

## **Module Review**

### **Fundamentals I**

**Course Director:** Laura Cotlin

**Clinical Co-director:** Nat Robin

**Course Date:** August 18<sup>th</sup>-October 17<sup>th</sup>, 2008

**Review Date:** March 3<sup>rd</sup>, 2009

<b>Present:</b>	<b>Cathy Fuller</b>	<b>Chair, Pre-clinical Sub-Committee</b>
	<b>Ivan Maya</b>	<b>Pre-clinical Sub-committee</b>
	<b>Laura Cotlin</b>	<b>Course Director</b>
	<b>Amanda Burns</b>	<b>Co-Chair, Student Evaluation Committee;</b>
		<b>Pre-clinical Sub-Committee</b>
	<b>Lindsey Smith-Hinton</b>	<b>Co-chair, Student Evaluation Committee;</b>
		<b>Pre-clinical Sub Committee</b>
	<b>Gwen Weatherspoon</b>	<b>Student Course Representative</b>
	<b>Merrill Stewart</b>	<b>Student Course Representative</b>
	<b>James Jackson</b>	<b>UME</b>

#### **Review Process:**

The module review process consists of three parts; the self-study conducted by the course directors with the aid of UME, the review, i.e., the face-to-face meeting between representatives of the pre-clinical sub-committee of the MEC, the student representatives and the course directors (the review committee) and the final part, the report to the Pre-clinical sub-committee and thence to the MEC. The review committee received the self-study material approximately 3 weeks in advance of the meeting. Below is a summary of the face-to-face meeting, highlighting strengths and weaknesses of the course and outlining areas for improvement. This is followed by the detailed report, which provides the rationale for the recommendations and overall evaluation.

#### **Summary:**

Fundamentals I was a successful module, due in no small part to the commitment of the module directors and a strong and supportive faculty. Some areas that were problematic during the course were circumstance driven and/or policies enacted by the Module Directors Committee and thus outside the immediate control of the Fundamental I course directors. Others form the basis for recommendations for improvement as listed below. In general, Fundamentals I achieved its overall goal of providing a suitable introduction to the basic sciences required for the future modules.

#### **Strengths:**

The two directors are seen as a major contributing factor to the success of this module

Strong and accessible lecturers and preceptors

Patient presentations

Overall module organization

Small groups

**Weaknesses:**

Paper exams that did not permit immediate question review by students

Disorganized anatomy labs and difficulty for whole class to participate fully in histology labs.

Didactic ethics lectures.

**Recommendations for Improvement:**

Develop module-level objectives

Switch from paper to computerized exams and endeavor to increase percentage of questions that meet NBME technical standards to reach benchmark of 70%.

Begin to develop a practice question bank specific for this module.

Increase organization of anatomy, provide focused learning objectives for this subject, and switch histology labs to lecture theater for easier viewing of slides by whole class in a single location.

Consider increasing representation of physiology and integrate some lectures more e.g. biochemistry with function of vitamins and clinical effects of vitamin deficiencies.

Consider re-structuring ethics lectures, possibly to include a clinical preceptor/lecturer.

Move towards reducing student contact hours to approach benchmark of < 20h per week.

Encourage lecturers to switch to PowerPoint slides from other modes of instruction.

Re-evaluate role of projects in this course and consider adjusting their implementation and/or requirements.

Recommendation:

Fundamentals I is a strong module that more than adequately fulfills the requirements for an introductory module in the basic sciences. It is recommended that this module be subject to full review in three years time and expedited review (to note implementation and effect of changes to the course) in the intervening period.

## **Report of Fundamentals I Review Committee Meeting, March 3<sup>rd</sup> 2009**

All six of the self-study areas were reviewed in order.

### **Module Objectives and Content**

Fundamentals I did not provide module objectives, so direct correlation of objectives with Fundamentals I activities was not possible. Activities were therefore correlated as closely as possible to UASOM objectives. Several UASOM objectives, and the accompanying ACGME competencies focus on clinical parameters, e.g., compassionate treatment of patients, which are not strictly applicable in the context of Fundamentals I, so the review committee focused on those that Fundamentals I could reasonably be expected to address, e.g., “Understand normal human structure and function...”. Of these, objectives relating to communication, biomedical knowledge were mostly fulfilled; while a single item under Objective 5 (“Each student will demonstrate sound clinical judgment...”) was partially fulfilled. Three other objectives relating to patient good, differential diagnosis and social factors affecting patient health, were not addressed and were not applicable to Fundamentals I.

