I. Advanced Studies Committee
Dean Loeser charged the committee to address the following questions:

1. What is the state of the art nationally with regard to 4th year learning?
2. What is the role of the 4th year of medical school?
3. How do we best prepare our students for internship and residency?
   1. Is there value in our Tier structuring of 4th year courses?
   2. If so, have we correctly categorized courses into their proper Tiers?
4. Thinking about Pathways to Discovery and possible structural innovations for the UME to GME transition:
   1. What is the correct balance of structure and freedom with respect to core requirements and self-motivated learning?
   2. How can we make more effective use of a largely wasted spring quarter? Should we alter the timing of Coda, our capstone course now scheduled for the very end of the year?
5. How would you design a 4th year that followed a 3-year curriculum that integrated all the core clinical teaching and the fundamental sciences from the outset of medical school?

Members of the committee represented a broad spectrum of Med4 stakeholders (Table 1). The committee met ten times between November, 2008 and September 2009. Smaller working groups met in advance of committee meetings. The committee as a whole actively participated in the 2009 Medical School Education Retreat.

<table>
<thead>
<tr>
<th>John Q. Young, MD, MPP, Chair Associate Director, Psychiatry Residency Training</th>
<th>Madhavi Dandu, MD Co-director, Global Health Pathway Mike Harper, MD Chair, CSSC Associate Professor, Medicine Helen Loeser, MD, MSc Associate Dean, Curricular Affairs Pamela Lyss-Lerman, MD Resident, Department of Psychiatry John Maa, MD Assistant Professor, Surgery Co-Director, Coda</th>
<th>Maureen Mitchell Clinical Studies Specialist Brian Niehaus, MD Class of 2009 Bridget O’Brien, PhD Assistant Professor, Medicine Office of Med Ed John Stein, MD Advisory College Mentor Assistant Professor, Emergency Medicine Arianne Teherani, PhD Assistant Professor, Medicine Director of Program Evaluation Sandrijn VanSchaik, MD, PhD Assistant Professor, Pediatrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kristen Fitzhenry, EdM Curriculum Information Officer Josh Adler, MD Professor, Medicine Director, Pathways to Discovery Alexis Armenakis Class of 2009 UCSF Intern, Psychiatry Renee Courcy Pathways to Discovery David Daikh, MD, PhD Associate Professor, Medicine Assistant Professor, Medicine</td>
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<tr>
<td>Mike Harper, MD Chair, CSSC Associate Professor, Medicine</td>
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</tr>
</tbody>
</table>
II. Med4 in Context

Mission of UCSF School of Medicine. The educational mission of UCSF School of Medicine is to prepare medical students from diverse backgrounds for excellence and leadership in patient care, research, education and public service.

Overview of current curriculum. UCSF medical students commence with the 18-month Essential Core, a series of 7 interdisciplinary block courses complemented by the longitudinal Foundations of Patient Care course. In the spring of year 2, students embark on the Clinical Studies, which consists of the third-year core clerkships and fourth-year rotations. Throughout, the curriculum emphasizes student-directed learning, connections across disciplines, and competency-based advancement. From the first day, students also have rich opportunities to explore areas beyond the core curriculum and to engage in in-depth training and inquiry in areas such as basic or clinical research, community and global health, and medical education, through the innovative Pathways to Discovery Program.

Pathways to Discovery (PTD). Launched in 2008, the PTD program fosters the pursuit of discovery, inquiry, and innovation as part of the career of every health professional trained at UCSF. Trainees are provided with opportunities for in-depth study and experience in one of several areas of inquiry that go beyond the routine practice of health care. Each pathway includes: 1. curricula designed to prepare learners for innovation in specific areas; 2. a mentored project; and 3. the creation of a legacy of lasting value to UCSF and broader communities. The program principles for PTD are:

A. Pathways will promote the advancement of discoveries, inquiries, and innovations that lead to improvements in human health.
B. Each pathway includes a rigorous course of study and requires a substantial commitment from trainees.
C. The pathways program is available to professional and graduate students from all four professional schools, to residents, and to clinical fellows.
D. Mentoring of trainees is a key component of the pathways program
E. Pathways had been designed to streamline additional time required in training.
F. The Pathways to Discovery program is an elective program and participation is voluntary

Competency-Based Advancement. UCSF’s medical curriculum provides a set of educational experiences designed to support students’ mastery of the core knowledge, skills, and attitudes needed to achieve their goals as physicians, researchers, teachers, and public servants. This core set of knowledge, skills, and attitudes has been organized into the same set of competencies adopted by the Accreditation Council for Graduate Medical Education (ACGME). Throughout the UCSF curriculum, medical students’ achievement of specific, required competencies is assessed through a variety of methods that include written and laboratory practical examinations,
structured clinical examinations, instructor and peer assessments, and self-reflection exercises. UCSF is in the process of developing a set of tools students can use to create a “learning portfolio” that helps document their achievement of expected levels of competency and that supports their work with mentors to map out an individualized learning plan. The following (Table 2) is a list of the program objectives for the UCSF doctor of medicine curriculum.
| Patient Care | 1. Demonstrate confidence and comfort with the primary provider role and the provision of longitudinal care  
2. Gather complete and focused histories in an organized fashion, appropriate to the clinical situation and patient language ability  
3. Conduct relevant, complete and focused physical examinations  
4. Document encounters efficiently and concisely  
5. Manage and prioritize patient care tasks for a group of patients  
6. Anticipate patients’ needs, participate in discharge planning, and create individualized disease management and/or prevention plans including patient self-management and behavior change  
7. Perform common procedures and alleviate patients’ pain associated with procedures  
8. Follow universal precautions and sterile technique |
| Medical Knowledge | 1. Recognize the central importance of discovery, understand the scientific foundations of medicine, and apply that understanding to the practice of evidence-based medicine  
2. Engage in clinical reasoning to solve clinical problems  
3. Demonstrate an understanding of normal development from the molecular to the socio-cultural levels  
4. Demonstrate an understanding of the pathophysiology of human disease at molecular, cellular, systems, and whole organism levels  
5. Demonstrate an understanding of how physical, psychological, sociological, cultural, and environmental processes contribute to the etiology, pathogenesis, and manifestations of human health and disease  
6. Demonstrate an understanding of the natural history of illness and strategies for promoting health and preventing illness |
| Practice-Based Learning & Improvement | 1. Use information technology to access online medical information, manage information, and assimilate evidence from scientific studies  
2. Appraise evidence from scientific studies related to individual patients’ health, and apply knowledge of study design and statistical methods to the appraisal of clinical studies  
3. Understand basic epidemiologic terms for describing disease patterns, and use knowledge of disease patterns to assess the value of diagnostic tests based on patients’ risk of disease  
4. Facilitate learning of colleagues and the health care team  
5. Understand the value of systematically evaluating one’s own performance and practice  
6. Analyze one’s own academic performance and develop individualized plans for improvement |
| Interpersonal & Communication skills | 1. Establish a collaborative and constructive doctor-patient relationship with patients  
2. Effectively and empathically discuss serious, sensitive, or difficult topics with patients  
3. Elicit and begin to address patients’ needs and preferences and incorporate them into the management plan  
4. Share relevant, understandable information with diverse patients  
5. Work with families and/or caregivers to negotiate patients’ care  
6. Present information in organized logical fashion appropriate for the clinical situation, including assessment and plan |
### Table 2: Learning Objectives, UCSF School of Medicine

| Professionalism | 1. Demonstrate commitment to excellence and personal/professional development, through ongoing self-directed learning and self reflection  
2. Show insight into their own personal and professional development  
3. Be sensitive and responsive to culture, race/ethnicity, age, socioeconomic status, gender, sexual orientation, spirituality, disabilities, and other aspects of diversity and identity  
4. Be responsive to the needs of patients and society, superceding self-interest  
5. Advocate for patients, their families, and their communities  
6. Practice ethically, including maintaining patient confidentiality, obtaining appropriate informed consent, responding to medical errors, and understanding principles of ethical research and conflicts of interest  
7. Show commitment to caring for and advocating for the underserved and/or those populations disproportionately affected by disease  
8. Promote their own and their colleagues' professional development through effective feedback  
9. Show respect, compassion, and integrity while interacting with diverse patients, families, and other health professionals  
10. Show accountability and dependability in interactions with patients, families, and other health professionals |
| Systems-Based Practice | 1. Identify different types of medical practice and delivery systems, and navigate within different health care systems and teams  
2. Understand the health care system and recognize ways to assess and improve health care and reduce medical errors, and apply to a specific clinical scenario  
3. Understand basic principles of health care finance, how methods and costs affect health care delivery, and methods and incentives for controlling costs  
4. Identify methods for evaluating cost-effectiveness of care, and apply a method to a clinical experience or setting  
5. Advocate for quality patient care |

1. As of September 1, 2009. The UCSF School of Medicine learning objectives are frequently updated and will likely be modified in the near future in light of planned curricular reforms and the LCME site visit.
3+1 as Future Context. The Medical School has launched a change process that aims to replace the current “2+2” curriculum with a “3+1” curriculum, i.e., a 3 year longitudinal clinical curriculum with the basic sciences integrated throughout that ends with sub-I equivalent experiences followed by Med4 or the “1” in “3+1”. The current target date for this change is September, 2012.

California Medical Board licensing regulations. State regulations constitute an additional important context for curricular reform. The following current regulations (as of September, 1, 2009) that potentially impact Med4 include:

1. A medical curriculum must extend over a period of at least four academic years, or 32 months of actual instruction;
2. The total number of hours of all courses shall consist of a minimum of 4,000 hours. At least 80 percent of actual attendance shall be required.
3. Instruction in the clinical courses shall total a minimum of 72 weeks in length.
4. Instruction in the core clinical courses of surgery, medicine, family medicine, pediatrics, obstetrics and gynecology, and psychiatry shall total a minimum of 40 weeks in length with a minimum of eight weeks instruction in surgery, eight weeks in medicine, six weeks in pediatrics, six weeks in obstetrics and gynecology, a minimum of four weeks in family medicine, and four weeks in psychiatry.
5. 54 weeks shall be performed in a hospital that sponsors the instruction and shall meet one of the following.

