School of Medicine
Undergraduate Medical Education
Curriculum Transformation

Working Group Report Summaries
April 2013

Prepared By:

DAVID HEIL & ASSOCIATES, INC.

Innovations in Science Learning
Introduction

OHSU initiated planning and development to transform their Undergraduate Medical Education (UME) curriculum in mid-2012. Following the appointment of a Curriculum Transformation Steering Committee (CTSC), a number of initial working groups were established to research and provide recommendations on a number of important dimensions of the curriculum. Each working group was chaired by a faculty member/leader and at least one member of the CTSC served as a liaison and participated in the working group's meetings and deliberations. Additional working group members were recruited to provide both a broad base of stakeholder input and/or specific expertise relative to the UME curriculum. Through a series of face-to-face meetings and electronic correspondence, each working group assembled a written report, which was presented by the chair to the CTSC in the first quarter of 2013.

This document provides brief, easy reference summaries of all six working group reports. Because each group formatted their reports differently, the summaries will also vary. In general, each summary will list the leadership and members of the working group, provide a brief summary of their deliberative process, and any specific findings or recommendations as submitted by the group. For copies of each working group’s full report please see the additional files on this site.

The initial working group reports summarized in this document include:

1. Faculty Development
2. Evaluation, Assessment, and Tracking of Students
3. Evaluation of Courses, Clerkships, and Curriculum
4. Teaching Methodologies
5. Integration of Basic & Clinical Sciences
6. Integration of Biomedical Informatics and Technology
7. Competencies, Objectives, and Milestones

It is anticipated that additional working groups will be established as the curriculum transformation process continues. As these groups report on their work, summaries of their reports will be added to this site.
Faculty Development

Chair: Ben Hoffman, M.D. Pediatrics
CTSC Liaison: Allison Fryer, Ph.D., Medicine, Graduate Studies

Members:
Karen Adams, M.D., Obstetrics & Gynecology; Susan Adams, Teaching and Learning Services; Andrea Cedfeldt, M.D., Medicine (general internal medicine); Elizabeth Eckstrom, M.D., M.P.H., Medicine (general internal medicine and geriatrics); Patrice Eiff, M.D., Family Medicine; Sakir Gultekin, M.D., Pathology; Holger Link, M.D., Pediatrics; Vishnu Mohen, M.D., Medical Informatics & Clinical Epidemiology; Mario Padilla, Student, School of Medicine; Lainie Yarris, M.D., Emergency Medicine

Summary
The Faculty Development working group first identified an overall Vision: “OHSU is recognized as a leader in innovative professional development for teaching and educational scholarship.” They then identified seven core areas of professional development for all faculty and seven faculty competencies that all teachers at OHSU should be able to meet. These are itemized below:

Professional Development Core Areas:
1. Scholarship
2. Clinical Skills
3. Navigating Campus Systems
4. Local/Regional/National/International Niche and Reputation
5. Promotion and Tenure
6. Educator Skills
7. Work/Life Balance

Faculty Competencies:
1. Demonstrate adaptive expertise as an instructor, choosing teaching styles, methods, and products to meet learner needs in a variety of venues.
2. Demonstrate general skills with a range of instructional strategies and expertise in at least one area, with an emphasis on practical and experiential learning.
3. Be a reflective educator, capable of assessing the effectiveness and outcomes of their teaching.
4. Engage in professional development leading to positive changes in educational knowledge, skills, attitudes, and expertise.
5. Create learning environments that nurture intrinsic motivation in learners and promote reflective practice.
6. Use assessment tools that are valid, reliable, effective, feasible, and acceptable.
7. Employ methods for assessment, feedback, and evaluation that empower teachers and learners to excel.

The following goals and specific recommendations were identified to actualize their vision.

Goal 1: OHSU has a vibrant, resilient and successful community of educators that includes all campuses and community sites.
    • Develop a “Center for Excellence in Teaching and Educational Development” that includes:
      1. Professional development
      2. Program development and implementation
      3. Constructive faculty assessment and performance feedback
      4. Mentorship/coaching through an Educator Coaching program.
Establish an “Educators Academy” within the Center made up of an interdepartmental community of accomplished educators identified through a highly selective process and working collaboratively to strengthen their own skills while promoting excellence in education throughout the School of Medicine. Academy members would be eligible for travel support to advance their own skills and the mission of the Academy.

