improve patient care. In addition, the competent student will be able to develop and apply appropriate criteria to achieve reliable self-assessments and peer assessments.

YEAR 1:
Prefall/Fall:

The Scientific Method in Clinical Dentistry, I

Outcome: By the end of the first year, students will be highly skilled in the techniques used to search, retrieve, analyze, and critically evaluate the scientific literature (including journals such as Science, Nature, Cell, JAMA, NEJM, in addition to the dental literature).

Structure: This 2 unit course will consist of 2 two-hour sessions per week, including weekly small group
workshops over the course of the prefall/fall quarter. One two-hour block is set aside for students to study independently, and is intended primarily for work in the library. The fourth hour provides time for students to meet with other members of their group to plan assignments and discuss findings.

Meetings: A one-hour session for the entire class will introduce the course, including the objectives and how the process will work. All other meetings will be facilitator-led sessions in 10 small groups of 8 students each. Periodically, 2 groups will meet together with both facilitators (one basic scientist, one clinician).

Structure: Students will meet in small groups of 8 for workshop sessions overseen by a faculty facilitator from either the basic sciences or the clinical sciences.

Facilitators will work in paired teams (1 basic scientist + 1 clinical scientist working with 2 groups of students), trading groups and sometimes meeting jointly as the term progresses. Every third or fourth week, the two groups will meet together with both facilitators. The purpose of this combined format is twofold. First, it offers an opportunity for faculty in the other four streams to participate, thus strengthening the vertical integration of courses taught concurrently. Second, it stresses the inherent connections between the scientific method and clinical dentistry by assuring that every student (and every facilitator) has the opportunity to see different perspectives at work and to assess the strengths of each. By working cooperatively, the facilitators in the team can demonstrate how the strengths of each perspective can be integrated by applying the scientific method when making clinical judgments.

Purpose and Content: In the prefall/fall term (assumed to consist of 14 weeks of classroom activity, as now), sessions will be designed to give students experience in applying what they have learned to solve practical problems of increasing complexity. One way to approach this would be through a clinical mega-case, which students would revisit periodically over several years, investigating questions and clinical problems of increasing complexity. We have discussed several possibilities; for example, one class might start off with diabetes (or another complex disease affecting several organ systems), by asking students why, as dental students, they are being asked to learn about diabetes. To address the question, students would be expected to learn how to search online sources such as Medline and compose a search strategy including diabetes and oral health (and other combinations of similar terms). We would expect them to find half a dozen reasons why dentists need to know about diabetes.

As the year progressed, in other assignments, students might be asked to retrieve particular kinds of studies (e.g. randomized controlled clinical trials, crossover trials), which would require them first to learn about these study designs and recognize them in their reading. Students would be asked to discuss how the various designs work, as well as their restrictions or limitations, and arrive at the best fit between design and hypothesis, together with the rationale for their conclusions. Students will also be asked to analyze individual studies and judge the reliability and strength of their results. Other assignments might be designed to demonstrate normal versus skewed distribution within a population, and students asked to discuss and demonstrate how these differing distribution patterns affect sampling methods and subsequent analysis of data.

As the term progresses, the workshop problems would become more challenging and complex, but still be designed to demonstrate relatively clear-cut choices that can be logically supported by what students have learned. The subject matter from which the problems are constructed would be suggested by instructors from the other four streams, so that students have the opportunity to apply the methods they are learning in this stream to the material being discussed in other courses. These connections will be strengthened by the participation of instructors from the other streams, and by the meetings conducted jointly by the basic and clinical facilitators every third or fourth week.
Assessment: A comprehensive examination for this stream at the end of the fall might consist of students defending one of a pair of papers selected to contrast a sound, well-reasoned study versus another study lacking these qualities. The test would be an essay of limited length (perhaps 750-1000 words, 3-4 typewritten, double-spaced pages), and each essay would be read and first graded independently by both members of the faculty team, who would then confer to arrive at a consensual grade for each of the 16 papers in their two groups. This would allow a balanced review of each student’s work without placing an undue burden on any individual faculty member, as each would read and grade 16 essays. All participating facilitators would be expected to meet initially (and periodically throughout the quarter, as needed) to agree on standards for judging the essays, and the standards would be expected to reflect the principles taught and applied over the course of the quarter.

Interim assessments and the final course grade might incorporate some or all of the following:

1) Self-assessments and peer assessments: To become competent, enthusiastic lifelong learners, students need to learn and practice reliable self-assessment. This stream offers opportunities for students to practice both peer and self-assessments and assess their reliability by comparing their assessments with those of their peers and the facilitators. Students might begin by working together to define consensual criteria for these assessments (e.g. appropriate measures for assessing the quality and quantity of effort). Assignments might include short essays on an assigned topic, which would then be critiqued (written critique of 200-250 words) by another student. Both the student’s own essay and the student’s critique of another’s essay could be assessed by faculty facilitators and reflected in the course grade.