III. Current Med4 Requirements: MS4s are required to complete at least 24 weeks of “Advanced Clinical Work”, 17 weeks of “Discretionary Work”, and the Coda course.

Advanced Clinical Work. MS4s must complete at least 24 weeks of advanced clinical work. All advanced clinical rotations are required to possess:

A. Rigor and substance
B. Clinical content
C. Explicit learning objectives
D. Learning plan
E. Appropriate assessment of student mastery
F. Core as prerequisite
G. Significant role in preparing students for graduation as well-rounded physicians and prepared interns

Advanced clinical work electives are categorized into 3 tiers: 1A, 1B, and 2. Table 3 contain the definition of each tier. The 24 weeks must include the following:
A. at least 8 weeks of Tier 1A, including 4 weeks of either Med 140.01 (internal medicine sub-I) or, if the career advisor approves, FCM 140.40 (family medicine sub-I). First 8 weeks must be done in different departments.

B. at least 8 weeks of Tier 1B in at least two different departments (NB: medicine rotations are exempt from this latter restriction).

<table>
<thead>
<tr>
<th>Table 3: Definition of Med4 Advanced Clinical Electives Tiers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tier 1A</strong></td>
</tr>
<tr>
<td>1. Characterized by responsibility for patient management.</td>
</tr>
<tr>
<td>2. Done under the supervision of UCSF faculty, therefore not &quot;away.&quot;</td>
</tr>
<tr>
<td>3. Must be done on services that have interns (or clear role for 4th years managing patients directly).</td>
</tr>
<tr>
<td>4. 4th years work side by side with house staff with a similar level of responsibility.</td>
</tr>
<tr>
<td>5. Required: Medicine 140.01 or FCM 140.40 (inpatient medicine). Must take by Winter Block 2.</td>
</tr>
<tr>
<td>6. At least one &quot;A&quot; rotation must be completed by the end of Fall Block 1.</td>
</tr>
<tr>
<td>7. Four weeks long</td>
</tr>
</tbody>
</table>

| **Tier 1B**                                                   |
| 1. Characterized by responsibility for patient management.    |
| 2. Done under the supervision of UCSF faculty, therefore not "away." |
| 3. Responsibility for patient management as member of primary or consultant team |
| 4. 40 hours or more per week                                  |
| 5. Two or four weeks long                                     |

| **Tier 2**                                                   |
| 1. No other Tier 2 rotations are required if Tier 1 "A" and "B" rotations have met the requirement for 24 advanced clinical weeks. |
| 2. Clinical content, but not necessarily patient care responsibility. |
| 3. May be done "away" but must be signed off on by the analogous UCSF dept as conforming to general requirements. |
| 4. Two weeks out of the 3-week CODA course qualifies as a Tier 2 rotation. |
| 5. Also 40 hours/week expected                                |

**Discretionary Work**. MS4s must complete at least 17 weeks of discretionary work, which can include any of the following.

1. Pathways to Discovery (PtD) work
2. Research
3. Additional clinical electives
4. Independent study/international work not through PtD -- up to 4 weeks. It is not possible to receive credit for a language program.

**CODA.** All students are required to take this course in the spring of their fourth year, immediately prior to graduation. The course structure is modeled after Intersessions, and includes a series of lectures, skills sessions, large and small group sessions, and an elective immersion experience. The central intent of CODA is to prepare medical students for the transition to internship by consolidating their fund of knowledge, promoting cognitive skills, and practicing clinical and technical skills. The key programmatic goals for CODA are:
1. Provide a broad review of essential clinical information and skills, and stimulate lifelong learning habits. ACLS is offered to approximately 110 students, and is generously funded by both the Alumni Association and the Department of Surgery.

2. Anticipate important themes in internship (work/personal life balance) and address the 2 greatest fears of interns (harming a patient and appearing foolish in clinical settings).

3. Provide closure & time to say farewell, particularly to the highest rated faculty who have provided instruction over the previous 4 years of medical school, and are invited to participate in CODA.

More specifically, the curriculum focuses on:

a) **core medical knowledge**: essential diagnoses, commonly encountered clinical problems, and focus on management and skills,

b) an **understanding of hospital systems** (i.e. how a hospital works, working in teams, working across specialties, understanding medicolegal risk, and signing out safely),

c) **succeeding in internship**, (managing personal finances, balancing personal life and work).

Grading is pass/fail, and determined by attendance at 3 required small groups sessions selected by the students: the themes of the three workshops are - intern survival skills, clinical basics, and advanced topics and procedures.
IV. **Assessment of Med4 @ UCSF: Detailed Analysis**

**Assessment of Advanced Clinical Care Electives.** MS4s took a total of 1211 clinical electives in 08-09. 27% of the electives taken were Tier 1A, 44.5% were Tier 1B, and 28.5% Tier 2 (Table 4). Nearly 42% of the electives occurred at Parnassus compared to 28% at the SFVA and 14% at SFGH (Table 5). Nearly 64% were of 4 week duration compared to 36% of 2 week duration (Table 6). Of note, a large proportion of tier 1B electives taken by MS4s (65.6%) were of 2-week duration (Table 6). The vast majority of MS4s (90%) meet their 4 week sub-I requirement via internal medicine (Table 7). In addition to the required sub-Is, the most frequently taken advanced clinical electives over the past four years have been: ICU at SFGH and Parnassus, Emergency Medicine at SFGH and Highland, ID, palliative care, hematology, GI, endocrine, nephrology, ophthalmology for primary care, principles of lab medicine, clinical therapeutics, toxicology, ECG interpretation, and diagnostic radiology (Tables 8, 9, & 10). Sub-I rankings from the class of 2008 are stellar (Table 11 - all 4+ ratings on a scale for 1-5, except for teaching of physical findings at 3.96).

**These data raise several issues regarding Med4:**

1. 42% of the clinical electives taken are tier 1B, but 65% of these are two week electives. 28% of electives taken are Tier 2 which does not require primary patient care responsibility. Are such clinical electives sufficiently aligned with the competencies that we want MS4s to further develop and master? Does the lack of authentic role in many of these electives diminish the learning value and lead students to perceive the need for more flexibility?

2. Tier 1B and 2 electives, faculty, or students are not evaluated. Expanded assessment of all fourth year clinical electives should be considered as part of a system to ensure quality improvement.
<table>
<thead>
<tr>
<th>Tier</th>
<th>SFVA Number (%)</th>
<th>SFGH Number (%)</th>
<th>Parnassus Number (%)</th>
<th>Other Local Number (%)</th>
<th>Other Away Number (%)</th>
<th>Other Foreign Number (%)</th>
<th>Total Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>43 (13.2%)</td>
<td>132 (40.5%)</td>
<td>117 (35.9%)</td>
<td>30 (9.2%)</td>
<td>4 (1.2%)</td>
<td></td>
<td>326 (100%)</td>
</tr>
<tr>
<td>1B</td>
<td>94 (17.5%)</td>
<td>158 (29.4%)</td>
<td>232 (43.1%)</td>
<td>48 (8.9%)</td>
<td>6 (1.1%)</td>
<td></td>
<td>538 (100%)</td>
</tr>
<tr>
<td>2</td>
<td>36 (10.5%)</td>
<td>52 (15.1%)</td>
<td>155 (45.1%)</td>
<td>4 (1.1%)</td>
<td>88 (25.6%)</td>
<td>9 (2.6%)</td>
<td>344 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>173 (14.3%)</td>
<td>342 (28.3%)</td>
<td>504 (41.7%)</td>
<td>82 (6.8%)</td>
<td>98 (8.1%)</td>
<td>9 (0.7%)</td>
<td>1208</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tier</th>
<th># students</th>
<th># distinct electives</th>
<th>% of total electives taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>326</td>
<td>31</td>
<td>27.0%</td>
</tr>
<tr>
<td>1B</td>
<td>538</td>
<td>70</td>
<td>44.5%</td>
</tr>
<tr>
<td>2</td>
<td>344</td>
<td>31</td>
<td>28.5%</td>
</tr>
<tr>
<td>Total</td>
<td>1208</td>
<td>132</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tier</th>
<th>2 week duration N (%)</th>
<th>4 week duration N (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>0 (Tier 1A must be 4 wks)</td>
<td>326 (100%)</td>
<td>326</td>
</tr>
<tr>
<td>1B</td>
<td>353 (65.6%)</td>
<td>185 (34.4%)</td>
<td>538</td>
</tr>
<tr>
<td>2</td>
<td>83 (24.1%)</td>
<td>261 (75.9%)</td>
<td>344</td>
</tr>
<tr>
<td>Total</td>
<td>436 (36.1%)</td>
<td>772 (63.9%)</td>
<td>1208</td>
</tr>
</tbody>
</table>

Table 4: Advanced Clinical Care Electives, AY08-09

Table 5: Advanced Clinical Electives by Site (08-09)

Table 6: Advanced Clinical Care Electives by Duration (08-09)
### Table 7: Required Sub-I by Site and Discipline

<table>
<thead>
<tr>
<th>DEPT</th>
<th>COURSE#</th>
<th>SITE</th>
<th>Duration</th>
<th>Maximum Quota Per Block</th>
<th>Maximum Quota Per Year</th>
<th>05-06 N (%)</th>
<th>06-07 N (%)</th>
<th>07-08 N (%)</th>
<th>08-09 N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCM</td>
<td>140.40</td>
<td>SFGH</td>
<td>4</td>
<td>2</td>
<td>16</td>
<td>8 (6%)</td>
<td>14 (9%)</td>
<td>11 (7%)</td>
<td>14 (10%)</td>
</tr>
<tr>
<td>MED</td>
<td>140.01A</td>
<td>Parn</td>
<td>4</td>
<td>7</td>
<td>56</td>
<td>47 (33%)</td>
<td>46 (30%)</td>
<td>53 (34%)</td>
<td>41 (28%)</td>
</tr>
<tr>
<td>MED</td>
<td>140.01B</td>
<td>SFGH</td>
<td>4</td>
<td>6</td>
<td>55</td>
<td>46 (33%)</td>
<td>48 (32%)</td>
<td>55 (35%)</td>
<td>50 (34%)</td>
</tr>
<tr>
<td>MED</td>
<td>140.01C</td>
<td>VA</td>
<td>4</td>
<td>5</td>
<td>43</td>
<td>40 (28%)</td>
<td>43 (28%)</td>
<td>39 (25%)</td>
<td>41 (28%)</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>141 (100%)</td>
<td>151 (100%)</td>
<td>158 (100%)</td>
<td>146 (100%)</td>
</tr>
</tbody>
</table>