Goal 2: OHSU actively supports professional development for educators.
- Allocate dedicated time for faculty to engage in educational scholarship and continued professional development.
- Provide senior faculty time to mentor/coach junior faculty.

Goal 3: OHSU actively supports and rewards Teaching Excellence.
- Develop a meaningful and useful “Educational Value Unit” system allowing educators to receive reasonable and equitable credit and compensation for their educational work.
- Provide recognition, rewards, and incentives (time, monetary) for educational excellence.

Goal 4: Educational strategies, tools, and methods are evaluated in a structured and useful manner across the education spectrum.
- Utilize Quality Improvement methodologies to incorporate a variety of feedback from peers, learners, and patients.
- Link this to Maintenance of Certification programs for Boards certification.

The group also identified a number of needs/gaps that should be addressed going forward:
1. Must have adequate number of faculty to effectively teach all learners.
2. Center for Excellence in Teaching and Educational Development and the Educators Academy should be based on best practices documented at other institutions.
3. Must ensure adequate motivation for teaching and systematically identify and address all “de-motivating” factors.
4. Ensure teachers are effective and efficient, using common language and effective communication, and creating learner-centered environments that optimize learning.
5. Ensure teachers are skilled in reflective practice – clinical, educational, scholarship.
6. Programs should maximally engage learners – small groups, problem-based, innovative – and incorporate inter-professional education.
7. Promote and support ongoing curriculum mapping to reduce redundancy and ensure objectives are met.
8. Measure and study teaching/learning effectiveness and educational scholarship.
Evaluation, Assessment and Tracking of Students

Chair: Nicole Deiorio, M.D. Emergency Medicine

CTSC Liaison: Molly Osborne, M.D., Ph.D., Associate Dean for Student Affairs, Interim Associate Dean for Undergraduate Medical Education; Internal Medicine

Members: John Ansorge, Teaching and Learning Center; Johanna Colgrove, Program Coordinator, M.D./Ph.D. Program, Pulmonary & Critical Care; Tom Cooney, M.D., Medicine (general internal medicine); Lisa Dodson, M.D., Family Medicine, AHEC Director; Sima Desai, M.D., Program Director, Internal Medicine Residency Program; Medicine (hospital medicine); Marian Fireman, M.D. Psychiatry; Jeffrey Gold, M.D., Medicine (pulmonary/critical care medicine); Rebecca Harrison, M.D., Medicine (hospital medicine); Claire Hull, PA-C, Physician Assistant Education; Mark Kinzie, M.D., Psychiatry; Lynn Marshall, M.D., Orthopedics and Rehabilitation; Cynthia Morris, Ph.D., M.P.H., Medical Informatics & Clinical Epidemiology; Morgan O'Connor, Student, School of Medicine.

Summary

In their report, the Evaluation, Assessment and Tracking of Students working group stated their support for competency-based assessment aligned with the ACGME competencies and milestones frameworks, and recognized the need to utilize best practices to ensure each competency is assessed correctly. The group outlined a number of priority areas:

Priority Areas for Assessment: The group highlighted a need for more resources to support:

1. Increasing capacity and budgetary support for OSCE/standardized patient-based assessments for non-medical knowledge competencies.
2. Increasing administrative support for 360-degree evaluations for many of the competencies.
3. Increasing quality of multiple-choice test questions written in Board Exam format.

Priority Areas for Tracking: The group identified the critical need for a longitudinal tracking system to identify trends in student performance, both academically and professionally, including:

1. Software that can work with all schools campus-wide.
2. Support for student portfolios that can be used by the student after graduation.
3. Varying levels of access for different users/viewers.
4. Ease of tracking a student longitudinally and allowing early intervention if needed.

Areas of critical importance:

1. Resources to support faculty monitoring and advising students longitudinally.
2. Increased administrative-staff support to process data and compile meaningful reports.