2) Group dynamic: Students will be expected to work together effectively as a team and to participate in tasks such as dividing work equitably among members, being accountable to the group, and weighing different kinds of contributions. Students and facilitators may develop different models for evaluating and comparing the effort and participation of individual members within their groups. At a minimum, however, the facilitators must be able to identify group members who are falling behind or failing to keep pace so that appropriate corrective interventions can be planned.

3) Individual assessments: More traditional methods (e.g. essays, responses to questions, performance on quizzes and exams) can be used to assess the performance of individuals. Individual assessments will also reflect the demonstrated reliability of self-assessments and results of peer assessments throughout the course.

Winter/Spring:

The Scientific Method in Clinical Dentistry, II. In the winter and spring quarters, the course would continue as a directed reading course, meeting every week to discuss papers selected by the facilitators. Again, participation and periodic combined meetings that showcase both the expertise of basic and clinical science facilitators might prove the most productive approach.

As the course progresses, articles would be chosen to demonstrate more contentious and ambiguous issues, such as those where the available evidence is open to several interpretations, where no convincingly strong evidence exists, or where ethical dilemmas preclude straightforward studies. In the final weeks, students would be examining issues for which there is little or no sound evidence, where rigorous studies provide conflicting outcomes that cannot be reconciled without further investigation, and where ethical considerations complicate study design.
Assessment: A comprehensive final examination for the entire course sequence over the first year might consist of a take-home final exam where students are asked to propose an investigation of a clinically relevant problem or question (following the basic format of an Academic Senate grant proposal). They would be asked to state the problem that initiates the study, summarize the background and significance of the question, describe the working hypothesis, propose a study design (including appropriate methods for collecting and analyzing the data, although they would not be expected to produce preliminary data), define parameters for success or failure of the study, and discuss the limitations of the proposal. These essays (again, with a set maximum length) would be read by paired teams of faculty and graded as described above; in addition, each student could be asked to read and submit a critique of another student’s proposal to add the dimension of peer assessment to the final grade.

References and Resources:

Our working group read and considered three books that could be useful in mastering the basic skills in the first year of this stream. The book we thought would be most useful was How to Read a Paper by Trisha Greenhalgh (BMJ Publishing Group, 1997).

Much of the content of this book is available on the web. If you would like to review it, the URL is http://www.ucl.ac.uk/primcare-popsci/uebpp/uebpp.htm#how.
<table>
<thead>
<tr>
<th>Goal</th>
<th>Method</th>
<th>Mechanism</th>
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<tbody>
<tr>
<td>Integration of basic and clinical sciences</td>
<td>Early introduction to scientific method</td>
<td>Assign progressively more complex series of clinically relevant problems to be investigated by students</td>
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<tr>
<td>Integration of course</td>
<td>Small group instruction using faculty partnerships</td>
<td>Pairs of instructors (1 basic scientist, 1 clinician) meet jointly with their student groups to review findings, share any differences</td>
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<td></td>
<td>Course content organized around multidisciplinary</td>
<td>Faculty partners also work together in assessments and grading of students in both groups</td>
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<td>Topics and problems developed by team of multidisciplinary faculty participants</td>
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<td>Faculty participants from other streams working together to develop topics and problems for the</td>
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<tr>
<td>content and instruction across traditional disciplines</td>
<td>topics, clinical problems</td>
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<tr>
<td>Vertical integration of courses within academic terms</td>
<td>Contributions for SMCD content and instruction sought from faculty teaching concurrent courses in other streams</td>
<td>Continuity and linkage provided with material already presented, adding new knowledge, developing complexity (e.g. mega-case revisited)</td>
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<tr>
<td>Appropriate reinforcement and development of knowledge and skills over time (horizontal integration)</td>
<td>Oversight and team approach implemented by director of the SMCD stream</td>
<td>Small group discussion of need for accurate self-assessment, appropriate criteria, referencing to peer and faculty assessments</td>
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<tr>
<td>Accurate self-assessment</td>
<td>Self-assessments included as part of graded exercises; comparisons with peer and faculty assessments for accuracy</td>
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## PROPOSED CURRICULUM REVISION: DENT 1

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<th>Spring</th>
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Notes & Questions:

* indicates current activity assumed to fall within this stream (CDC courses)

** In the Foundations stream, hours indicate current assignment to Rest Dent courses, but NOT INCLUDING MORPHOLOGY

Should current hours assigned to dental morphology (4 hrs/wk in fall, 10 hrs/wk in winter, 4 hrs/wk in spring) be included in Dental Sciences or Foundations stream?

In the Foundations of Restorative stream, should the Intra-arch Restorations activities in winter and spring be viewed as separate courses, or different activities within the same course?

Last Updated on 7/24/99

By Peter B. Sargent