Report of the Educational Program Committee

B. Structure
Providing a General Professional Education
The medical degree program at the School of Medicine provides an education that is noteworthy both for its breadth and for its depth and, accordingly, prepares students for all career options in medicine. Over the course of 145 weeks, trainees acquire competence in biomedicine in the contexts of investigation, clinical care, and outcomes assessment through a curricular program designed in congruence with the articulated goals and objectives of the School of Medicine. The mechanisms for providing that general professional education include: 1) a formal required curriculum; 2) an elective curriculum; 3) a wide range of optional academic and enrichment experiences; and 4) a program of academic and career mentoring.

Required Curriculum
The curriculum of the first two years of the School of Medicine’s program is predominantly, though not exclusively, classroom-based. Through a series of integrated, carefully sequenced learning modules, students not only are first exposed to all of the relevant basic and clinical sciences, but also expand upon and continually augment their core knowledge base through small group, case-based conferences, group exercises, and student-patient interactions.

Preclinical Education
In Year One, students learn human anatomy and embryology in the integrated Morphological and Developmental Basis of Medicine module. The classical disciplines of biochemistry, genetics and molecular biology comprise the Molecular Basis of Medicine module, which proceeds and lays the groundwork for the Cellular Basis of Medicine. This coursework underpins the students’ general education and prepares them to begin the study of tissue and organ system structure and function in the Foundation for Medicine sequence. Throughout the first year, in the continuous, concurrent Skills and Science of Doctoring I module, students have their first patient encounters, learn to listen to the patient’s narrative, and begin the study of the contracts among physician, patients and society through units on health prevention, medical ethics, cultural diversity, professionalism and an introduction to systems-based practice.

These courses are followed, in Year Two, by three learning modules. In the first, Host Defense, students learn the mechanisms by which the human body defends itself from external and internal challenges and the principles by which pharmacological intervention can be employed to re-establish homeostasis. Through the extensive Mechanisms of Disease module, students integrate pathology, pathophysiology and pharmacology in an organ-system coordinated manner to gain both knowledge and mechanism-based understanding of pathogenesis and therapy of disease. Coordinated, cross-departmental team teaching – both for core lectures and in small group conferences – defines this module, which also includes the appropriate, cost-effective use of laboratory and radiological diagnostic testing. Efforts are currently underway to redesign the Morphological and Developmental Basis of Medicine module in the first year so that it, too, utilizes illustrative as well as interactive imaging to teach anatomy. The second year, like the first, is spanned by the continuous, concurrent Skills and Science of Doctoring II module. Within this module, students learn to: 1) apply their growing capacity to understand complex medical issues to integrative topics such as pain management, care of the disabled and chronically ill patient, team-based medical care and domestic violence; 2) apply principles of biostatistics and epidemiology to gain understanding of population- and evidence-based medical diagnosis and decision-making, and 3) develop their history-taking and physical diagnostic skills as they are
learning the relevant pathophysiology. The modalities used in all three units of this module include direct, one-on-one, student-patient interactions, objective structured clinical encounters with direct faculty and/or standardized patient feedback, interactive, multimedia, computer modules, oral presentations and write-ups, and case-based conferences.

Clinical Education
Our general professional education continues into the years of clinical training. A two-week clerkship orientation at the end of the second preclinical year prepares our students for transition to the core clerkships. The learning objectives for this segment of the curriculum were defined over a six-month period by the directors of each of the core clerkships, working under the sponsorship of the Senior Associate Dean for Education and Student Affairs, Associate Dean for Education, and the Curriculum Coordinator. The objectives embrace a shared set of skills relevant to each of the core disciplines, including clinical skills (oral and written case presentations, progress note writing, systematic approach to and interpretation of arterial blood gas values, electrocardiograms and basic radiographic images, hospital team and information systems orientation, patient confidentiality, informed consent, infection control and transmission of bad news); technical skills (fundoscopy, otoscopy, venipuncture, Advanced Cardiac Life Support); professionalism (expectations, practice-based learning); cost-effective use of diagnostic testing; and an extension of their training in evidence-based decision making to its application in the clinical environment.

The required clerkships include medicine, surgery, pediatrics, neurology, obstetrics and gynecology, psychiatry, critical care, ambulatory care, and an acting internship in medicine. The first six are part of the third year curriculum, which also features either one of two months of elective time depending upon whether the student takes ambulatory care as a 3rd or 4th Year clerkship. Critical care and the acting internship in medicine are 4th Year core requirements. In each of these clerkships, students are exposed to a wide range of subspecialties within the discipline, both in terms of patient mix and formal didactics. For example, students on surgery spend the plurality of their time on general surgery, but also rotate through several specialty blocks, including vascular, pediatric, cardiac, transplant, trauma, plastic and oncologic surgery. In each of these experiences, students also are introduced to the role of other specialties in the care of their patients through, for example, formal and informal instruction in radiology, pathology and social services in the context of the individual patients cared for by the members of the service team.

Elective Curriculum
In addition to the required curriculum, students in the third and fourth years are required to participate in a minimum of eighteen weeks of electives. This allows students the opportunity to both broaden and deepen their educational programs still further, taking ownership of and customizing this segment of their learning program as they begin to “differentiate.” All of the clinical departments, and all of the subspecialty areas within these departments, provide both clinical and research electives. Some of the elective offerings, such as those in musculoskeletal disease, are available as cross-departmental rotations. Basic and clinical research electives also are available in areas such as Epidemiology and Health Outcomes. While these electives typically are taken in one-month blocks, students interested in research are encouraged to group several elective months together in order to promote a coherent and productive experience. The website of the Office of Registration and Student Records (www.med.nyu.edu/registrar) has a complete listing of all structured electives available at the School. Students may elect to take their electives at School of Medicine or at any LCME-accredited medical school. In addition, students can propose individual clinical or research preceptorships in the United States and
abroad that, if accompanied by specific goals and objectives, signed by the preceptor and approved by the Senior Associate Dean for Education and Student Affairs, may receive elective credit toward the medical degree.