Further requests/issues identified by the group:

1. Invest in testing facilities/hardware for online delivery
2. Increasing the robustness of the Clinical Practice Exam administered at end of the 3rd year.
3. Further explore Pass/Fail grading options to align with competency-based assessments but ensure that this does not negatively impact students’ competitiveness for their residency.
Evaluation of Courses, Clerkships and Curriculum

Chair: Marjorie Grafe, M.D. Pathology
CTSC Liaison: Pat Brunett, M.D., Emergency Medicine
Members:
Richard Bruno, Student, School of Medicine; Nick Esmonde, Student, School of Medicine; Danette Haynes, LCSW, Psychiatry; Jennifer LeTourneau, D.O., Medicine (pulmonary and critical care medicine); Sarah Melton, Teaching and Learning Center; Carrie Phillipi, M.D., Pediatric; Kamran Sajadi, M.D., Urology; Clare Wallner, M.D., Emergency Medicine; Laura Zeigen, OHSU Library

Summary
The Evaluation of Courses, Clerkships and Curriculum group provided seven recommendations to the Curriculum Transformation Steering Committee regarding structure and personnel:

1. **A detailed, accessible, and flexible curriculum map** based on goals and objectives for the curriculum as a whole and for topics, courses, clerkships. The map should be accessible to faculty for longitudinal integration across the curriculum and students for self-assessment.

2. **The SOM Curriculum Committee (CC), working with the SOM Deans, should oversee the overall content and structure of the curriculum.** The CC should be strengthened and include basic science and clinical faculty members, professional educators, and be led by an individual designated and supported by the Dean.

3. **Specific content of all UME courses and clerkships should be determined by the faculty who teach these offerings.** They should adhere to the curriculum map and should receive support from both the Dean’s office and their individual departments for this work.

4. **A single entity should be designated and empowered to review the content of the curriculum for vertical integration, guided by the curriculum map and objectives.** This could be the CC, but should involve more members than just the course directors.

5. **Each course/clerkship should have an active Course Committee** to regularly evaluate the course/clerkship objectives, content, teaching formats, and methods of assessment, and regularly report the results of self-evaluations to the CC.

6. **A variety of methods should be used by the course committees and the CC to evaluate courses, clerkships, and the curriculum as a whole.** Evaluations should be linked to student progress and achievement of objectives, occur at regular intervals during each course/clerkship, and should allow students to self-assess.

7. **Each student should have a faculty advisor who follows his/her progress over time.** When possible, a student’s program would be individualized based on achieving competency milestones.

**Technical resources needed:**
- Technology and software for curriculum mapping, tracking, evaluation and student self-assessment.

**Key personnel needed:**
- Curriculum map manager.
- Curriculum leader designated by the SOM Dean.
- Faculty support/time for educational activities, including professional development.
- An individual to follow up with OHSU graduates and their residency program directors.
Teaching Methodologies

Chair: Brett White, M.D. Family Medicine
CTSC Liaison: Tracy Bumsted, M.D., Pediatrics

Members:
Tom Becker, M.D., Ph.D., Public Health & Preventive Medicine; Curtis Bergquist, Student, School of Medicine; Tom Boudrot, Teaching and Learning Services; Judith Bowen, M.D., Internal Medicine; Mark Hattenhauer, M.D., Internal Medicine; Dave Jones, M.D., Emergency Medicine; Pat Kenney-Moore, M.S. PA-C, Physician Assistant Education; Selena Liao, M.D., Otolaryngology; Laurel Murphy, Public Health & Preventive Medicine; Kerry Rhyne, M.D., Internal Medicine; Teresa Worstell, Student, School of Medicine

Summary
The Teaching Methodologies working group considered existing educational research, ideas from the Curriculum Transformation retreat and the recently approved Guiding Principles (posted elsewhere on this site) to inform their discussions and recommendations. To frame their report they referenced a number of items found in the literature regarding adult learning and effective formats for teaching and learning, including:

Adult Learning Principles
1. Adults are problem-oriented and motivated to learn when they have a high need to know.
2. Adults are independent, take responsibility for their lives, and are increasingly self-directed.
3. Adults approach learning with a great number and variety of previous experiences.
4. Readiness to learn results from real-life problems, personal development and changing roles.
5. Adult learning is self-centered rather than subject-centered.