In terms of content, topics taught by Fundamentals I covered the vast majority of subjects listed under “General Principles”, “Biology of Cells”, “Human Development and Genetics”, with some contribution to topics listed under the organ modules, particularly relating to organ structure and function. Significant overlap with the organ modules was limited and not considered to be a problem. The addition of Anatomy was a benefit, although organizational problems (see below) hindered the learning experience for some students. Fundamentals I successfully incorporated material from three of the five SOM themes into the course, including elements from “Translating Evidence into Practice” which was covered by four lectures on “Evidence Based Medicine”, “Special Populations” covered by a lecture relating to Geriatrics (“Biology of Ageing”), and “Professionalism and Ethics”, which was covered by 4 lectures on various ethical issues in current medicine. The “Clinical Skills” and “Patient Interactions” theme are not applicable to Fundamentals I. While incorporation of these themes was useful, it was suggested that inclusion of EBM in Fundamentals I is too early in their medical school careers for most students to get much out of it, while it was felt that the Ethics content was too didactic – this point is addressed further below. Overall, Fundamentals I did a good job of addressing objectives and content as they relate to the basic sciences; no significant redundancies or omissions were noted at this stage.

### **Methods of Instruction and Assessment**

All of the material relating to SOM objectives that relate to Fundamentals I were covered by lecture, small group, labs or a combination of these activities. As might be expected, the vast majority (over 90%) relate to the “Biomedical Knowledge; Normal Structure/Function” and “Causes of Disease” objectives. 85.5% of this material was covered by lecture, which is above the 2010 benchmark of 50% lecture; however this benchmark may be unrealistic for Fundamentals modules, given the nature of the material. In five weeks of the nine week module, total student contact hours (including ICM) exceeded the 20 hour/week benchmark, with one week having 25 hours of student contact time. In the course of the Review Committee meeting, several organizational issues affecting aspects of the course were discussed. These are summarized below:

*Anatomy:* The anatomy labs while appreciated were noted by module director and students to be somewhat chaotic. This was due in large part to a last minute change in faculty availability to set up and organize the labs and was thus outside the control of the module directors. It was suggested that more clearly labeled structures in the cadavers, and cadavers organized separately to show nerves, vessels, organs etc. would help, as would having the anatomy lectures more closely correlated with the laboratories. It was also suggested that the instructional level was too advanced for this beginning class. Other student-driven suggestions included having a project in anatomy where a small group could identify structures and/or design an anatomy practical and then swap “exams” with another group to take that practical, a better integration of anatomy and histology, and spreading anatomy throughout the course. However, probably the biggest problem was a lack of instructors/demonstrators.

*Histology:* In general the histology labs suffer from the physical constraints of not being able to accommodate all of the students within a single laboratory. This means that in a laboratory where the microscope image is slaved, the learning environment is compromised due to noise and inability of the students to interact directly with the instructor. This reduces the effectiveness of the histology labs. Furthermore, the module director commented that very few students checked out the slide boxes to examine tissue sections for themselves. The module director feels that it is important that students learn how to use a microscope and be given access to them. It was thus suggested that the labs be conducted in the lecture theater, with the microscope image projected on the screen in front of the whole class, while small groups could perhaps be organized to examine individual slides.

*Ethics:* The ethics lectures were thought to be too didactic, with not enough weight given to alternate perspectives surrounding an issue. It was suggested that including a clinician in these sessions might be helpful to provide a “real world” perspective on the issues under discussion.

No information was available for module review standards 2.4 (Activities are problem-based), 2.5, (Interactive lectures), 2.6 (Information concerning integrative thinking of small groups), or 2.7 (System for evaluation of student achievement uses a mix of traditional and authentic/alternative assessments).

Small group assessment used the “professional” evaluation form as preceptors had more than 4 hours of contact with students. Despite changes from the previous year it is still felt by the students that small group grades are very preceptor dependent and are very subjective, with expectations of preceptors for the students not being very clear. One additional student comment was that lectures/transcripts did not correlate well with small groups in terms of timing and that this placed some students at a perceived disadvantage. The suggestion was that small groups should carry less weight (in Fundamentals I, the small group component was 15% of the total grade). However no Fundamentals I student failed the small group component.

*Exams:* On the exams, multiple choice questions accounted for 71% of knowledge component but 50% for final tabulation (above benchmark of <50%). The exam reliability coefficients for the 2008-2009 class were between 0.79-0.81, which falls within the parameters of moderate reliability. The percentage of questions in NBME format were 21% on Exam I, 18% on Exam II and 26% on Exam III. The benchmark is to obtain 70% of questions in NBME format by 2010. The average number of questions

per lecture hour was 3 and the majority of lectures had questions associated with them on the exams. In terms of Step 1 content area, topics relevant to Fundamentals I were adequately covered. Some topics did not exactly line up with the Step1 content area and were therefore "Unclassified"; however, these were a minority.

Other assessments included laboratory practicals, student group presentations and an evidence-based medicine assignment, all of which seem to be appropriate.