### Table 8: TIER 1A electives ≥ 19 students in any given year
(8 required weeks; 4 must be med 140.01 or fcm 140.40; Characterized by responsibility for patient management)

<table>
<thead>
<tr>
<th>DEPT</th>
<th>COURSE#</th>
<th>DESCRIPTION</th>
<th>SITE</th>
<th>Duration</th>
<th>Maximum Quota Per Block</th>
<th>Maximum Quota Per Year</th>
<th>05-06</th>
<th>06-07</th>
<th>07-08</th>
<th>08-09</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANES</td>
<td>140.03A</td>
<td>ADVANCED INTENSIVE CARE UNIT</td>
<td>SFGH</td>
<td>4</td>
<td>2</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td>ANES</td>
<td>140.03B</td>
<td>ADVANCED INTENSIVE CARE UNIT</td>
<td>Parn</td>
<td>4</td>
<td>2</td>
<td>24</td>
<td>23</td>
<td>18</td>
<td>22</td>
<td>17</td>
</tr>
<tr>
<td>EMER</td>
<td>140.10</td>
<td>ADVANCED EMERGENCY MED -- SFGH</td>
<td>SFGH</td>
<td>4</td>
<td>8</td>
<td>96</td>
<td>61</td>
<td>73</td>
<td>62</td>
<td>58</td>
</tr>
<tr>
<td>EMER</td>
<td>140.40</td>
<td>ADVANCED EMERGENCY MED -- HIGHLAND</td>
<td>Highland</td>
<td>4</td>
<td>#3</td>
<td>36</td>
<td>22</td>
<td>31</td>
<td>18</td>
<td>28</td>
</tr>
<tr>
<td>MED</td>
<td>140.01A</td>
<td>SENIOR MEDICINE</td>
<td>Parn</td>
<td>4</td>
<td>7</td>
<td>56</td>
<td>47</td>
<td>46</td>
<td>53</td>
<td>41</td>
</tr>
<tr>
<td>MED</td>
<td>140.01B</td>
<td>SENIOR MEDICINE</td>
<td>SFGH</td>
<td>4</td>
<td>6</td>
<td>55</td>
<td>46</td>
<td>48</td>
<td>55</td>
<td>50</td>
</tr>
<tr>
<td>MED</td>
<td>140.01C</td>
<td>SENIOR MEDICINE</td>
<td>VA</td>
<td>4</td>
<td>5</td>
<td>43</td>
<td>40</td>
<td>43</td>
<td>39</td>
<td>41</td>
</tr>
</tbody>
</table>
Table 9: TIER 1B electives ≥ 19 students in any given year
(8 required weeks or additional T1A responsibility for patient management as member of primary team or consultant)

<table>
<thead>
<tr>
<th>DEPT</th>
<th>COURSE#</th>
<th>DESCRIPTION</th>
<th>SITE</th>
<th>Duration Weeks</th>
<th>Maximum Quota Per Block</th>
<th>Maximum Quota Per Year</th>
<th>05-06</th>
<th>06-07</th>
<th>07-08</th>
<th>08-09</th>
</tr>
</thead>
<tbody>
<tr>
<td>DERM</td>
<td>140.01</td>
<td>CLINICAL CLERKSHIP</td>
<td>Multiple</td>
<td>2</td>
<td>10</td>
<td>110</td>
<td>87</td>
<td>95</td>
<td>98</td>
<td>88</td>
</tr>
<tr>
<td>MED</td>
<td>140.28</td>
<td>INFECTIOUS DISEASE – 2 WEEKS</td>
<td>SFGH</td>
<td>2</td>
<td>2</td>
<td>48</td>
<td>22</td>
<td>29</td>
<td>34</td>
<td>20</td>
</tr>
<tr>
<td>MED</td>
<td>140.05</td>
<td>PALLIATIVE CARE</td>
<td>Parn</td>
<td>2</td>
<td>2</td>
<td>48</td>
<td>13</td>
<td>32</td>
<td>41</td>
<td>38</td>
</tr>
<tr>
<td>MED</td>
<td>140.16</td>
<td>HEMATOLOGY</td>
<td>SFGH</td>
<td>2</td>
<td>1</td>
<td>24</td>
<td>15</td>
<td>19</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>MED</td>
<td>140.18</td>
<td>GASTROENTEROLOGY – 2 WEEKS</td>
<td>VA</td>
<td>2</td>
<td>2</td>
<td>48</td>
<td>19</td>
<td>13</td>
<td>21</td>
<td>16</td>
</tr>
<tr>
<td>MED</td>
<td>140.30</td>
<td>ENDOCRINOLOGY-METABOLISM – 2 WEEKS</td>
<td>SFGH</td>
<td>2</td>
<td>2</td>
<td>48</td>
<td>17</td>
<td>17</td>
<td>27</td>
<td>16</td>
</tr>
<tr>
<td>MED</td>
<td>140.34</td>
<td>NEPHROLOGY – 2 WEEKS</td>
<td>Parn</td>
<td>2</td>
<td>1</td>
<td>24</td>
<td>19</td>
<td>15</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>OPHTH</td>
<td>140.05</td>
<td>OPHTHALMOLOGY FOR PRIMARY CARE</td>
<td>Multiple</td>
<td>2</td>
<td>2</td>
<td>28</td>
<td>26</td>
<td>22</td>
<td>25</td>
<td>21</td>
</tr>
</tbody>
</table>

Table 10: TIER 2 electives ≥ 19 students in any given year
(8 required weeks or additional T1A/T1B; clinical content but not necessarily patient care responsibility. “away” rotations)

<table>
<thead>
<tr>
<th>DEPT</th>
<th>COURSE#</th>
<th>DESCRIPTION</th>
<th>SITE</th>
<th>Duration Weeks</th>
<th>Maximum Quota Per Block</th>
<th>Maximum Quota Per Year</th>
<th>05-06</th>
<th>06-07</th>
<th>07-08</th>
<th>08-09</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMED</td>
<td>140.01</td>
<td>PRINCIPLES OF LAB MED</td>
<td>SFGH</td>
<td>2</td>
<td>4</td>
<td>46</td>
<td>23</td>
<td>15</td>
<td>26</td>
<td>31</td>
</tr>
<tr>
<td>MED</td>
<td>140.02</td>
<td>OFF-CAMPUS CLINICAL CLERKSHIP</td>
<td>Away</td>
<td>4</td>
<td>27</td>
<td>34</td>
<td>42</td>
<td>34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MED</td>
<td>140.22F</td>
<td>CLINICAL THERAPEUTICS</td>
<td>Multiple</td>
<td>40</td>
<td>24</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MED</td>
<td>140.42</td>
<td>TOXICOLOGY &amp; PHARMACOLOGY</td>
<td>SFGH</td>
<td>4</td>
<td>2</td>
<td>24</td>
<td>16</td>
<td>16</td>
<td>14</td>
<td>19</td>
</tr>
<tr>
<td>MED</td>
<td>140.91</td>
<td>ECG INTERPRETATION</td>
<td>Parn</td>
<td>4   #10</td>
<td>40</td>
<td>53</td>
<td>38</td>
<td>37</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>RAD</td>
<td>140.03</td>
<td>DIAGNOSTIC RADIOLOGY, PARN</td>
<td>Parn</td>
<td>4</td>
<td>8</td>
<td>72</td>
<td>83</td>
<td>75</td>
<td>72</td>
<td>59</td>
</tr>
<tr>
<td>RAD</td>
<td>140.09</td>
<td>DIAGNOSTIC RADIOLOGY, SFGH</td>
<td>SFGH</td>
<td>4</td>
<td>5</td>
<td>50</td>
<td>6</td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RAD</td>
<td>140.17</td>
<td>CLINICAL RADIOLOGY -- 2 WEEKS</td>
<td>VA</td>
<td>2</td>
<td>2</td>
<td>46</td>
<td>34</td>
<td>24</td>
<td>36</td>
<td>33</td>
</tr>
<tr>
<td>Question</td>
<td>Med 140.01: Parnassus</td>
<td>Med 140.01: SFGH</td>
<td>Med 140.01: VAMC</td>
<td>Med 140.01 Overall</td>
<td>FCM 140.40 Overall</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>------------------</td>
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<td>--------------------</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>N</td>
</tr>
<tr>
<td>Usefulness of the orientation</td>
<td>49</td>
<td>4.41</td>
<td>0.64</td>
<td>47</td>
<td>4.40</td>
<td>0.83</td>
<td>35</td>
<td>4.31</td>
<td>0.76</td>
<td>131</td>
</tr>
<tr>
<td>Clarity of objectives and student responsibilities</td>
<td>49</td>
<td>4.49</td>
<td>0.71</td>
<td>51</td>
<td>4.45</td>
<td>0.70</td>
<td>35</td>
<td>4.60</td>
<td>0.69</td>
<td>135</td>
</tr>
<tr>
<td>Usefulness of written materials</td>
<td>47</td>
<td>4.15</td>
<td>0.83</td>
<td>46</td>
<td>4.17</td>
<td>0.82</td>
<td>32</td>
<td>4.25</td>
<td>0.84</td>
<td>125</td>
</tr>
<tr>
<td>Use of research evidence to support practice</td>
<td>48</td>
<td>4.56</td>
<td>0.58</td>
<td>51</td>
<td>4.35</td>
<td>0.77</td>
<td>35</td>
<td>4.66</td>
<td>0.64</td>
<td>134</td>
</tr>
<tr>
<td>Care for culturally diverse patients</td>
<td>49</td>
<td>4.45</td>
<td>0.68</td>
<td>51</td>
<td>4.75</td>
<td>0.59</td>
<td>34</td>
<td>4.15</td>
<td>0.99</td>
<td>134</td>
</tr>
<tr>
<td>Overall quality of faculty clinical teaching</td>
<td>48</td>
<td>4.71</td>
<td>0.54</td>
<td>51</td>
<td>4.51</td>
<td>0.67</td>
<td>35</td>
<td>4.71</td>
<td>0.57</td>
<td>134</td>
</tr>
<tr>
<td>Overall quality of resident clinical teaching</td>
<td>49</td>
<td>4.61</td>
<td>0.67</td>
<td>51</td>
<td>4.49</td>
<td>0.78</td>
<td>35</td>
<td>4.60</td>
<td>0.69</td>
<td>135</td>
</tr>
<tr>
<td>Quality of formal teaching (i.e., seminars, didactics)</td>
<td>47</td>
<td>4.49</td>
<td>0.62</td>
<td>50</td>
<td>4.32</td>
<td>0.77</td>
<td>34</td>
<td>4.47</td>
<td>0.79</td>
<td>131</td>
</tr>
<tr>
<td>Adequacy of direct observation of your clinical skills</td>
<td>47</td>
<td>4.13</td>
<td>0.82</td>
<td>50</td>
<td>3.94</td>
<td>0.96</td>
<td>34</td>
<td>4.21</td>
<td>0.91</td>
<td>131</td>
</tr>
<tr>
<td>Adequacy of feedback on your performance</td>
<td>49</td>
<td>4.53</td>
<td>0.62</td>
<td>51</td>
<td>4.29</td>
<td>1.03</td>
<td>35</td>
<td>4.54</td>
<td>0.82</td>
<td>135</td>
</tr>
<tr>
<td>The logistics during this clerkship helped maximize your learning (e.g. schedules, locations, etc.)</td>
<td>49</td>
<td>4.39</td>
<td>0.73</td>
<td>51</td>
<td>4.37</td>
<td>0.80</td>
<td>35</td>
<td>4.51</td>
<td>0.74</td>
<td>135</td>
</tr>
<tr>
<td>The material was integrated in a useful way for your learning.</td>
<td>48</td>
<td>4.48</td>
<td>0.68</td>
<td>50</td>
<td>4.42</td>
<td>0.73</td>
<td>34</td>
<td>4.47</td>
<td>0.86</td>
<td>132</td>
</tr>
<tr>
<td>Your achievement of course objectives</td>
<td>48</td>
<td>4.48</td>
<td>0.74</td>
<td>51</td>
<td>4.47</td>
<td>0.70</td>
<td>35</td>
<td>4.66</td>
<td>0.59</td>
<td>134</td>
</tr>
<tr>
<td>Adequacy of teaching of physical findings</td>
<td>46</td>
<td>3.89</td>
<td>0.95</td>
<td>47</td>
<td>4.00</td>
<td>0.91</td>
<td>33</td>
<td>4.00</td>
<td>1.03</td>
<td>126</td>
</tr>
<tr>
<td>Rate the appropriateness of your responsibilities for patient care</td>
<td>49</td>
<td>4.59</td>
<td>0.70</td>
<td>51</td>
<td>4.73</td>
<td>0.49</td>
<td>35</td>
<td>4.77</td>
<td>0.49</td>
<td>135</td>
</tr>
<tr>
<td>Rate the appropriateness of the variety of patients seen.</td>
<td>49</td>
<td>4.51</td>
<td>0.71</td>
<td>51</td>
<td>4.59</td>
<td>0.67</td>
<td>34</td>
<td>4.47</td>
<td>0.66</td>
<td>134</td>
</tr>
<tr>
<td>Rate the appropriateness of the number of patients seen.</td>
<td>49</td>
<td>4.43</td>
<td>0.87</td>
<td>51</td>
<td>4.59</td>
<td>0.73</td>
<td>35</td>
<td>4.57</td>
<td>0.61</td>
<td>135</td>
</tr>
<tr>
<td>The clerkship as a whole</td>
<td>49</td>
<td>4.43</td>
<td>0.82</td>
<td>51</td>
<td>4.45</td>
<td>0.78</td>
<td>35</td>
<td>4.60</td>
<td>0.60</td>
<td>135</td>
</tr>
</tbody>
</table>