Seven Principles of Successful Undergraduate Classrooms
1. Contact between students and faculty
2. Reciprocity and cooperation among students
3. Active learning
4. Prompt feedback including reflection and self-assessment
5. Emphasis on time-on-task and the skills of time management
6. Communication of high expectations
7. Respect for diverse talents, backgrounds, and learning styles

While lectures are currently the predominant medical school instructional strategy, they are less than exemplar in terms of effectiveness and engagement. Active learning, wherein students learn by both doing and thinking about what they are doing, is the preferred approach.

In their final report, the working group’s recommendations addressed three areas: instructional strategies and active learning, faculty buy-in for new methodologies, and needed resources. They categorized each recommendation as one of the following: the “minimal” acceptable approach, an “enhancement” to the basics, or the “ideal” approach.

Recommendations to address instructional strategies and active learning:
In their first set of recommendations, the group distinguished between the early years of medical school (early clinical education) and the later years of medical school (advanced clinical education).
Early clinical education core foci: A) Promote knowledge acquisition in ways that facilitate recall when this knowledge is needed for solving clinical problems. B) Promote critical thinking about scientific advances in medicine.

1. Support collaborative biomedical-clinical teaching partnerships to develop and implement basic science courses with clinical context throughout the curriculum (ideal)
2. Incorporate active learning into all components of the curriculum (enhancement)
3. Provide students with multiple opportunities to self-test with immediate performance feedback, without penalty, to help students gauge learning progress prior to high stakes examinations (ideal)
4. Pilot testing of the “flipped classroom” should be initiated by well-supported faculty champions, best practices developed and subsequently implemented in increasingly significant portions of the curriculum (ideal)

Advanced clinical education core foci: A) Promote active learning from direct patient care. B) Promote deeper understanding of the applications of biomedical knowledge to clinical problems, diagnostic, and clinical reasoning. C) Promote deeper understanding of health systems, patient safety, and continuous improvement.

5. Support students’ transition from highly supervised clinical learning to appropriate and earned autonomy in clinical activities (minimal)
6. Standardize expectations for independent study that builds clinical knowledge structures for retrieval and transfer (minimal)
7. Revisit basic science learning for deeper understanding and application (enhancement)
8. Engage students in medical error/patient safety activities (enhancement)

Recommendations to address faculty buy-in for new methodologies:

1. Identify motivated and engaged faculty from the pool of OHSU faculty (minimal)
2. Acknowledge and reward teaching faculty; early adopters are equally acknowledged and rewarded (minimal)
3. Invest in adequate faculty (teacher) development (minimal)
4. Provide ongoing feedback from students, peers, and course directors, to all instructors with incentives and rewards to encourage excellence (enhancement)

Recommendations for needed resources:

1. Computer technology–recording equipment, servers, adequate staff support (enhancement)
2. Financial commitment to educators–compensation, incentives (minimal)
3. Classrooms that enable - computer access at all times, small group activities (minimal)
4. Simulation investment–adequate space and equipment, faculty expertise (enhancement)
5. Investment in Instructional Designers – multiple resources for learning, ensure equivalent content coverage regardless of modality of delivery (print, online, web-streamed, etc.) (ideal)
6. Student resources–“learning style inventory” (enhancement), additional self-assessment tools (minimal), web-based learning (minimal)
7. Ensure adequate clinical preceptors for all clinical experiences and rotations (minimal)
8. Ensure adequate availability of patients for all clinical experiences and rotations (minimal)
9. Adequate resources to engage in thorough statistical analyses of the new curriculum and curricular components to ensure effectiveness
Integration of Biomedical Informatics and Technology in the Medical Curriculum

**Chair:** Paul Gorman, M.D. *Medical Informatics and Clinical Epidemiology*

**CTSC Liaisons:** Jeff Kraakevik, M.D., *Neurology*; Donn Spight, M.D., *Surgery*

**Members:**

**Summary**
The Integration of Biomedical Informatics and Technology working group organized themselves into four separate teams to develop findings and formulate preliminary recommendations, which were then reviewed by the entire working group and student volunteers from the most recent four classes. For additional input the group surveyed 30 course and clerkship directors to assess current uses of technology. The full report from this working group has been posted elsewhere on this site.