### **Student Outcomes**

The required attendance for Fundamentals I was set at 80%; this was met by the entire class only for Week 3 of the course, although on average nearly 80% of the class attended 80% of the lectures over the duration of the course. However, attendance is still a major bone of contention with the students, with many students feeling that they are being unfairly discriminated against and strongly suggesting a reduction in the required attendance. In general, the reasons why attendance is required needs to be further clarified and explained to the students.

Module raw score means for the class of 2008 (86.3) and 2007 (86.7) are slightly lower than the raw score means for all modules combined (88.3 in 2008 and 88.1 in 2007). In terms on individual exams, the raw score (2008) for Exam I was 75.3, for Exam II, 80.8 and for Exam III, 84.3. The overall knowledge performance mean was 83.2 in 2008 and 82.7 in 2007. Individual group/performance mean was 93.8 in 2008 and 96.1 in 2007. Two students failed Fundamentals I in 2008; this compared with 5 failures for this module in 2007. All other scores were comparable. However, information to correlate these outcomes with the national means was not available.

### **Student Evaluation of Module**

The student evaluations of Fundamentals I were comparable to those of the other modules. 88% of students graded the module as good or outstanding, up from 50% in 2007.

For the module specific items, at least 75% of students indicated that the emphasis was about right for all module components in 2008, except for Physiology and Behavioral Science where 45% and 35% of the class, respectively thought there was too little emphasis. At least 61% of students think that the module activities listed are moderately or very helpful. The largest percentages rating an activity "not helpful at all" are for Quizzes (31%) and Group Presentations (47%). In 2007, 39% thought that the Diabetes Small Group was not helpful; this activity was cut in 2008.

Several items were of concern to students:

Closed Exam Policy: Overall this elicited the greatest number of complaints, with only 25% of students agreeing or strongly agreeing that adequate feedback was provided. This result is due to three probable causes: a) the exams in Fundamentals I were paper-based rather than computer-based, so students did not get an immediate review of questions that they missed on the exams and with the closed exam policy did not have the opportunity to review exams in the LRC; b) objectives/Step 1 content areas that were linked to questions were insufficiently detailed to be of help; c) students do not understand the rationale for the closed exam policy and the necessity to develop a bank

of reliable questions, which may take several years to establish. An additional and emerging problem, not specific to Fundamentals I is that there seems to be some ambiguity between modules as to how this policy is employed. It was suggested that improvements could be made by a) explaining to the students the necessity for a question bank; b) providing multiple practice questions to which students could have free access; c) tying objectives/Step 1 content outlines more tightly to questions and providing more detail; d) all modules be consistent in their methods of question/exam review

Implementation of ARS also continues to be a problem. The item "ARS made me more likely to prepare for class" fell below 3.0 (2.6) and 50% (16%) in terms of percentage of students agreeing or strongly agreeing with the statement. One issue concerns lecturers who are unfamiliar with ARS and who get into difficulties when trying to use the system. It was suggested that all lecturers receive training in the technical aspects of ARS and that module directors in general need to be present during the lecture and need to be familiar enough with ARS to rescue a lecturer if needs be.

Other items of student concern were "projects", (group presentations and evidence-based medicine assignment); 50% of students disagreed that these facilitated their learning and most thought that these took too much time; and "independent learning" that also received less than 50% agreement – students thought that this placed too much responsibility on them.

Based on the 2008-09 Nominal Group Technique (NGT) results for two student groups, students think most strongly that learning could be improved by reviewing test questions after the test, adding more structure and organization to anatomy labs, eliminating the attendance policy, removing excessive detail from lectures, making lectures more clearly build on one another and making preceptor expectations more consistent across groups. Students identified study days and lighter load before Friday exams and the support, availability and responsiveness of the module directors as most helpful for their learning.

### **Evaluation of Lecturers and Preceptors**

The overall quality of the faculty is rated Excellent or Satisfactory by 98% of the students in 2008, as compared to 84% in 2007. One lecturer had an evaluation score of 2.9 (Occasionally fails to meet expectations), as compared to three lecturers in 2007, the vast majority of lecturers falling between 3 and 4 (meets expectations and exceeds expectations).

No small group preceptor fell below a mean of 4 (satisfactory) and no one had more than 50% of ratings at less than 4.

Some lecturers in Fundamentals I were difficult to understand/follow in class either because of presentation style (mumbling, accent), or because audio-visual aids were difficult to follow (e.g., acetate overheads as opposed to PowerPoint slides). In addition, some lecturers persist in comparing (unfavorably) the old and new curricula, especially with regard to the time available for lectures.

### **Impact of Changes from Last Year**

Most significant change from 2007 was the inclusion of an Anatomy block at the start of the module. The module directors thought that this was a good addition although somewhat ineffective due to circumstances beyond their control.