* All items are on a 5-point scale: 1=poor, 2=fair, 3=good, 4=very good, 5=excellent
Assessment of CODA: CODA has been a highly rated course in the School of Medicine since its inception (Tables 12 & 13). As part of CODA 2008 - a pre-post course survey was performed to explore their perceptions of the strengths and weaknesses of the current course and whether the course had increased medical student confidence. Students were significantly more likely to rate themselves as prepared for residency on the three items with the lowest pre-course score: 1) communicating outside their chosen specialty; 2) maintaining their own well-being; and 3) recognizing what resources are available to manage a mistake made in internship. In addition, the CODA course is perceived by students as effectively facilitating the transition from student to house staff (Table 13). The optional immersion program developed by CODA may represent one important strategy to more effectively utilize the 4th year of medical school and take advantage of the precious educational time available during Med4 that is more scarce during residency. The data and committee discussions about CODA raise several questions:

1. The core principles of maturation, reflection, professional development, and communication were identified as essential to any future Med4 curriculum.
2. The possibility of offering CODA at an earlier point in the 4th year, or perhaps late in the 3rd year, should be considered as a means to accelerate student development in these arenas. Clearly both the approach to assessment (currently NONE other than self-assessment) and criteria for successful completion of the course would have to change if the course were to be placed earlier.
3. The timing of CODA as the final medical school course before graduation should also be re-evaluated. It was recognized that students might be better able to reflect and synthesize this material at that time since the anxiety about the match had passed, and they could now focus on preparing for the next step ahead---internship. However, student travel, arrangements for moving to new destinations for further training, and other events related to graduation were recognized as possible distractions.

<table>
<thead>
<tr>
<th>Year</th>
<th>n</th>
<th>Response Rate (%)</th>
<th>Mean Rating</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>66</td>
<td>66/131 (50)</td>
<td>4.36</td>
<td>0.76</td>
</tr>
<tr>
<td>2006</td>
<td>66</td>
<td>66/137 (50)</td>
<td>4.67</td>
<td>0.54</td>
</tr>
<tr>
<td>2007</td>
<td>45</td>
<td>45/143 (31)</td>
<td>4.27</td>
<td>0.86</td>
</tr>
<tr>
<td>2008</td>
<td>76</td>
<td>76/150 (51)</td>
<td>4.50</td>
<td>0.72</td>
</tr>
<tr>
<td>All years</td>
<td>253</td>
<td>253/561 (45)</td>
<td>4.49</td>
<td>0.72</td>
</tr>
</tbody>
</table>
Table 13: 2009 Student Ratings of CODA

<table>
<thead>
<tr>
<th>Question</th>
<th>Applicable Answers</th>
<th>Mean</th>
<th>Scale</th>
<th>Std</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization</td>
<td>64</td>
<td>4.77</td>
<td>1 to 5</td>
<td>0.43</td>
</tr>
<tr>
<td>Rate the course organization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning goals and objectives</td>
<td>64</td>
<td>4.67</td>
<td>1 to 5</td>
<td>0.56</td>
</tr>
<tr>
<td>Rate the clarity of learning goals and objectives</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lectures</td>
<td>64</td>
<td>4.61</td>
<td>1 to 5</td>
<td>0.58</td>
</tr>
<tr>
<td>Rate the usefulness of lectures for my learning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparation</td>
<td>64</td>
<td>4.61</td>
<td>1 to 5</td>
<td>0.55</td>
</tr>
<tr>
<td>Rate the relevance of the Coda Course in addressing your concerns regarding internship and residency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall Quality</td>
<td>64</td>
<td>4.70</td>
<td>1 to 5</td>
<td>0.49</td>
</tr>
<tr>
<td>Rate the overall quality of Coda</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

V. Assessment of Discretionary Work and Overall Med4

A number of different data sources give us insight into the discretionary work that occurs during Med4.

A. AAMC Graduate Questionnaire. The results from this annual questionnaire indicate that our recent graduates rate Med4 higher than the national average, including the areas of guidance, adequacy of elective time, helpfulness in preparation for residency, and clinical education. In 2008, 20% agreed that additional activities or selective should be added to the curriculum while 98% agreed that elective time was adequate. Impressively, over 90% of respondents stated that the fourth year was helpful in preparing them for residency and important for enhancing their clinical education. This supports one key finding:

1. Students have a very favorable rating of the Med4 experience.

Table 14: UCSF AAMC GQ 2006-2008 Summary of Items About the Fourth Year of Medical School Compared to Responses From All Schools in 2008

<table>
<thead>
<tr>
<th>Statement</th>
<th>UCSF 2006</th>
<th>UCSF 2007</th>
<th>UCSF 2008</th>
<th>All schools 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>I received appropriate guidance in the selection of fourth year elective activities.</td>
<td>71.4</td>
<td>66.7</td>
<td>76.8</td>
<td>64.3</td>
</tr>
<tr>
<td>At my school, elective time in the fourth year was adequate.</td>
<td>89.2</td>
<td>98.3</td>
<td>84.6</td>
<td></td>
</tr>
<tr>
<td>Additional required activities or selectives should be added to the fourth year at my medical school.</td>
<td>12.3</td>
<td>12.8</td>
<td>20.6</td>
<td>20.1</td>
</tr>
<tr>
<td>The fourth year was helpful in my preparations for residency.</td>
<td>90.2</td>
<td>94.7</td>
<td>83.6</td>
<td></td>
</tr>
<tr>
<td>The fourth year was important for enhancing my clinical education.</td>
<td>91.2</td>
<td>97.3</td>
<td>83.9</td>
<td></td>
</tr>
</tbody>
</table>
B. **Student profile study.** In the summer of 2008, data was extracted from the 2008 UCSF SOM graduates (N=159) Medical Student Performance Evaluation (MSPE). The purpose of the project was to determine the types of activities SOM students engaged in prior to and during medical school. For this report, we analyzed descriptions of student experiences in the following areas: extended time in medical school and activities during clerkships and Area of Concentration studies. We sought to determine the most prevalent student experiences in each of these three areas.