Itemized below are high level findings or patterns identified by the various subgroups that informed their thinking about recommendations and future directions.

**Technology Findings**
1. Extensive use of technologies throughout OHSU but without a coordinated or coherent approach to managing digital resources and methods across departments and/or courses.
2. Many instances of early adoption of new technologies but faculty generally working in isolation without coordinated support or evaluation.
3. Widespread use of student-sourced, non-OHSU resources, spread by word of mouth and social media but often used at substantial cost to students.

**Informatics Findings**
1. Most of the identified training in informatics in the first two years of the curriculum pertains to EHR or literature search and is limited and introductory in nature.
2. Most EHR learning happens informally during clerkships and the burden of this learning reduces direct contact time with patients.
3. Informatics education in the clinical years may be somewhat more extensive but is not well identified and appears to be widely dispersed without coordination or coherence.
4. Education in informatics knowledge and skills relevant to the “Learning Health Care System” as envisioned by the Institute of Medicine is strikingly absent at OHSU.

**Best Practice Findings**
1. Biomedical informatics education in undergraduate curriculum is in nascent state but promising models exist.
2. Numerous examples of technology in medical education have been published but there is little published evidence upon which to base purchase or implementation decisions.

**Group Recommendations**

After developing and reviewing subgroup reports, the full working group met to develop group recommendations in three areas – Technology Integration, Biomedical Informatics, and Faculty Development. These recommendations were prioritized into two categories: *Essential* – bare minimum to be credible in 21st Century medical school; and *Desirable* – necessary for an informatics aware, technology-enabled medical education.

**Technology Integration**

*Essential*

1. Adaptive Infrastructure–A technology adoption infrastructure that can adapt to changing needs and capacities as the educational landscape and delivery mechanisms evolve.
2. IT Integration with education and scholarship–IT personnel must be more connected to and distributed among faculty and students and thereby be familiar with local needs and solutions, using a librarian liaison model rather than vendor of services model.
3. Anywhere, Anytime Access–Educational resources and data should be accessible to students and faculty anywhere, anytime, on any device.
4. Current software–Individuals should not be confronted with “outdated browser” or similar messages when using School of Medicine devices.

*Desirable*

5. Big Simulation–Wide scale, far reaching simulation, in use across the entire curriculum, providing virtual settings and experiences for learning and practice from basic science through clinical procedural skills, team training, and judgment and decision making.
6. Expanded Virtual Presence–Resources and interaction with the OHSU community and infrastructure should be available 24/7. Continuity between on-campus and online learning.
7. Coordinated Access–The best resources for learning, on and off campus, whether identified by students or faculty should be available through a centralized mechanism, dynamic to respond to changing requirements, student needs and preferences, and resource quality.
8. Dedicated specialists in educational technology–Looking inside and outside the OHSU for best practices, introducing and supporting innovations.
9. Competency dashboard and database–Competency based curriculum with everything a student does, from taking written exams to getting feedback on a procedure logged via a computing device into a common database. This allows the student to see exactly where he/she stands at any time in relation to target competencies and milestones via his/her mobile device. On the administrative end, instructors able to monitor student progress in real time. Algorithms automatically detect when a student is trending down in terms of competency attainment, with the data system automatically sending the student and student’s advisor an alert that they need to meet.
10. Seed funds for pilot projects–Modest funds and expert educational technical help to support adoption and evaluation of technology innovation and integration in curriculum
11. Multi-format content delivery–Educational content should be available in multiple formats to facilitate flexible, individualized learning (e.g. mp3, podcasts, video, text, etc.).
12. University Licensing–A broader set of software, capabilities, and knowledge resources should be university licensed to reduce current out of pocket burden on students.
13. Long Term Monitoring–Monitor alumni outcomes and perspectives to inform adjustments to educational goals, technologies, and instructional strategies.

14. Student participation–Students should be involved in every phase of group identification, vetting, and recommendation of future resources to harvest both their perspectives and their experience.

Biomedical Informatics Education

**Essential**

1. Required informatics experience–OHSU must introduce some biomedical informatics education for all students. An MS4 ‘back to classroom’ model or MS1/2 informatics block would be a minimum

2. Define informatics–Every student (and mentor) should be able to define biomedical informatics and understand its relevance to 21st Century health care.