Advanced Science Selectives
In addition to the above electives, students transitioning from the third to the fourth year are required to participate in a two-week Advanced Science Selective. Students, who have now completed a full-year of clinical training and are working toward defining the next phase of their educational program, integrate their preclinical and clinical thought patterns by engaging in an in-depth, literature-based, small group seminar on a topic drawn from the frontiers of translational medicine and/or biomedical technology. While the primary goal of the selective is to encourage scholarship, consolidation and integration of preclinical and clinical knowledge, the ability of students to select from among a variety of seminar choices permits them to pursue individualized interests and gain deeper appreciation for the interface between new biomedical discovery and clinical medicine. Course offerings vary with the state of the art; recent topics have included Stem Cell Therapy, Models of Multigenic Disease, Vaccine Development, Neurobiology of Pain, Ion Channels and Disease, DNA Technology in Medicine, Anatomy for Surgeons, the Microbiology of Bioterrorism, Drug Development, and two offerings, Rational Utilization of Clinical Laboratories and Survival Skills for Residency, that stress amplification of evidence-based decision making skills.

Extracurricular and Other Enrichment Opportunities
Students with special interests are served by clubs and special interest groups which permit the students to have a greater interaction with the faculty in areas of their own choosing. Moreover, students with a particular interest not served by the current clubs and interest groups are encouraged, under the guidance of the Associate Dean for Student Affairs, to identify mentors and propose new interest groups that may serve their needs. The result is a large, robust, and programmatically active collection of clinical clubs/interest groups, including but not limited to the Cardiology Club, Nutrition Club, Caring for Kids, Dermatology Interest Group, Emergency Medicine Club, Endocrinology Interest Group, Ether (Anesthesiology Club), Ophthalmology Club, Family Medicine Interest Group, GI Club, Hepatitis Project; Homeless Health Advocates, New York City Free Clinic, Obstetrics/Gynecology Interest Group, Plastic Surgery Club, Student Interest Group in Medical Imaging Applications, Psychiatry Interest Group Sports Practitioners’ Interest Group, Student Collective for Ear Nose and Throat, Surgery Club, Wilderness Medical Club, Child Abuse Prevention Project, Global Medicine Club, Law and Medicine Club, Sexual Health Advocacy Group, Physicians for Human Rights, and Physicians for a National Health Care Program. Students interested in issues of medical journalism and/or communications may participate in the student newspaper and the student arts magazine, and those students interested in biomedical investigation also produce an annual journal of medical student research.

Master Scholars Program
The Master Scholars Program enriches the environment for learning and students’ concepts of their identities as physicians-in-training in a variety of ways. Each student chooses membership in one of five Master Societies: the Jonas Salk Society for Biomedical and Health Sciences, the Severo Ochoa Society for Medical Informatics and Biotechnology, the Walter Reed Society for Health Policy and Public Health, the May Chinn Society for Bioethics and Human Rights, and the Lewis Thomas Society for Arts and Humanities in Medicine. Each Society, named for a renowned alumnus or faculty member of the School. The Societies sponsor lectures and seminars in areas that are important to all physicians as individuals, professionals, and members of society. Through these offerings, the students’ perceptions of the breadth of opportunities open to them
are expanded, opportunities for in-depth participation in these areas are communicated, and the groundwork for student-faculty mentorships is laid.

**MD/PhD Training Program, MD/MPH Program in Global Health and Honors Program**

Students who have a particular interest in careers in academic medicine have additional enrichment options available to them. Qualified students may apply for our NIH-funded MD/PhD training program, or our new MD/MPH Program in Global Health. Students interested in research, but seeking a less intensive exposure during medical school, also can apply to participate in the Honors Program. In this program, students work on a well-defined project under the guidance of an approved mentor in their area of interest. After a minimum of 18 weeks of research, which may include time spent during the summers prior to and following the first year, participating students write and defend an abbreviated thesis and, if successful, receive their medical degrees with “Honors” upon graduation. Finally, interested students also are encouraged to consider spending an additional year during medical school pursuing specialized training within or outside of the medical school, including obtaining MPH degrees and securing research fellowships under NIH, Howard Hughes, Alpha Omega Alpha, Sarnoff or Doris Duke Foundation sponsorships. Over the past few years, an average of twenty students per year have elected to spend a fifth year in training prior to graduation. Collectively, these activities provide students with a rich set of opportunities for pursuing their interests in the science and public policy of medicine.

**Mentoring and Counseling**

Mentoring of students takes place through the combined efforts of the Senior Associate Dean for Education and Student Affairs, the Associate Dean for Student Affairs, and the Master Scholars Program. Each student is assigned a faculty member affiliated with the student’s Master Scholars Society. Mentors provide students with a network of resources in order to facilitate intellectual, professional, and personal development. In the context of the current discussion, the role of the mentor is to provide students with insight into their potential career interests, refer the student to other faculty who represent potential resources, and counsel students on experiences which they can pursue within the school that will assist them in career preparation/decision-making. The Associate Dean for Student Affairs is available at all times to provide counseling on available educational resources and to assist with personal professional career questions and self-assessment. The Senior Associate Dean for Education and Student Affairs, who writes the dean’s letter for each of the students, also works with the class officers to schedule career panels for the students with the various residency program directors and departmental chairs. Formal preparation for residency application begins in December of the third year, during which the Senior Associate Dean for Education and Student Affairs explains the timeline and application process. By early March, each student has submitted a list of potential areas of interest for further training and, by early May, has an individual faculty advisor in each department of interest. Throughout May and June, the Senior Associate Dean for Education and Student Affairs meets in small group sessions with the rising 4th Year class and, throughout the summer, meets one-on-one with each student to solidify his or her career choice and review individual application strategy.