Findings from the class of 2008 student profile showed that many (28%) students extended their education at UCSF and that most of these students (88%) engaged in research during the extension. Many students (89%) also spent a substantial amount of time in the clinical years engaged in other activities which included off site clerkships, teaching and mentoring, curricular involvement and research. Less than half of students in the class of 2008 completed an AOC.

More detailed results are reported and summarized below for each of the 3 areas. The actual number and percentage of students involved in each activity are provided. Of note, the numbers and percentages reported do not represent exclusive categories; individual students may have engaged in multiple activities simultaneously.

**1. Extended Time During Medical School.** A total of 41 (28%) students extended their 4 years of medical school at UCSF. Approximately 88% extended this time for research, 15% for an additional degree, 5% for curricular involvement, 5% for travel related to medicine and 5% for volunteer or service work. Of those students who engaged in research, about half (51%) did so in-state and, impressively, 44% reported their research resulted in a presentation and 32% in a publication.

<table>
<thead>
<tr>
<th>Table 15: Reasons Medical Students Extend Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Extended For Research of any kind 87.8%. Types of research included:</td>
</tr>
<tr>
<td>▪ Extended Research In-State 51.2%</td>
</tr>
<tr>
<td>▪ Extended Research Presentation 43.9%</td>
</tr>
<tr>
<td>▪ Extended Research Publication 31.7%</td>
</tr>
<tr>
<td>▪ Extended Research Global 19.5%</td>
</tr>
<tr>
<td>▪ Extended Research AOC 12.2%</td>
</tr>
<tr>
<td>▪ Extended Research Out Of State 7.3%</td>
</tr>
<tr>
<td>• Extended for Additional degrees 14.6%</td>
</tr>
<tr>
<td>• Extended for Curricular involvement 4.9%</td>
</tr>
<tr>
<td>• Extended for Travel Medical 4.9%</td>
</tr>
<tr>
<td>• Extended for Volunteer or Service Work 4.9%</td>
</tr>
</tbody>
</table>

Source: Medical Student Performance Evaluation for UCSF SOM Class of 2008
2. Activities During Med3 (N=132). A total of 132 (89%) students engaged in various activities during their clerkship year. During the clerkships, 36% completed off campus clerkships, 33% taught or mentored other students (other medical or non medical students), 29.5% participated in a curricular or medical education projects, 29% completed a research publication, 26% participated in research, and 20.5% completed a research presentation.

<table>
<thead>
<tr>
<th>Table 15: Activities Engaged in During Clerkships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed off-campus clerkships 36.4%</td>
</tr>
<tr>
<td>Participated in teaching/ mentoring activities 32.6%</td>
</tr>
<tr>
<td>Participated in curricular/MedEd involvement 29.5%</td>
</tr>
<tr>
<td>Completed a research publication 28.8%</td>
</tr>
<tr>
<td>Completed a research 25.8%</td>
</tr>
<tr>
<td>Completed a research presentation 20.5%</td>
</tr>
<tr>
<td>Completed a activity involvement 18.2%</td>
</tr>
<tr>
<td>Involved in Active Leadership 15.9%</td>
</tr>
<tr>
<td>Involved in a Publication 4.5%</td>
</tr>
<tr>
<td>Involved in volunteer/service work 4.5%</td>
</tr>
<tr>
<td>Learned a language for medical purposes 3%</td>
</tr>
<tr>
<td>Involved in Independent Study 2.3%</td>
</tr>
<tr>
<td>Employed 1.5%</td>
</tr>
<tr>
<td>Involved in an extracurricular Activity 1.5%</td>
</tr>
</tbody>
</table>

Source: Medical Student Performance Evaluation for UCSF SOM Class of 2008

3. Area of Concentration (AOC) (N=59). A total of 59 (40%) students participated in an AOC. Of these, 58% completed a legacy project and 51% completed a legacy research project. The largest number of students participated in the Medical Education (36%) and Global Health (24%) AOC.

<table>
<thead>
<tr>
<th>Table 16: Types of Participation in Area of Concentration (N=59)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed a Legacy Project 57.6%</td>
</tr>
<tr>
<td>Completed a Legacy Research 50.8%</td>
</tr>
<tr>
<td>Completed a Med Ed AOC 35.6%</td>
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<tr>
<td>Completed a Global Health AOC 23.7%</td>
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<tr>
<td>Completed a Community Health &amp; Social Advocacy AOC 13.6%</td>
</tr>
<tr>
<td>Completed a Science of Medicine and the Physician-Investigator AOC 11.9%</td>
</tr>
<tr>
<td>Completed a Health Care Systems and the Physician-Leader AOC 8.5%</td>
</tr>
<tr>
<td>Completed a Social Sciences in Medicine AOC 5.1%</td>
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<tr>
<td>Completed a Medical Humanities AOC 3.4%</td>
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Source: Medical Student Performance Evaluation for UCSF SOM Class of 2008
C. MS4 Focus Groups:

To guide decision making about the fourth year curriculum, twenty fourth-year medical students taking the CODA course were invited to participate in a focus group during April 2009. The purpose of the focus group was to understand the student perspective with respect to the following issues:

1. Reasons medical students take time off during medical school and in what ways this contributes to career development – e.g., enhancing residency application, developing as scholar, attaining life experience that helps mature, deciding on specialty, etc…
2. How the 4\textsuperscript{th} year, especially non-Sub-I electives, contributed to their preparation for internship
3. What aspects of the fourth year helped with professional development – career goals, specialty choice, work-life balance etc…
4. Factors that impact 4\textsuperscript{th} year student choice of activities in 4\textsuperscript{th} year

The sample was purposefully designed to include students who did not extend their education at UCSF as well students who did extend their education at UCSF SOM for reasons other than personal reasons, students who matched into subspecialty as well as primary care residencies, and students who matched at UCSF and elsewhere. 12 students participated in the group (9 focus group participants, 3 written responses). Of those participants, 5 students took some time off. The numbers in parentheses indicate the number of students who provided or agreed with this response

\textbf{Theme 1: Extended time in medical school} (Questionnaire Q1; FG Q1 & 2). Most of the students who extended their time in medical school did so to decide on their career goals and make career decisions (3). Taking extra time (or time off) allowed students to travel and to work on research which these students felt helped them to clarify career goals, identify a new career focus, and build confidence. One student mentioned personal / life issues as his/her reason for extending. The 5\textsuperscript{th} student was a PhD student. The students described the extended time as extremely helpful. (4)

Most students who extended took the extra time between 3\textsuperscript{rd} & 4\textsuperscript{th} year (3). One reported taking the time during 4\textsuperscript{th} year. The other was a PhD student.

Most of those who did not extend their medical school education chose not to extend because of financial reasons (4). Also some of the non-extenders had already taken time off prior to medical school and thus did not want to extend further (2) and some felt that taking time off would interfere with their clinical training either because they were enjoying it or because they were afraid of losing their clinical skills (2)

\textbf{Theme 2: 4\textsuperscript{th} year schedule} (FG Q4). Many of the choices that students made about their 4\textsuperscript{th} year schedule were influenced by career decisions. Most of the students who knew their career choice said they designed their 4\textsuperscript{th} year
schedule to give them broader experience in the specialty of their choice and related specialties / subspecialties. (5)

Several students said they scheduled their sub-Is early in the year so the grades would appear on their transcript. Others said they also scheduled the sub-Is early to help them determine their career choice (2). Some students indicated that the sub-I experience reinforced their choice NOT to go into certain specialties (2). And finally students who wanted to do “away” rotations and to experience other locations and programs built their 4th year schedule with the away rotations in mind.

Several scheduling challenges in the 4th year were described, along with a few suggestions:

1. Completing the residency rank list was all consuming, very stressful, and very difficult (4) and more mentoring would have been appreciated (2).

2. The interview, moving, and step II process was a significant financial burden and often times accompanied by additional unknown costs (6). Student suggested there be more financial aid guidance and support and that students be informed in advance about these financial burdens.

3. Taking time off for interviews was difficult (6) because some electives only allowed 1 day/month. These restrictions made it difficult to interview in other locations/states. Students recommended that electives allow more flexibility for interview time (9).

Theme 3: sub-Is, clinical electives, and suggestions for 4th year courses (FG Q5, Q6, and Q7). Most students valued the sub-I experiences and considered them a valuable part of their UCSF educational experience, though for varying reasons (11). Some students felt the Sub-Is helped build their confidence and teach them about the role of an intern including ownership for patients (5). Some students said the sub-Is gave them exposure to areas with which they were unfamiliar (3).

Students also varied in their perceptions of the clinical electives. Some found the clinical electives useful (5) for their learning and career choice, highlighting key learning outcomes such as: exposure to procedures (6), learning about medicine outside of UCSF hospitals (7), and how to call consults (4). Other students, however, were not sure what they learned from the clinical electives and said they went into the electives with no expectations (3).

Students’ considered several factors when choosing clinical electives, including:

1. Exposure to new areas (4)
2. Provision of skills that are useful to a doctor, regardless of specialty choice i.e.: Radiology
3. Reputation / word of mouth (6)
4. Availability (5)
5. Guidance from Maureen in OCA (very knowledgeable about locations and how useful / interesting the electives are according to previous students) (5)
6. Time off (2)

Students provided several suggestions for 4th year courses such as:

a. Offering sessions on procedures (9)
   - Allow students to gain more experience
   - Offer a procedures elective
   - Refresher course on procedures for students who take time off

b. Allowing more flexibility in scheduling (9)
   - Ability to move things around
   - Ability to take time off – especially for interviews (5)
   * Contrast (from a student who extended): just right – appreciated the amount of flexibility (1)

c. Required Sub-I’s (differing views on keeping medicine as a required sub-i)
   - Allow choice of Sub-I in most common fields (Med, Peds, Psych)

d. Add an experiential rotation (¿ – in residency specialty?) (6)
   - Sub-I near end of 4th year as a refresher for ‘life on the wards’ (1)

e. Coda
   - Start the review earlier (¿) (2)
   - More EBM sessions to learn where to find info (2)

f. Add more formalized session on how to teach (4)
   - 2 hrs in CODA not enough if didn’t do Med Ed AOC

g. Improve the scheduling process for electives (1), including online elective scheduling process that allows you to:
   - See what electives are open
   - See position on waitlist
   - Have system alert you if you have not met requirements
   - Eliminate 2 month drop policy for electives (especially consult services and non-clinical electives)

**Theme 4: Professional development** (FG Q6). Fourth year is “all about professional development” (9). Students described 4th year as the time when many big decisions are made and when life feels particularly chaotic (6).