3. Critical thinking about technology–Students need to learn to critically evaluate information technologies they are using and the impacts, good and bad, on education, research, and patient care.

4. Critical thinking about data–Students need to understand principles and limitations of performance measurement and quality improvement methods.

5. Technology Competencies–All students meet minimum competencies with technologies at matriculation then build skills and knowledge to meet defined competencies.

6. EHR competence–Every student should be prepared to use the current EHR, and prepared to adopt and adapt future technology.

7. EMR training–Students should be facile with EHR use prior to intensive clinical work so learning EHR does not interfere with patient interaction on clerkships

8. Evidence Based Medicine–Students need EBM and knowledge management skills to become savvy consumers of information, going beyond mere access to the ability to appraise and apply evidence to patient care, population management, systems improvement

9. Benefits and harms of technologies–Students need to be aware of beneficial and potential harms of information technologies, such as adverse effects of automation, proper use of copy and paste, etc.

10. Meta-cognitive skills–Reflective practitioners who know what they don’t know.

**Desirable**

11. Put the pieces together–Numerous bits and pieces of informatics are scattered throughout curriculum need to be brought together into a coherent whole.

12. Cross-pollination–Much greater interaction is needed between students and faculty familiar with and practicing informatics (in DMICE and elsewhere).

13. Leadership–Importance of informatics and information in medicine should be visible from the top down (e.g. Dean Richardson’s four pillars of curricular transformation).

14. Longitudinal integration–Informatics topics should be threaded throughout the four-year curriculum. (See new model at Arizona State University).

15. Just In Time Information Mastery–‘Just in case” memorization is no longer sufficient and future physicians will need greater skill at accessing and navigating diverse information resources for up to date information about care.

17. Process improvement–Principles of process improvement, systems thinking, and human factors will be key skills for future physician leaders.
18. Collaboration–Future physicians will need to be facile with technological interconnection and collaboration with patients, consultants, colleagues, decision support.
19. Aware of clinical informatics–Non-specialists will need to understand the proper role and functions of this emerging clinical subspecialty.
20. Medicine as an information science–Students and faculty need to recognize and support the fact that medicine is now an information science.
21. Patient participation–Future physicians will need to be able to take full advantage of the emerging array of consumer and patient technologies for communication and monitoring at home.

Faculty Development

**Essential**

1. Reward innovation–Innovations in biomedical informatics and technology should be included in annual reviews and promotion and tenure deliberations. Celebration of successes should be publicly shared.
2. Faculty development expectation–To grow and strengthen faculty capabilities faculty development should be an expectation, maintained as a line item in annual reviews, and not ad hoc, intermittent, or optional.

**Desirable**

3. Foster sharing and collaboration–Formal and informal means of sharing innovations, experiments, and success stories need to be created and sustained. The means should exist for others on campus to learn of, and learn from, these efforts.
4. IT-Faculty Interaction–Regular close interaction of technology support with faculty that includes mentoring, support, networking, and a reward system.
5. Faculty Development–Build informatics topics and technology innovation into faculty development program.
6. New faculty support–Support learning and innovation by new faculty.
Integration of Basic and Clinical Sciences

Chair: David Jacoby, M.D. Medicine

CTSC Liaisons: Beth Habecker Ph.D., Physiology & Pharmacology; William Skach, M.D., Biochemistry & Molecular Biology

Members:
Nels Carlson, M.D., Orthopedics & Rehabilitation; Dawn Dillman, M.D., Anesthesiology & Perioperative Medicine; Tonja Dirks, M.D., Medicine (nephrology and hypertension); Dennis Koop, Ph.D., Physiology & Pharmacology; Claudio Mello, M.D., Ph.D., Behavioral Neuroscience; Susan Olson, Ph.D., Molecular & Medical Genetics; Peter Rotwein, M.D., Biochemistry & Molecular Biology; Allison Stickles, Graduate Student, Physiology & Pharmacology; Megan Troxell, M.D., Pathology; Ryan Van Woerkom, M.D., Medicine (general internal medicine); Gary Westbrook, M.D., Neurology, Vollum Institute; Cezary Wojcik, M.D. Family Medicine