In the past, the different components of the personal and professional development program for medical students have been “housed” differentially in the Office of Medical Education and Student Affairs and guided by two deans (the Senior Associate Dean for Education and the former Senior Associate Dean for Student Affairs). As a result, the continuity between progressive stages of development, mentoring and advising as students progress from one stage to the next of their own developmental process and from more general to specialized advising and
mentoring was ambiguous. At the beginning of the 2006-2007 academic year, this section of the Dean’s Office was restructured. Dr. Lynn Buckvar-Keltz assumed the position of Associate Dean for Student Affairs; among her responsibilities is individual counseling of students having personal or academic difficulty. The portfolio of the Senior Associate Dean for Education was extended to include overall responsibility for Student Affairs, bringing all components of student education and student life under one umbrella. With this new structure in place, the Senior Associate Dean for Education and Student Affairs is convening two task forces, one to analyze the strengths and weaknesses of the current system and develop a proposal for a comprehensive, seamless mentoring/advising program, and the other to design a mechanism through which the goals and objectives of the Professional Development Portfolio may be linked with those of an effective Office of Academic Integrity.

**Outcomes Measures for Career Selection**

We utilize three primary outcomes measures to assess success in preparing students for all career options in medicine. These include:

1) Performance on Parts I and II (CK and CS) of the USMLE. These outcome measures provide us with an indication of the extent to which we have been successful in broadly educating our students for a range of careers. Our students typically do quite well on both parts of the boards, with a pass rate higher than 95%. Moreover, the data on our students’ subject-specific performance suggest that they do uniformly well across the topic areas, scoring at or above the national average on all aspects of the licensing exam.

2) Annual results of the National Residency Match Program. These results provide us with information about the distribution of careers (or, at least, initial clinical training trajectories) that our students elect to pursue. Recent data indicate that, over the past five years, our students have successfully matched into programs for every professional training pathway in medicine, including Anesthesiology, Dermatology, Emergency Medicine, Family Medicine, General Surgery, Categorical and Primary Care Medicine, Neurology, Neurology/Psychiatry, Neurosurgery, Obstetrics and Gynecology, Ophthalmology, Orthopedic Surgery, Otolaryngology, Pathology, Pediatric Neurology, Pediatrics, Pediatrics/Medicine, Plastic Surgery, Psychiatry, Radiation Oncology, Radiology, and Rehabilitation Medicine. Additionally, the quality of the programs to which our students match provide us with an indirect indication of the superior quality of our training, as perceived by residency training programs.

3) Annual results of residency program directors’ assessments of our graduated students. In April of the year following the graduation of each cohort of students, we elicit explicit, individualized feedback from the directors of the programs to which our students have matched. In comparison to their fellow first year residents, our students are rated highly and consistently above average on specific criteria that capture their knowledge, skills and professional attitudes.

In summary, the School of Medicine ensures a rich, general medical education by combining a broad required core curriculum, electives that permit each student to both expand in breadth and differentiate toward his/her interest, and a collection of complementary activities that provide additional scholarly opportunities. Faculty counseling and mentoring assist students in making wise decisions for their further training and future careers, for which data confirm that they are exceptionally well-prepared.
Recommendation

- Continue to develop a comprehensive and seamless advising and mentoring program that vertically spans all four years of a student’s undergraduate professional training.

Educational Activities That Promote Self-Directed and Lifelong Learning

Students are prepared to take active responsibility for their own learning from the very first weeks of their educational training program. This key aspect of the educational program begins with student preparation for small group case studies in the first month of the first year and culminates during the fourth year acting internship. As the students move through the curriculum, these activities become progressively less faculty-directed and more self-directed. At all points, the changing nature of scientific and medical knowledge and skills is stressed. Accordingly, a key element in all aspects of our curriculum is “learning how to learn.”

Activities

Four main types of activities contribute to this aspect of the curriculum: (1) preparation for class activities based on material provided by the faculty (first year); (2) preparation for class activities based on material sought outside the formal curriculum, including traditional and electronic library resources (first and second years); (3) preparation for presentation of an evidence-based clinical plan based on information sought largely outside the formal curriculum (clerkships); and (4) preparation for patient care without restriction with respect to source (acting internship, consultative electives). While types 1 and 2 are largely faculty-driven, types 3 and 4 are largely self-directed. All activities, regardless of their vertical placement in the curriculum, are patient- or case-centered. Selected, but no means exhaustive, examples drawn from our curriculum are given below.

Sufficiency

Both the students and the faculty view this aspect of the curriculum favorably. By the middle of the third year students are expected and able to: 1) find answers to any question they may have with respect to the care of their patients; and 2) begin to make diagnostic and therapeutic assessments and plans based upon a critical reading of the relevant literature. Although the clerkships offer formal material presented in lectures, journal clubs, and case discussions, students are fully versed and confident in using electronic resources; they are expected to demonstrate their proficiency in write-ups, case and journal club presentations, and preparations for clinical Pathological conferences (CPC), clinical vignettes and cyber classroom sessions. Acquisition of these skills is a specific component of summative student assessment in all of the core clerkships, and formative assessment of the development of these skills is an objective of the small group, case-based conferences in the preclinical curriculum. By the acting internship and in other fourth year curricular activities, self-directed learning has become an everyday habit. In the assessments of our graduates’ performance by their first year residency program directors, our graduates have consistently scored at or above the cohort in terms of their data analysis and interpretation, knowledge of the literature, use of literature during rounds, use of literature for clinical decision-making, and critical judgment.
Resident Evaluation by Program Directors
ALL Specialties
Evidence Based Medicine and Critical Reasoning Skills