Many students feel the 4th year is important to career development. Some examples included decisions about career track (4) based on sub-I experiences, time spent doing research, connecting with or observing physicians in a particular field or specialty (3), and exposure to broader
aspects of medicine that developed into an area of interest (e.g. advocacy, law, politics, systems). In addition, 4th year was highlighted as a time to prepare for transitions (learning what residency will be like, what different career paths are like) and to ask questions or seek advice about lifestyle, specific issues in different specialties, residency programs & application process, and rank list.

The 5 students who extended their time in med school discussed the relationship between the extended time and professional development in 4th year. These students felt the extended time helped with their professional development (5). The additional time made the year less stressful (especially around application time), provided more flexibility in scheduling, and allowed time for international travel and research.

**Theme 5: Confidence level related to entering residency** (FG Q8). Overall many students felt prepared for residency because of their education at UCSF (9). This confidence was reinforced by alumni, seeing that they are doing ok and by meeting other students from different schools during interviews. (4) Some students were nervous (5), but most students felt that they were where they should be and probably were as ready as they would ever be (8).

Most students commented that having close to a month off before intern year was appreciated (9) because it allowed them to rest before the intern year and made life a little easier for students who had to move (5).

**Committee discussion on this data raised the following points:**
1. **Sub-Is play an important role in specialty choice, at least for a significant minority of students.** Do sub-Is help a student understand what a specialty will be like, or more what a residency will be like? Does the design of our clinical curriculum with relatively late and short exposure to different specialties undermine career choice? LCE and now PISCES are offering a qualitatively different opportunity to take a look at what a professional career might entail.
2. **It is hard to take time off for interviews from time-limited, esp. 2 week, electives.** This may argue for defining learning experiences in ways other than by a chunk of time on a service/with a team.

**C. Resident Focus Groups:** see subsequent report September 2010.

**D. Specialty choice:** The Office of Curricular Affairs collects information about specialty choice from MS4s early in the fourth year. As of June 1, 2009 (2-3 weeks into their fourth year), about 29% were still deciding on a specialty. Interestingly, students who extended were disproportionately represented among those who were undecided. An extended curriculum doesn’t necessarily mean clarifying career choice. Several of the undecided students indicated a topical interest (eg, health for underserved women, international health) and seemed to be deciding which specialty
was best for pursuing that interest. Others knew they wanted to do primary
care, but not sure which specialty. Another student indicated that “broad
interests and indecisiveness to choose a specific career path” make his
specialty choice more comfortable b/c he can choose from a wide variety
of subspecialties. This data surfaces another important characteristic of
the current system:

1. **At the beginning of Med4, a substantial percentage (~30%) of
   students have not yet decided on their specialty.**

2. **How can the curriculum during the first 3 years better facilitate
   specialty choice?** Early evidence does seem to suggest that
   longitudinal, integrated clinical experiences does help facilitate
   earlier choice of specialty, both by experience in authentic
   settings and by seeing the wider range of specialties as they
   relate to a patient (vs. spending a chunk of time immersed in a
   few).

3. **How can Med4 optimally support students in this important
decision?**

VI. **Zoo Retreat**

A day-long educational retreat focusing on educational innovation at
UCSF was held at the San Francisco Zoo Conference Center. Attendees of the
retreat included educators and educational administrators from across the
UCSF School of Medicine and the various clinical departments, the office of the
Associate Dean for Medical Education, UCSF medical students and residents.
The retreat was a follow-up to a similar retreat held a year ago in which the
concept of a “3 + 1” structure for medical school was developed. This concept
served as a starting point for many of the discussions undertaken at the retreat.
Thus, during part of these discussions, attention was focused on Med4.

John Young gave an overview of the status of the work of the Advanced
Studies Committee that has focused on the Med4. David Daikh and John Stein
then moderated a series of focus groups in which small groups of retreat
participants joined in 15-20 minute discussion of specific questions relating to
the Med4.

An emergent and consistent theme is that the 4th year provides students
with a unique opportunity in that there is time for rest and reflection as well as
for consolidation and focused career-oriented work. Views were expressed
frequently that each of these goals are important to maintain and support. The
availability of a significant period of flexible time is a major strength of the 4th
year and this may be further enhanced in a 3+1 format. The great breadth of
available experiences available to MS4s at UCSF and beyond is a significant
strength. Another important strength of the current system is that students are
very capable by the time they are MS4s and are ready to take on more
responsible clinical roles at this stage of their training experience. The Coda
course is a successful and important component of the 4th year student’s
preparation for assuming clinical responsibility as a physician.
However, these strengths also are the underpinning of some weaknesses in the current system. The availability of flexible time can lead to its inefficient use. There is a sense that many of the activities of MS4s are not specifically goal oriented. The pathway program is not well integrated into the 4th year. This is not to say that all the time in the 4th year must or should be spent engaged in work towards a professional goal; time for rest may be an important goal for a particular student. However, in the current system the 4th year may not even offer an adequate opportunity for rest, as many students take time off from school completely – necessitating a 5th year, which is very expensive, inefficient and exacerbates the problem of loan obligation. An ongoing need for MS4s is to consolidate what they have learned and to have the opportunity to address additional aspects of medicine that are often difficult to cover in a traditional course format. Thus, the need for an additional, perhaps more advanced Coda-type course was suggested.

Certain elements of the current 4th year structure are clearly important and beneficial in their current form. It is important to maintain some ongoing clinical responsibility during 4th year so that there is continuing clinical learning and proficiency development. An important component of this clinical work is the sub-internship experience that entails significant responsibility and residency preparedness. The Coda course is also in this category and there were several suggestions for expanding this kind of experience in the 4th year. Maintenance of a high degree of scheduling flexibility in the 4th year is also an important goal.

With these considerations in mind, the ideal MS 4th year would achieve several important goals. These include 1) to provide students significant and useful opportunities for reflection and consolidation of their medical school training, including focus on global issues such as the relation of physicians and healing to community and society, the importance of self health and self healing, dealing with mistakes, and the tangible, but hard to define aspects of "physicianship;" 2) to accomplish a transition to a more responsible and independent clinical role; 3) to provide mentored professional development and professional identity formation; and 4) to provide a flexible schedule that can accommodate widely divergent individual needs and priorities – from time away from a structured educational environment to a highly focused research experience. Such time could be also used for additional learning experiences as needed for individual students.

Some of these specific goals may be achieved via innovative educational programs. Increased flexible time could be realized by meeting the objectives of some important Tier B "rotations" through self-directed learning, web-based teaching projects, or by involving MS4s in teaching of MS1-3. Short-term experiences in specific clinical settings could be used to foster independence, professionalism and interpersonal communication skills. Examples might include having primary responsibility for the pre-op surgical evaluation and discussions with patient and family before surgery at the interface of anesthesia and surgery on a surgery team; functioning as an independent consultant and reporting directly to the attending on a medicine consult or med subspecialty
consult team; working on a psychiatry consult team to gain specific experience in managing challenging patients and families one on one and in family meeting settings; sharing or taking the role of the triage nurse in a busy emergency department. Thus, such integrative experiences could be tailored to individual student's clinical career paths.

Career choice and development are very important, require mentorship, and can't wait until the 4th year. Mentoring relationships established earlier need to be continued in the 4th year and should include a formative assessment based on discussion with mentor and advisor of what the student wants and needs to do with their final year of education that is informed by the student's future goals. Integration of a 4th year plan into a specific Pathway could be one benefit of such planning.

Thus, a redesigned Med4 should include the following:

1. A relatively “open” year provided by a 3+1 format that has a large amount of flexible time.
2. Individual mentoring and structured assessment so that this time is well planned and spent and is useful to the individual student.
3. A majority of the 4th year would be scheduled in a highly flexible manner to meet individual learner needs and priorities. Such needs could include:
   i. time away from school for personal growth, reflection, rest, or family building
   ii. in depth focus on Pathway work
   iii. in depth focus on some other area of personal clinical interest or mastery
   iv. competency remediation
4. Rounding out of medical education in important areas, eg. professionalism, physicianship, health care delivery, quality, ethics, health and society.
   i. A Coda course at the beginning of 4th year focusing mainly on global issues
   ii. A second Code-type course towards the end of 4th year with a focus on more practical clinical issues in anticipation of internship. Some of these may be more global (eg. dealing with mistakes) and others may be specialty-specific.
5. Maintenance of clinical activity with an emphasis on roles of greater responsibility, eg. subinternships.

VII. Best Practices Nationally

There is increasing debate in the literature about the value of the 4th year of medical school, but published needs assessments and reports on curricular reform are scarce. From the students' perspective, a survey among final year medical students in Australia1 concluded that activities in the final year did not align well with curricular goals. Similar data have not been published for 4th year medical students in the United States, but comments made by US medical
students and recent graduates in on-line discussions point towards similar mal-alignment. Some call the 4th year “a total waste”, and “an expensive vacation” whereas others feel it is essential to “clarify career goals” and “gain medical maturity”. On another blog, students comment on how great 4th year is because it has free time: “As for me, I started brewing my own beer and I’ve been working my way through all of John Grisham’s novels. As far as I’m concerned, those are the only sorts of activities that fourth-year medical students should be involved in.