Summary
The Integration of Basic and Clinical Sciences working group met five times as a group in addition to considerable emails. Members also reached out to colleagues at other medical schools to solicit ideas and comparisons and reviewed articles on medical school curriculum reform. They based their recommendations on the following six principles:

1. **Integrate** basic science learning with clinical learning, decreasing redundancy in the basic sciences and increasing clinical relevance at all stages.
2. **Emphasize** critical assessment of primary medical literature throughout all four years.
3. Provide more **flexibility** in the curriculum to allow for a more student-centered course of study. This may mean removing some of the basic science in years 1-2 and revisiting select science topics in years 3-4 as they apply to clinical experiences.
4. **Redistribute** of some basic science curriculum. See explanation in #3 above.
5. Required **scholarship** for students to incorporate basic and clinical science through a capstone or mentored project over extended time.
6. Emphasize clinical and basic science correlations throughout all four years.
7. Instruction by paired clinical and basic scientists.

**Recommended Elements** to include in the revised curriculum:

- **A leadership team** of a clinical and basic scientist should be appointed to oversee the development, implementation, and continual revision of the basic science curriculum.
- **Reallocation**: **about 6 months of time** from year 1-2 basic sciences to allow for earlier engagement in clinical experiences and then revisiting relevant science content in years 3-4.
- Incorporation of a **Medical Foundations** course at the beginning of year 1 to introduce basic and translational science concepts needed to understand subsequent course material.
- Organize the first 18 months around **organ systems** with basic and clinical sciences integrated using sample clinical cases.
- Increased **interactive learning** in class by posting lectures and/or assigned readings online for student access in advance of class.
- **A capstone project** required for every student that involves a four-year scholarly project with a faculty mentor.
- **Intersessions** scheduled for one week in between each clerkship block during the 3rd year. Students would return to OHSU for these sessions with possible topics recommended by the various clerkship sites from which the students have just completed a rotation.

- **Establish additional advanced clerkships and electives** during the 4th year, allowing students to design a course of study appropriate to their own career goals. Examples are:
  - Anatomy with intensive cadaver dissection
  - Histology and histopathology
  - Molecular medicine
  - Clinical pharmacology and advanced physiology
  - Research design, grant writing, advanced biostatistics
  - History and philosophy of medicine, ethics
  - Primary care, community and/or rural health
  - Tropical diseases, global health, neglected diseases

- **Frontiers in medical science** courses offered during the last 18 months of medical school that focus on broad medical topics rather than a single case study. Envisioned as small size, intensive 1 week courses taught by a physician scientist or basic and clinical science team who are nationally recognized experts in the specific topic.
Competencies, Objectives and Milestones

Chair: Tom Cooney, M.D. Internal Medicine
CTSC Liaisons: Pat Brunett, M.D., Emergency Medicine; Tracy Bumsted, M.D., Pediatrics
Members:
Karen Adams, M.D., OB/Gyn; Ethen Beckley, Student, School of Medicine; Fran Biagioli, M.D., Family Medicine; Ken Gatter, M.D., Pathology; Rebeca Harrison, M.D., Internal Medicine; Merritt Hoover, Student, School of Medicine; Karen Kwong, M.D., Surgery; Lauren Monetta, Student, School of Medicine; Jonathan Purnell, M.D., Internal Medicine; Sue Richards, Ph.D., Genetics; Buddy Ullman, Ph.D., Biochemistry & Molecular Biology

Summary
This working group reviewed the current/published OHSU UME Program Core Competencies and Objectives. In particular, the group focused on evaluating each competency for clarity and language that would define clearly an expected outcome that could be aligned with a specific assessment. The group also considered whether there were important competencies missing. The overall goal will be to assure a clear understanding of the competencies by both faculty and students. The group recommended some minor changes in language and completed an exercise to rank order a list of 31 competencies and objectives (subcompetency). The chart below summarizes this rank-ordered list with numbered objectives corresponding to the current set for easy reference. Finally, the group strongly recommended that the SOM develop a robust, high-stakes assessment system closely aligned with any new set of Competencies and Objectives.