Class 2004

Data Interpretation & Analysis
Knowledge of the Literature
Use of Literature on the rounds
Use of literature for clinical decision making
Critical Judgement

Class 2005

Data Interpretation & Analysis
Knowledge of the Literature
Use of Literature on the rounds
Use of literature for clinical decision making
Critical Judgement

1=inadequate 7=outstanding
Year One Examples

Module: Host Defense: Mechanisms and Therapeutics
In the introduction to the module, students learn that major emphasis will be on important general principles, rather than on minute details about individual microorganisms. The faculty stress that the lectures and small group exercises cover in detail only some of the important viruses, bacteria and fungi, focusing on those infectious agents and infections which best illustrate the basic concepts necessary for understanding the principles of infectious pathogenesis and host response. The material selected for presentation is carefully chosen to provide the students with a framework for self-directed study of infectious agents which are not covered in detail in this course.

For example, because the number of medically important helminths and other parasites is large, formal didactic sessions are used as a mechanism for presenting representative organisms which illustrate general life cycle and host interaction patterns. We promote self-directed learning by including some pathogens in case-based small group discussion sessions which were not formally covered in core lectures; we provide guidance for self-study by accompanying each case study with suggested textbook assignments, Internet resources, and a School website with high-resolution, digitized microscope slides showing the worm and the pathology it can cause. Our objectives in this approach are to: 1) model how application of general principles can expand knowledge; 2) demonstrate the critical role of self-directed learning in converting knowledge into understanding; 3) stimulate students’ senses of inquiry by directly relating science and clinical medicine in a vivid, interactive manner; and 4) reinforce the self-fueled, continual learning their professional careers will demand.

Module: Molecular Basis of Medicine
The subject matter of this module is drawn from areas of biomedical knowledge that are changing exceptionally rapidly. Therefore, the curricular approach, of necessity, is designed to promote self-directed, lifelong learning. Specific activities which highlight this approach include our small group discussions and the independent genetic disease paper done by students at the end of the block. At the beginning of the module, students are introduced to the major molecular biology and genetics on-line data bases. Throughout the course, students are required to use these databases to obtain information that will be discussed in the small group sessions.

Year Two Examples

Module: Skills and Science of Doctoring II
The students learn many of the skills required for self-directed, lifelong learning in the Epidemiology, Biostatistics, and Preventive Medicine unit of the second year segment of the longitudinal Skills and Science of Doctoring module. The principal learning objective of this unit is acquisition of an understanding of the principles of critical appraisal of the medical literature and of clinical decision making. After providing a review of the fundamental concepts of biostatistics and epidemiology needed to interpret published medical studies, the faculty preceptors require that students use those concepts to read, critically evaluate, interpret, and use information from articles and abstracts in the medical literature. These expectations are specifically communicated in the content and format of the various worksheets, conferences and written assessments of the unit. For example, in the Preventive Medicine segment of the unit, after learning the framework for and basic tools of clinical epidemiology such as Bayes’s theorem and operating characteristics of diagnostic and screening tests, students work through a few,
specific, in-depth examples from preventive medicine, including vaccination against Haemophilus influenza, screening for breast cancer, and occupational asthma. The overall objectives of each of these exercises -- to provide physicians-in-training with the necessary, cross-disciplinary tools to ask the right clinical questions, find the information they need in the medical literature, evaluate the validity and reliability of the information and its applicability to patients in their care, and use the information correctly to support clinical decision making -- are made clear to the students by the unit directors.

Physical Diagnosis, a second unit of the Skills and Science of Doctoring II module, also fosters self-directed learning, albeit in a very different venue. Students, in groups of two, work with a preceptor to initially develop and subsequently improve their clinical skills. Each student identifies skills in need of more attention, works with his or her preceptor to practice bedside skills, and comes to elucidate continual learning as the tool by which clinical communication, history-taking and physical examination skills grow over a professional lifetime.

**Clerkships**

During orientation to the third year, students collaborate with preceptors and library staff to review effective means of searching the clinical literature. Subsequently, the skills which they have consolidated are honed during each clerkship. In every clerkship, students present formally, both in oral and written format, their patients to the attending physicians. They are required to demonstrate the ability to use all available resources to develop an evidence-based, clinical plan for each of their patients. Furthermore, although students have no direct responsibility for patients, they must demonstrate understanding of the scientific basis for their patients’ disease processes and incorporate that understanding into formulation of differential diagnoses and diagnostic and treatment plans. Thus, they must be able to efficiently and effectively search the scientific and medical literature. Critical thinking, rational, data-based clinical decision making, the skills needed for self-evaluation (e.g., identifying what you don’t know), and continual reformulation of hypothesis and approach as new data become available are emphasized and specifically assessed in each clerkship.

**Consistency of Educational Quality and of Student Evaluation**

During the first two years of the educational program at the School of Medicine, the bulk of the educational experience occurs at a single site. This centralization allows for consistent educational experiences when the entire class is engaged in a single session or when smaller groups of students are precepted by the same instructor. In all of the small group learning exercises – from the smallest one or two-on-one sessions in the Skills and Science of Doctoring longitudinal module to the largest (i.e., 30-35 students) case-based seminars in some units of the second-year Mechanisms of Disease module – faculty development and preparation to ensure educational equivalency takes place at a minimum prior to the first meeting of the small groups. In modules which engage fourth year medical, MD/PhD and graduate students, residents or fellows as small group preceptors, students meet with the unit and module directors at least once before the group sessions begin, but often during and after the particular organ system block in which the students serve as teaching assistants. In the pre-meetings with their instructors, the unit and module directors define the objectives of each learning exercise and articulate the key concepts with which each student should leave the session. Since 1) the summative assessments for all students in all modules of the first and second years are uniform; 2) students directly evaluate both their large and small group preceptors as part of a comprehensive dean’s office curriculum assessment tool; and 3) the unit and module directors can track specific students to specific small group preceptors, there are robust mechanisms in place to evaluate consistency of
educational quality and of student performance evaluation, identify deficiencies should they exist, and, with the assistance of OME, remediate such deficiencies.