Several published reports address the training needs for 4th year medical students from the perspective of residency training programs in a particular specialty (for example, Surgery, Obstetrics and Gynaecology and Emergency Medicine). A group of researchers from UCSF recently published a needs assessment among residency program directors of a variety of specialties, which highlighted areas of consensus regarding training needs for the 4th year of medical school. The majority (93%) of program directors felt that students should complete a sub-internship in the field in which they are applying, but at the same time many (83%) cautioned against doing too many rotations in the intended specialty. Away rotations were not recommended to enhance chances in the match. A fourth-year rotation in Internal Medicine is recommended for workplace learning with extensive coaching to enhance the students’ competency in practice-based learning and improvement, professionalism and medical knowledge. Program directors want 4th year medical students to develop progressive skills in patient care including advanced clinical reasoning, independence, and ability to manage a larger patient load. A previously published survey among residency program directors on required skills for entering residency described a similar need for progression of skills. In a JAMA commentary on reform of the medical curriculum, Ezekiel Emanuel, a physician-ethicist at the NIH, suggests for the 4th year “instead of a year dominated by auditioning subspecialty rotations, 3 rotations could be devoted to management and health care financing course as 1-2 week executive style trainings. (...) In addition, 1-week blocks should also be used for formal courses reinforcing the communication and bioethics lessons (and a health law class).” Although many program directors in the UCSF study emphasized the need to develop competency in the domains of professionalism and interpersonal and communication skills as well as self-reflection, few endorsed making this the focus of curricular development.

Searching the literature for publications on curricular innovations pertaining to the 4th year of medical school revealed many reports focusing on a particular aspect or competency (for example, palliative medicine, cultural competency, communication skills, team work etc) but few reports addressing innovations for the 4th year as a whole. Only two publications were found that described a curricular innovation for the entire 4th year, the UCLA “College Phase” and the MCP-Hahnemann School of Medicine’s Pathways system. Three additional reports described “accelerated” curricula, with either an accelerated, 3-year medical school curriculum or a merging between the 4th year of medical school and the first year of residency.
UCLA introduced a “College Phase” in the 4th year of medical school in 2001, to “address the need for improved career advising and mentoring for senior medical students.” In College Phase, medical students choose to enroll in one of six “colleges”, depending on their specific interests and/or potential career goals. A “college” is a “curricular and administrative structure organized around a set of related specialties that share similar traits in their medical practice”. Each college has a chair and mentors from representative departments; examples are Acute Care (anesthesiology, emergency medicine, critical care), Primary Care (family medicine, internal medicine, pediatrics) Applied Anatomy (surgery, radiology, pathology) etc. Each college is responsible for delivering specific curricular activities, advising on electives, overseeing scholarly projects and career mentoring. The year starts with a one week “foundations” block focused on skill building, clinical reasoning and career planning during which relationships with mentors and other students of the college are established. Regular contact between mentor-student pairs and a mandatory longitudinal dinner seminar series keeps the students in touch with their college. Outcome data on the impact of “College Phase” were limited and based on survey results among graduating students before and after implementation of the innovation. They included increased identification of advisors, role models and career mentors, and high satisfaction with the curriculum.

The MCP-Hahnemann School of Medicine initiated a Pathway based system for the 4th year of medical school in 1997, “to allow the student to concentrate in a specific discipline while providing a broad general professional education and improving the advisory/career-counseling process”. Pathways are “departmentally oriented discipline-based” and have specific curricula. There are three required course rotations: Internal Medicine, Neurology, and an additional course dependent on the pathway. There are six elective courses with some strongly recommended dependent on the pathway. Pathways are either focused on a future discipline (for example: neurosurgery, dermatology, pediatrics) or on a career path, the latter seems similar to UCSF’s definition of pathways (for example MD PhD, MD MBA). There are pathway directors and mentorship including advice regarding electives is provided through the pathway. Neither the publication in Academic Medicine nor the website provide any outcome data about the pathways system.

Three publications addressed the possibility of an accelerated medical school and/or residency program. At Marshall University, the 4th year of medical school was merged with the 1st year of family practice residency, with as goal to increase the number of students who choose family practice as a career. 4th year students do almost the same rotations as 1st year residents, but have a longer orientation and are more closely monitored with twice-monthly meetings with faculty and monthly meetings with advisors. They receive a salary equivalent to PGY-1s and pay full tuition to the medical school. Among the small number of residents who were included in the published report, accelerated residents did better in many measures (fewer needed remediation, exam scores were higher, more were elected to be chief resident etc.).
students who were accepted to the accelerated career program were however older, and more often had had a previous career. Whether the program achieved its goal of increasing the number of students going into family medicine was not addressed in the paper. At New York Medical College and St Vincent’s Catholic Medical Centers of New York, a similar merge between 4th year of medical school and internal medicine residency led to no difference in performance between traditional and accelerated residents, but accelerated residents were more likely to stay in general internal medicine and less likely to opt for subspecialty training\textsuperscript{xiv}. At the Lake Erie College of Osteopathic Medicine, the motivation for a shortened curriculum was also grounded in the desire to increase the number of students choosing for primary care careers. Concerns regarding Medicare funding for a combined medical school/residency approach led to development of a 3-year medical school program\textsuperscript{xv}. The described curriculum adds a few new clinical rotations and eliminates others, mainly elective rotations. There is no mention of any other distinguishing features such as increased mentorship, and outcome data are not reported.

In summary, there is a paucity of data regarding the training needs for the 4th year of medical school, and even less is published on effective curricular innovations. Maturation as a physician, including improving competencies and independence, and further identification and development of career goals are the most frequently mentioned goals of 4th year training. Intensive coaching during clinical workplace learning and cohered mentorship in colleges or pathways are among the suggested and tried curricular innovations. Eliminating the 4th year of medical school, either by shortening the medical school curriculum to 3 year or combining the 4th year with the first year of residency has reported to be feasible. Motivation for this measure in the published reports was to increase the number of students who go in to primary care and it is unclear if and how such a shortened curriculum would address the needs of students with other career goals.

\section*{VIII. Assessment of Med4 @ UCSF: Synthesis of Data}

Data from multiple sources, including the AAMC graduation questionnaire, a focus group with ending 4th year students (MS4’s), and student evaluations of advanced clinical electives and required sub-I’s, indicate that students view the 4th year of medical school (Med4) very favorably. Recent graduates from UCSF rate Med4 higher than the national average for appropriate guidance for selection of electives, adequacy of elective time, helpfulness in preparation for residency, and enhancement of clinical education. Over 90% of respondents stated that the fourth year was helpful in preparing them for residency and important for enhancing their clinical education (AAMC grad questionnaire). Similar themes emerged from the focus group with ending MS4s from the class of 2009. Overall, they enjoyed their 4th year experience, felt prepared (or at least as prepared as they could be) for residency, and acknowledged that 4th year was “all about professional development.” They appreciated the flexibility of scheduling, CODA, and the month off in between medical school and residency. Most students
valued the sub-I experiences and considered them a valuable part of their UCSF educational experience.

Of note, 29% of the SOM Class of 2010 began fourth year not knowing their specialty choice. How can the curriculum during the first 3 years better facilitate specialty choice? Early evidence suggests that longitudinal, integrated clinical experiences help facilitate earlier choice of specialty, perhaps by participating in an authentic patient care role in a wide range of settings and specialties from the outset. How can Med4 optimally support students in this important decision?

Student evaluations of required sub-I’s (Tier 1A) were high – in the range of very good to excellent on all items \(^{xvi}\) and students reported that sub-I’s helped them build confidence, learn about the role of an intern, take increasing responsibility for patients, and gain exposure to areas with which they were unfamiliar \(^{xvii}\). However, for academic year 2008-09, only 27% of the electives taken were Tier 1A. 44% were Tier 1B and 65% of these Tier 1B electives had durations of two weeks. 28% of electives taken were Tier 2 which does not require primary patient care responsibility. A total of 1208 electives were taken that year. Students were more variable in their impressions of non-sub-I advanced clinical electives, with some finding them useful for their learning (e.g. procedures, calling consults, and medical practice outside of UCSF) and others feeling uncertain about what they learned from the electives. Tier 1B and Tier 2 electives are not currently evaluated by students. Are such clinical electives sufficiently aligned with the competencies that we want MS4s to further develop and master? Does the lack of authentic role and/or relatively brief length (i.e., 2 weeks) of many of these electives diminish the learning value and lead students to perceive the need for more flexibility?

To review the ways in which students actually spend their time in 4\(^{th}\) year, the committee analyzed data from MSPE letters for 2008 graduates. Interestingly, among the graduates in 2008, 41 (28%) extended their 4 years of medical school at UCSF. Approximately 88% extended this time for research, 15% for an additional degree, 5% for curricular involvement, 5% for travel related to medicine, and 5% for volunteer or service work. In the focus group with SOM Class of 2009, 5 of the 12 students had extended their time in medical school, primarily to decide on their career goals and make career decisions.

Data on MS4s’ selection of sub-I’s and clinical electives show that the vast majority meet their 4 week sub-I requirement via internal medicine (as required, except for a few who elect to do family medicine instead). Beyond sub-I’s, the most frequently taken advanced clinical electives over the past four years have been: ICU at SFGH and Parnassus, Emergency Medicine at SFGH and Highland, ID, palliative care, hematology, GI, endocrinology, nephrology, ophthalmology for primary care, principles of lab medicine, clinical therapeutics, toxicology, ECG interpretation, and diagnostic radiology. In the focus group,
students identified the following as important factors they consider in their selection of electives: exposure to new areas, provision of skills that are useful to a doctor regardless of specialty choice (e.g. radiology), reputation/word of mouth, availability, guidance about locations and how useful/interesting the electives are according to previous students, and time off. Students also put considerable thought into how to schedule sub-I's and clinical electives to facilitate career decisions, residency applications (e.g. whether or not the grade for the sub-I will appear on transcripts), and travel for interviews.

Other elective coursework options included participation in Pathways to Discovery (formerly called Areas of Concentration). A total of 59 graduates (40%) participated in a Pathway to Discovery (PTD) in 2007-08. The largest number of students participated in the Medical Education (36%) and Global Health (24%) PTDs.