<table>
<thead>
<tr>
<th>Competency</th>
<th>Milestones</th>
<th>Rank Order (1=highest; 31=lowest)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. PATIENT CARE &amp; PROCEDURE SKILLS</strong></td>
<td>MS1</td>
<td>MS2</td>
</tr>
<tr>
<td>Subcompetency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Obtain an accurate history, covering essential medical, personal, and socioeconomic considerations.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. Perform accurate physical and behavioral health examinations appropriate to patient presentation.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3. Construct a prioritized differential diagnosis for common presenting complaints.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>4. Construct and present a clinical assessment and treatment plan.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6. Demonstrate the use of information technology for the retrieval and application of biomedical information in clinical problem-solving and medical decision-making.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Order, interpret and apply information from diagnostic imaging, laboratory tests and pathologic evaluations of common conditions.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>11. Perform and document common diagnostic and therapeutic procedures.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Competency</td>
<td>Milestones</td>
<td>Rank Order (1=highest; 31=lowest)</td>
</tr>
<tr>
<td>------------</td>
<td>------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td><strong>B. MEDICAL KNOWLEDGE</strong></td>
<td><strong>Subcompetency</strong></td>
<td>MS1</td>
</tr>
<tr>
<td>1. Identify the normal anatomy, histology, and embryology of major tissues, organs and organ systems.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. Explain the normal development and physiology of major tissues, organs and organ systems of the human body.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3. Explain the biochemical, molecular, and cellular mechanisms important for maintaining homeostasis.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>4. Explain the principles of medical genetics and their application to the clinical practice.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>5. Explain the major molecular and cellular mechanisms of disease and explain how they alter the normal anatomic and histologic structures of major organs and organ systems.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6. Explain how disease alters the normal functions of the major organ systems of the body.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Explain the scientific basis of normal and abnormal human behavior.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Explain the basic principles of pharmacology.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>9. Identify the clinical indications for commonly used therapeutic agents.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>10. Identify the actions, interactions and toxicities of commonly used drugs.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>11. Identify the risk factors for acquiring common diseases and prognostic factors for adverse outcomes.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>12. Explain the normal physiologic and psychosocial characteristics, and the common pathologic processes, of human growth, development and aging.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Apply basic principles of clinical, laboratory, and imaging tests for clinical screening and diagnosis, and critically evaluate their limitations.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>15. Demonstrate the ability to critically evaluate and interpret scientific and medical literature and to apply findings to clinical situations.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>17. Explain and apply effective clinical approaches to prevention and early detection of common diseases.</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
### C. PRACTICE-BASED LEARNING & IMPROVEMENT

<table>
<thead>
<tr>
<th>Subcompetency</th>
<th>Milestones</th>
<th>Rank Order</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MS1</td>
<td>MS2</td>
</tr>
<tr>
<td>1. Continually self-assess one’s strengths and areas for improvement, and pursue a plan for improvement.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3. Formulate relevant questions and utilize appropriate resources to answer them.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>4. Interpret and appropriately apply practice guidelines in the diagnosis, treatment and prevention of disease.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Demonstrate skills necessary to support independent lifelong learning and ongoing professional development.</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

### D. INTERPERSONAL & COMMUNICATION SKILLS

<table>
<thead>
<tr>
<th>Subcompetency</th>
<th>Milestones</th>
<th>Rank Order</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MS1</td>
<td>MS2</td>
</tr>
<tr>
<td>1. Demonstrate effective listening and speaking skills when communicating with patients and their families.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4. Demonstrate effective written and verbal communication with all members of the health care team.</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

### E. PROFESSIONALISM

<table>
<thead>
<tr>
<th>Subcompetency</th>
<th>Milestones</th>
<th>Rank Order</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MS1</td>
<td>MS2</td>
</tr>
<tr>
<td>5. Demonstrate honesty and integrity in all interactions with patients, patients’ families, and members of the health care team.</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

### F. SYSTEMS-BASED PRACTICE

<table>
<thead>
<tr>
<th>Subcompetency</th>
<th>Milestones</th>
<th>Rank Order</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MS1</td>
<td>MS2</td>
</tr>
<tr>
<td>3. Explain a systems approach to assuring patient safety, including methods to improve safety and reduce medical errors.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Explain the role of quality measures and population-based data in improving patient care.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>