Because the majority of students spend at least some time during their third and fourth year core clerkships at the clinical sites listed and described in the required course and clerkship forms and elsewhere in the database, ensuring consistency in educational quality and student assessment across sites is both critical and more difficult. The various clerkships employ some common mechanisms to promote cross-site educational consistency. These include:

- Communication of specific educational objectives and assessment criteria among clerkship directors, site directors, faculty and residents
- Development and implementation of a common core curriculum to meet those established objectives
- Assessment of and feedback from students.

**Bidirectional Communication**

Regular meetings of the clerkship and site directors promote bidirectional communication between the different constituencies involved in the educational program for our students. First, in direct clerkship and site director meetings, the objectives of each clerkship are reviewed, linkages to assessment methods defined, and criteria for assessment discussed. The frequency of these meetings varies across clerkships, but at the very least occur annually. Electronic communication facilitates coordination across sites and, last year, the Senior Associate Dean of Education and Student Affairs began what will become an annual visit to our main alternative site, the North Shore/Long Island Jewish Hospital System. Second, clerkship and site directors communicate directly with their teaching faculty. All of the core clerkships distribute, via the site directors, their learning objectives to the faculty and, by the end of this academic year, the three clerkships which do not yet have active, current websites will be “online” for both students and faculty. Some of the clerkships provide regularly scheduled, departmentally requested, faculty development sessions in conjunction with OME; during these sessions, faculty learn and practice small group and large lecture, as well as feedback, skills. This year, in association with the Office of Organizational Development and Learning (ODL) and in collaboration with the Office of Graduate Medical Education (GME), OME is sponsoring a series of structured training sessions open to the general faculty. Finally, given the intimate interactions among house staff and students, it is important that the residents serving as teachers be familiar with the clerkship objectives, core curriculum and assessment criteria. As stated above, the clerkship objectives are available to house staff both as hard copy and in electronic format. Furthermore, several departments have adopted an annual “Residents as Teachers” workshop program or work directly with the Associate Dean for Education to enhance the teaching skills of the residents.

**Core Curriculum**

All of the core clerkships, with the exception of Advanced Medicine, have a clearly articulated and well-posted core curriculum. Some clerkships have centralized group sessions to which students on rotation at all sites come for didactics; others fulfill the objectives of the core curriculum through shared "paper case" vignettes, online, interactive, multimedia modules, or cyber classroom discussions. The number and quality of these sessions, as well as of teaching and/or preceptors rounds, are reviewed for each site by the clerkship director and evaluated by the students themselves through the dean’s office clerkship evaluations. Data are deconstructed by site so that inconsistencies in quantity and/or quality of formal learning sessions can be identified and remedied.
Assessment and Feedback

Prior to the current academic year, clerkship directors monitored each student’s clinical experience by a number of different methods. In Medicine, Ambulatory Care, Pediatrics, and Surgery, PDA-based, web-based or paper-based patient logs recorded individual student’s experiences longitudinally. In Neurology, Psychiatry and Obstetrics and Gynecology, this information was obtained through one-on-one meetings with the clerkship directors and/or student preceptors. Last year, while linking their own specific clerkship objectives to the institution’s educational program objectives, every clerkship director also articulated the number of actual or simulated patient encounters, as well as the level of involvement in each encounter, required to ensure achievement of the clerkship’s learning objectives. At Clerkship Orientation in June 2006, each student received a booklet with the patient encounter logs for each of the nine core clerkships. This information will provide the clerkship directors, the OME and the Curriculum Committee with valuable information on cross-site equivalency. Under the guidance of the Senior Associate Dean for Education and Student Affairs, the information derived from this inventory also will inform the educational research and development agenda of the AES group and the Associate Dean for Medical Education and Technology. The six core clinical disciplines – Medicine, Surgery, Pediatrics, Psychiatry, Neurology and Obstetrics/Gynecology – all employ subject examinations provided by the NBME as one measure not only of acquisition of knowledge, skills and attitudes, but also of consistency of educational quality and student assessment across sites. In addition, the standardized, online clerkship student assessment tool, developed by all clerkship directors three years ago, features qualitatively robust descriptors by which a student’s knowledge, skills and professionalism may be assessed with a minimum of evaluator bias. Seven of the nine clerkships utilize this standardized clerkship assessment methodology consistently across sites and across clerkship blocks. This has resulted not only in markedly improved transparency of the assessment process, but also finer “granularity” in distinction of one student’s performance from another’s. These mechanisms, in combination with the feedback obtained directly from students through the dean’s office clerkship evaluation system, have improved our ability to ensure robust assessment of the consistency of educational quality and of the student assessment process.

Recommendations

- Continue to promote cross-site equivalency in educational experience and quality by analysis of the information obtained through the students’ patient logs; utilize this data not only to prompt educational program “course corrections” when necessary, but to directly inform the research and development efforts of AES in creating innovative curricular elements.
- Continue to develop, in full collaboration with the Dean, Curriculum Committee and Department Chairs, an effective method for addressing the rare instances in which clinical grading policy at the departmental level is not congruent with that adopted by the School of Medicine.

Required Content Areas

It is of course easier to determine whether a content area is addressed than how well it is addressed. This is particularly true for those areas which are covered in multiple courses and clinical exercises throughout the four years of medical school. For example, areas such as “communication skills” or “multicultural medicine,” although explicitly addressed early on in the longitudinal Skills and Science of Doctoring module of our curriculum, could plausibly be considered essential components of every required clerkship, even if they are not identified as specific course objectives. In this section we will discuss our methods for determining how well the various content areas are being addressed and, based upon that analysis, present our
assessment of particular curricular strengths and areas that remain challenging and require additional attention.