In the spring of 2009, twenty four fourth-year medical students at UCSF were invited to participate in a focus group. 12 students participated. Students highlighted several areas for improvement:

1. Enhanced mentoring, advising, or guidance to support students during the residency interviewing and match process.
2. Provide more financial aid guidance and support so students are sufficiently informed in advance about the financial burdens associated with interviews, moving, and step II.
3. Change time-off policies in clinical electives to better accommodate time needed for interviews in other locations/states. Electives only allow 1 day/month with advance permission. This will require an innovative approach to defining curricular time – to which we are held by state board licensing requirements.
4. Make more flexible and transparent the process by which students sign up or drop electives.
5. Offer sessions on procedures (e.g. procedures electives or other opportunities for students to gain more experience doing procedures).
6. Add an experiential rotation (e.g. in residency specialty OR sub-I near end of 4th year as a refresher for 'life on the wards')

The most relevant data from our literature search came from an article by a group of UCSF researchers that reported results from a needs assessment among residency program directors of a variety of specialties. Study results highlighted areas of consensus regarding training needs for the 4th year of medical school. The majority (93%) of program directors felt that students should complete a sub-internship in the field in which they are applying, but at the same time many (83%) cautioned against doing too many rotations in the intended specialty. Away rotations were not recommended to enhance chances in the match. A fourth-year rotation in Internal Medicine was recommended for workplace learning with extensive coaching to enhance the students'
competency in practice-based learning and improvement, professionalism and medical knowledge. Program directors wanted 4th year medical students to develop progressive skills in patient care including advanced clinical reasoning, independence, and ability to manage a larger patient load.

IX. Conclusions about Med4

Strengths and Areas for Improvement

In sum, the current UCSF Med4 has a number of strengths:

1. The limited Med4 requirements (and conversely substantial selective and elective time) allow self-directed learners to craft a personalized learning plan.
2. An impressive breadth of experiences is readily available to MS4s.
3. Sub-internships in a wide range of specialties provide students with a highly valued experience as the primary clinician that stimulates significant learning and growth.
4. The CODA course facilitates transition to internship and consolidation of clinical skills.
5. Pathways to Discovery provide a structured student-directed learning experience to develop substantial expertise and scholarship in a focused area of inquiry.
6. Compared to students at other medical schools, students perceive the fourth year as valuable to their clinical education and as good preparation for residency (based on AAMC GQ data).

We also identified several areas for improvement with the current Med4:

1. Med4 Curriculum
   a. The Med4 curriculum is not competency-based, nor explicitly linked to the purpose of the medical school.
   b. The curricular activities of MS4s are not sufficiently goal directed.
   c. Students seem to acquire an expectation early in medical school that Med4 is a "vacation."
   d. The majority of advanced clinical electives taken are either two weeks or do not require responsibility for clinical management. In practice, some electives and attendings have minimal expectations of MS4s. Recent graduates describe how their clinical skills peak early in fourth year and then there is gradual slippage. A higher proportion of electives that require a primary role in clinical management may better advance learning.
   e. Insufficient learning seems to occur in several areas, including:
i. Integration and consolidation of clinical skills;
ii. Development of advanced clinical reasoning
iii. Routine incorporation of EBM into clinical practice;
iv. Critical self reflection aimed at identifying errors and
   promoting improvement;
v. Systems-based approach to recognizing and preventing
   medical error and patient harm.

f. To integrate Pathways and similar programs into Med4,
   enhanced outreach, advising, and other support for executing
   scholarly inquiry is needed, likely during the first three years.
g. The scheduling process and structure, and elective leave
   requirements lack the flexibility to accommodate current and
   future needs of students regarding pathways/focused inquiry,
   interviewing for residency, CPx, USMLE Step 2 CS, and other
   career development activities.

2. Advising and Mentorship:
   a. This is also a global issue, as a high proportion of students
      begin Med4 not knowing their specialty choice, suggesting that
      changes made in years 1-3 of the curriculum may be helpful.
      The committee believes that starting core clinical training in
      the third year as opposed to the first two years makes it
difficult for many students to choose a specialty by the
      beginning of fourth year.
   b. While mentorship/advising have improved notably in recent
      years (as judged by the results from the Graduate
      Questionnaire), there is insufficient advising/mentorship in
      several specific areas, including helping students:
      1. Develop and implement fourth year learning
         plans for how they will grow as clinician, leader,
         and scholar;
      2. Identify career goals, including specialty choice
      3. Navigate the residency selection process,
         including interviewing and the match.

3. Evaluation: Learners, Teachers, Programs
   a. Inadequate ongoing feedback and assessment of learner
      growth during Med4, especially with regard to acquisition of
      core competencies.
   b. Tier 1B and Tier 2 electives and associated faculty
      performance are not evaluated with a standardized procedure.
In addition, the quality of these electives is not well monitored due to decentralized oversight.

c. There are less than optimal systems and insufficient central oversight to ensure ongoing improvement of the quality of Med4 electives and courses.

Moving Forward: Proposed Change Framework

A. Define Med4 Purpose: the committee discussed several possible overarching purpose statements for Med4. However, the committee deferred this task pending a clearer statement from the medical school’s leadership regarding the overall purpose of the medical school’s MD program. The purpose of Med4 should be linked to and follow from this overarching purpose.

B. Pending clarification regarding the overall purpose of the MD program, possible goals for Med4 include:

1. Develop as a clinician: achieve competence in all 6 domains (including remediation as necessary) and transition to a more responsible and independent clinical role;
2. Consolidate physician identity and professional role, including the following:
   a. Take responsibility for mistakes, life-long, self-directed learning, role in society, and self-care.
   b. Choose a specialty.
   c. Define a career focus.
3. Develop as a scholar and leader. This may or may not be an overall goal for all MS4s. The committee recommends further discussion as to whether the MD curriculum should require a minimum amount of development in the areas of scholarship and leadership and whether either or both of these categories are important enough to warrant being singled out as overall learning goals.

C. Proposed Changes: The Shorter View:

1. Logistics: Re-assess how electives, especially advanced clinical electives, are organized and defined so as to better support students’ interview schedules and other activities associated with the match and exams such as CPx and USMLE Step 2 CS.
2. **Apply continuous quality improvement principles to ongoing management of Med4. First steps may include:**

   a. Implement standardized evaluation (e.g., Evaluate) of each elective (program and attending), including those currently not evaluated (Tier 1B and 2).

   b. Create oversight mechanism that closes feedback loops and supports ongoing improvements in Med4. This may include:

      i. Central oversight by Office of Curricular Affairs and/or CSSC.

      ii. Program evaluation summaries that are given to those responsible for a given elective/rotation.

      iii. Evaluation data posted online so students may access and factor into their fourth year planning.

   c. Create an online catalogue that includes core information for each elective, including learning objectives, supervision, medical student role, logistics etc…

   d. Create an online ‘digital’ enrollment system that makes adding/dropping electives and wait lists easier and more transparent.

   e. Assess the impact of these proposed changes in Med4.

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**D. Proposed Change Principles: The Longer View**

1. **Develop a competency based curriculum:** Specify the competencies to be attained during Med4 and design the curriculum around these competencies.

2. **Establish a mechanism by which learning plans and individual development plans for each MS4 are goal directed and competency based.**

   a. Each student creates, with an advisor(s), an individual learning plan that specifies how the student will develop as a clinician, and, perhaps, scholar and leader, and then assesses progress toward accomplishing the goals set out in their learning plan. The plan is modified as necessary.

   b. Each student, with an advisor(s), creates an individual development plan for how the student will define a career focus and choose a specialty and assesses progress toward accomplishing the goals set out in their individual development plan, modifying those plans as necessary.
3. **Consider creating multiple concurrent 'components':** Once the purpose of Med4 has been defined and a competency based curricular roadmap created, the committee anticipates that Med4 might best be conceptualized as a set of concurrent 'components' that correspond to essential areas of growth. Every student would have a specific plan, with relative allocation of time to the various components, depending on career goals, for growth in each dimension. The naming and defining of these components will of course depend on the defined purpose of Med4 but may include the following: clinician, physician identity, scholar, and leader. For each component, a minimum set of expectations would be defined for all students. Each student could then expand in those areas that support their overall purpose. With the caveat that some of these components may in the end not be chosen as primary to Med4, key goals and change principles for each component are as follows:

**a. Clinician Component**
   i. Develop increasing independence in the clinical role;
      1. Increase proportion of completed advanced clinical electives that fall under Tier 1A and/or limit the number of two week electives that count toward fulfilling Tier 1B requirements.
      2. Consider a year-long, longitudinal clinical ‘backbone’ experience;
      3. Consider CODA-like or Intersession-like experiences to facilitate growth and acquisition of competencies.
   ii. Achieve proficiency in EBM, advanced clinical reasoning, critical reflection, and system's based approach to error.

**b. Identity as a Physician Component:**
   i. Make specialty choice
   ii. Decide on career focus
   iii. Consider CODA/Intersession like experiences earlier in Med4: role in society, importance of self care, career goals and aspirations, taking responsibility for mistakes and learning from them.

**c. Scholar Component:** if the medical school were to require that all students meet a minimum requirement for scholarship, recommendations include:
i. Enhance integration of Pathways to Discovery into Med4 to promote focused scholarship.

ii. Consider how best to support rigor and growth in scholarship pursued outside of PTD.

iii. The ‘bandwidth’ of this component will vary by student, with some making this a major focus of their fourth year, while others may pursue the minimum.

iv. The minimum expectation for scholarship must be defined.

d. **Leader Component:** this may or may not be a separate area for growth. Either way, each student should have a fourth year plan that highlights growth in this important area.

### 4. Enhanced mentorship and career advising:

a. Create an advising system that would support each medical student in the construction and implementation of their fourth year learning plan and professional development plan. In particular, the advisors would:
   
i. Help the rising MS4 construct an individual learning plan and a professional development plan.

   ii. Help the MS4 assess their progress toward accomplishing the goals set out in their plans and modify those plans as necessary.

   iii. Help the MS4 develop strategies for self-directed learning

b. Enhanced advising around specialty choice and career development, which likely needs to begin much earlier than fourth year, would be more successful if this was accompanied by earlier immersion in clinical training.

c. The committee noted that changes in the curriculum that result in students having substantial clinical training earlier in medical school will help with students choosing their specialty prior to fourth year.

d. The committee also noted that resourcing advising and mentorship will be a challenge. However, (near)-peer mentoring and advising may be able to play an important role in this area as well as small group/cohorted mentoring.
5. **Student Assessment**: Incorporate Med4 into the emerging, longitudinal competency-based assessment system. Optimize system for ongoing assessment of MS4 competence, with emphasis on practice based learning and improvement and advanced clinical reasoning as well as scholarship and leadership. Embed clinician, scholar, and leader competencies in portfolio “modules”.

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