**Methods of Assessment**

The charge actually comprises several subsidiary questions. Is a required content area included in the curriculum? How much time is devoted to it? Are students acquiring the knowledge and skills appropriate to the content? Do students perceive the teaching to be adequate? We have available a number of instruments for answering these questions. None is appropriate to all areas, and some are more useful in one context than in another. Individual course evaluations provide detailed, up-to-date data on specific courses and are useful when a content area roughly corresponds to a single unit within a module such as biostatistics, epidemiology and genetics. Performance on standardized examinations (USMLE Step I and II including the clinical skills examination, as well as clerkship subject examinations) can provide evidence of knowledge and skills acquisition.

The AAMC Graduation Questionnaire (GQ), completed by new graduates each year, has the advantage of evaluating not only specific courses, but also content across courses and years of training. It provides subjective, “impressionistic” ratings on the quality of instruction and whether the amount of time devoted to particular topics was or was not adequate. One disadvantage of using the GQ is that the number of questions pertaining to any one topic varies widely. For example, in the 2005 questionnaire there were 14 questions about geriatrics and one question on human sexuality. A further disadvantage is that the questionnaire necessarily relies on retrospective impressions of curricular work sometimes done four years earlier. Memories over time become distorted, and the curriculum itself may become substantially revised over the respondents’ four-year window. Nevertheless, the GQ is a helpful source of information for areas in which additional data are lacking.

**Assessment Observations**

Information from all sources available strongly support the adequacy of the School of Medicine’s training in nearly all content areas. One example of the robustness of training is in “communication skills,” a topic addressed in the Physician, Patient, and Society unit of the Skills and Science of Doctoring module, the psychopathology section of the Brain and Behavior module, and in every required clinical clerkship. The GQ asks students how strongly they agree or disagree with the statement, “I am confident that I have the appropriate knowledge and skills to...[communicate with patients in a variety of circumstances.]” The proportion of students rating “strongly agree” or “agree” ranged from 77.6% (for discussing a prescription error with a patient) to 92.3% (for providing safe sex counseling to a patient with a different sexual orientation).

Further evidence that communication skills are well addressed in the NYU curriculum comes from the clinical skills examination (CSE) of the USMLE Step II, a portion of which directly assesses physician-patient communication. In the 2004-2005 academic year, of the 165 NYU medical students who took the CSE, 96% passed. The adequacy of training and evaluation is further supported by the results of the in-house Comprehensive Clinical Skills Examination (CCSE) required of all medical students progressing from the third to the fourth year. The CCSE is modeled on the USMLE Step II clinical exam and uses standardized patients in a number of clinical encounters. Of the 160 students taking the exam in its 2004 pilot year, seven were judged to have substandard communication skills. The number in 2005 was six. Beginning in 2005, specific remediation was offered to all students who did not meet or exceed expectations in this clinical skill set.
Evidence for other key content areas is less extensive, but nevertheless positive and reassuring in most cases. In the absence of other information, GQ ratings on the amount of time devoted to particular topics provide a rough approximation of how well the area is addressed. (The response rate to the School’s GQ is high, well above the national average.) Ratings of “inadequate” amounts of time, as opposed to “appropriate” or “excessive” suggest a need for review. The reverse, however, is not necessarily true: students may rate the time devoted to a “boring” topic by an inadequately brief but unengaged lecturer as “appropriate.” Of the 33 key content areas in the 2005 GQ, 21 were rated as being “appropriately” represented in the curriculum by most students.

The time devoted to six of the areas was rated “inadequate” by a majority of our students on the 2005 GQ. These areas are: (1) alternative medicine; (2) health care systems; (3) medical jurisprudence; (4) nutrition; (5) pain management; and (6) practice management. It should be noted that in every case the proportion of students rating the item as inadequate has declined over the last five years. For example, in 2001, 74% of respondents said the time allotted to teaching about alternative medicine was inadequate. In 2005 the number had decreased to only 53.5%. Similarly, two years ago, an interdisciplinary segment on pain management was introduced into the Nervous System unit of the second-year Mechanisms of Disease module. The initial effects of introduction of that curricular element on the perceived adequacy and quality of pain management content will not be seen until members of the current fourth year class complete the GQ. Last year, the School of Medicine received a donor gift and endowment to develop curriculum in healthcare systems and practice management. Under the guidance of the Senior Associate Dean for Education and Student Affairs, a task force is developing a vertical educational program in the “business of medicine” that will span both undergraduate and graduate medical education. Several of these six areas embrace topics, including nutrition and alternative medicine, also not well addressed in the graduate medical education curriculum. Accordingly, they represent priority items for the School of Medicine to pursue through the Office of Medical Education and its AES R&D group.

Six key content areas are not captured by questions on the GQ. These are: (1) health care quality review; (2) home health care; (3) human development/life cycle; (4) medical humanities; (5) patient health education; and (6) rehabilitation/care of the disabled. Of these six, health care quality review and patient health education are extensively covered and evaluated in the Skills and Science of Doctoring module and in the Ambulatory Medicine clerkship. The medical humanities are addressed both broadly with the Skills and Science of Doctoring module and highly specifically in the “Patient Narrative” segment of that module, as well as in the Humanistic Medicine seminars which are a component of the Medicine core clerkship. In addition, throughout their preclinical years and core clerkships, students write reflective pieces that are required coursework and also become part of their Professional Development Portfolios. This past year, the NYU School of Medicine and United Cerebral Palsy of New York initiated a flagship program in which disabled patients participated in the “Patient Narrative” small group sessions with a faculty member and four students. This program earned recognition by the Office of the Mayor of the City of New York. Although home health care is not addressed directly within the curriculum, second year students do have a small group exercise on team care of the chronically ill patient. Although human development/life cycle is addressed in the behavioral science segment of the Nervous System unit of the Foundation for Medicine module, the emphasis is weighted more toward child development than it is toward aging and life cycle changes.
In summary, most key content areas are well represented across the four years of medical curriculum. Communication skills is one example (from among many) of particular strength. Six topics are inadequately represented, but have been improving: (1) complementary and alternative medicine, (2) health care systems, (3) nutrition, (4) medical jurisprudence, (5) pain management, and (6) practice management. Two topics may be underrepresented in the curriculum and require greater attention: home health care and human development/life cycle.

Recommendation

- With a robust, collaborative system for horizontal and vertical curricular conversation and integrated, interdisciplinary curriculum delivery systems now in place, continue what the joint committee of preclinical unit and module directors and clerkship directors already have begun: a thorough reassessment of the core content of the curriculum. The goals of this process are to: 1) evaluate and, if necessary, redistribute weight placed upon certain topics while introducing key new areas which reflect the changes in biomedical discovery, translational medicine, and clinical care; and 2) develop and implement innovative methods of cross-disciplinary and vertical curricular delivery.

Inpatient and Ambulatory Teaching

Balance between Inpatient and Ambulatory Teaching

The increasing emphasis on the outpatient setting in current medical practice necessitates that all students are properly exposed to, and trained in, ambulatory health care delivery. At the School of Medicine, we call upon an extensive clinic system at several of our hospitals to provide our students with an appropriate level of ambulatory teaching in each of the required disciplines. All core clerkship disciplines (excluding Critical Care and the Advanced Medicine acting internship) either include ambulatory care experiences in their structure, or are complemented by a separate, dedicated, ambulatory care rotation. The goals and objectives for each clerkship are designed to emphasize the continuity between inpatient and outpatient medicine. Thus, a balance between inpatient and ambulatory experiences is assured. Appropriately, the most extensive ambulatory care experiences are provided in Medicine and Pediatrics, where each provides full-time, four-week daily ambulatory experience. In Medicine, the Ambulatory Care experience constitutes an independent clerkship, which not only includes primary care and subspecialty ambulatory experiences, but also emphasizes the general skills of ambulatory care medicine. Of note, the vast majority of preceptorships within the Skills and Science of Doctoring longitudinal module over the first two years occur in ambulatory settings. A brief description of the required ambulatory experiences within the core clerkships, and how they relate to the inpatient experiences, follows.

Medicine/Ambulatory Care

All students participate in a 4-week, full-time, outpatient medicine rotation; the inpatient component of the core Medicine experience includes an 8-week rotation in the third year and a 4-week acting internship in the fourth year. Students attend medicine primary care clinics daily and are assigned to a 1:1 experience with their faculty preceptor. In addition, students rotate each week through a variety of medical subspecialty clinics. Student encounters are recorded in a PDA log and are reviewed by the clerkship director to ensure an adequate experience. Preceptors perform direct observation of students to provide feedback and evaluation; student performance also receives formative and summative feedback through Objective Structured Clinical Exams (OSCEs).

Pediatrics
The ambulatory pediatrics experience consists of four weeks (out of a total of eight) dedicated exclusively to outpatient pediatrics. Over this 4-week period, approximately 15% of the time is spent in the pediatric emergency room. Students work directly with attending physicians and fellows, as well as with residents; faculty are responsible for assigning students to patients according to the students’ knowledge/ability as well as the complexity of the patients. Students are evaluated in the pediatric ambulatory care setting for intellectual curiosity, fund of pediatric-specific knowledge, history and physical examination skills, communication skills, and professional attitudes, and they also undertake a 4-station OSCE. Student performance, as well as student evaluation of the rotation, are used to assess the success of the rotation at each institution.

**Obstetrics/Gynecology**

Students on the Ob/Gyn clerkship are required to spend 1 week of the 6 week rotation (i.e., 17%) on a full-time, core ambulatory care experience, divided between obstetrics and gynecology. Students attend clinic daily during that time, and are taught, supervised and evaluated by both attending and resident physicians. Interested students have the option of spending an additional elective week of their Ob/Gyn rotation in the ambulatory setting, thus raising their total ambulatory training to approximately 1/3 of the rotation.

**Neurology**

Training in neurologic ambulatory care is integrated into the overall neurology clerkship, which is 4 weeks in duration. Students devote 10-13% of their overall neurology rotation to ambulatory care, as a single 4-5 hour clinic session weekly (16-20 hours total). Students from almost all of the neurology inpatient training sites attend the Bellevue neurology clinic. The only exception to this rule is students doing inpatient neurology at the VA New York Harbor Healthcare System (VA), who participate in the neurology clinic at that institution. Students in the neurology ambulatory care setting work closely with residents, but are responsible for performing components of the neurologic examinations and are supervised by an attending physician.

**Psychiatry**

The psychiatry educational program director strongly believes that for an initial introduction to psychiatric diagnosis and care, students benefit most from exposure to patients with well-defined and relatively unambiguous diagnoses, such as those seen on the inpatient psychiatry service. Moreover, although much of psychiatry as it is currently practiced is an outpatient discipline, issues of patient confidentiality and comfort make it difficult to provide students with a separate, core psychiatry outpatient experience. In order to emphasize inpatient care but still provide a balanced exposure, the psychiatry clerkship offers ambulatory exposure that is, like neurology, integrated as a weekly experience within the clerkship. Students attend one outpatient clinic (4-5 hours) per week, including intake evaluation or medication management. Students also attend and participate in the new VA Post-Traumatic Stress Disorder clinic; this experience is considered particularly valuable because it provides longitudinal exposure to generally expressive patients. In addition, over the course of the 6-week rotation, students devote four 8-hour shifts to the psychiatry emergency department. Thus, the total time spent in the outpatient setting is approximately 20% of that of the total clerkship. Residents, fellows and faculty all participate in the teaching process, and students are directly observed at least three times during the rotation.

**Surgery**

As it is for psychiatry and neurology, the ambulatory care experience for surgery is integrated into the surgery clerkship. Students spend at least 1-2 afternoons (8 hours/week, or 20% of the total clerkship) participating in surgery clinics, where they are supervised by both faculty and senior (R4 and R5) residents, and also interact with fellows and junior residents. Performance is
evaluated by direct observation as well as an OSCE. Of note, the inpatient surgery clerkship experience includes two 2-week blocks on selected specialty services (e.g., vascular, pediatrics, cardiac, plastics, transplant, neurosurgery). While on these blocks, students participate in the ambulatory care clinics for these areas, providing a diversity of ambulatory surgical experience.

To confirm that the required ambulatory care experiences are satisfactory, students are surveyed at the end of each ambulatory care block (or at the end of the inpatient clerkships into which their ambulatory care experiences are integrated), and are queried about the experience. The responses are reviewed by the clerkship and/or ambulatory care directors, and adjustments considered and made as appropriate.

In addition to these required ambulatory experiences, students have the opportunity to choose additional ambulatory care experiences as elective rotations in their fourth year, or to participate in inpatient electives which also include ambulatory care exposure.

**Appropriateness of the Teaching Sites**

As a fundamental ingredient in appropriateness, the school relies first and foremost on the fact that each of the hospitals utilized as a training site is a large, active, and highly regarded institution. As detailed in the database and elsewhere in the LCME self-study, each institution is characterized by a large number of admissions in a variety of specialties and subspecialties, a highly regarded faculty, and extensive support and educational opportunities for the students. While each of the institutions has a distinct character (i.e., public, mainly private, mixed), four of the training sites (i.e., Bellevue Hospital, Tisch Hospital, North Shore-LIJ and Lenox Hill Hospital) are large, multispecialty hospitals and/or hospital systems. The VA is also a general care hospital, although as a veterans’ facility the majority of patients are male.

The total beds potentially available to our students for training across the sites numbers more than 3,000. While most clerkships utilize all the training sites, these are carefully evaluated as to both need and appropriateness, and some sites are not used by some clerkships. To cite an obvious example, Ob/Gyn does not utilize the VA Hospital. Less obvious examples that illustrate application of the appropriateness principle to clinical training sites include: 1) the elimination of the VA as an inpatient surgical site because of relatively low volume of inpatients at the VA while outpatient population has grown; and 2) utilization of the inpatient services of the Long Island Jewish Hospital campus of the North Shore-LIJ System, taking advantage of LIJ’s dedicated Schneider Childrens’ Hospital. To further ensure balance between institutions, most clerkship experiences involve inpatient experience at more than one hospital, always including a general care site. Moreover, on all clerkships, students spend at least part of their rotations assigned to one or more of our core hospitals (Bellevue, Tisch, and for some clerkships, the VA). Finally, students are assigned to individual clerkships by lottery, in order to avoid bias in the distribution of rotations. The size and diversity of the New York metropolitan area also helps ensure that our students are exposed to patients with a very wide range of diagnoses, as well as national, ethnic and socio-economic groups.

To ensure that the inpatient clerkship experiences across institutions provide a common core of experience, the training across the institutions is carefully coordinated. Each clerkship is organized by an overall clerkship director, who meets regularly and interacts closely with the clerkship site director at each institution. For each clerkship, students across sites are provided with common goals and directives and provided with a common core curriculum. As discussed above, depending on the clerkship and the site, the curriculum is either delivered on-site, or the students return to the main campus to participate in common, didactic learning experiences. On the surgical clerkship, exposure to core material is assured and/or supplemented by the use of
computer-based simulation cases, a novel innovation that is now being examined by other surgical programs nationwide. The expansion of such modalities to other core disciplines, both horizontally across the undergraduate clinical years and vertically to embrace graduate medical education, is currently a major initiative of the Education program, led by the Vice Dean for Education, Faculty and Academic Affairs and the Senior Associate Dean for Education and Student Affairs.

Adequate and balanced training at each institution utilized in each clerkship is assured by various monitoring techniques. First, as of this year, all students are provided with clerkship logs that expressly state the objectives of the clerkship and the clinical encounters through which those objectives will be met and assessed. When a student’s log is noted to be lacking in a required experience, the clerkship site director will act to ensure provision of that experience. Data obtained from the logs also will be used to inform “gaps” in meeting particular clinical educational objectives and generate action plans for specifically addressing and correcting, by alternative modality, those areas which may require more innovative approaches. The maintenance of clerkship quality and broad consistency across experiences for individual students is further achieved by employing, for each clerkship, a common evaluation system across the institutions. Although the evaluation processes vary somewhat between clerkships, cross-institution evaluation of students invariably includes assessment by the ward attending, the supervising resident, the Firm Chief or teaching attending and the results of the shelf exam (for clerkship except Ambulatory Medicine, Critical Care and Advanced Medicine. The performance results of students are analyzed regularly, and differences between institutions are identified and tracked. An unexpected variance between institutions triggers an investigation on the part of the clerkship director as to whether such discrepancies represent actual student performance, differences in grading policy and/or style, or differences between the institutional experience and/or curriculum that require correction. Finally, student satisfaction surveys are collected regularly and analyzed across our various institutions, with a particular eye toward differences in student satisfaction among institutions. Small differences may warrant minor corrections. Larger differences - particularly low overall student satisfaction scores (<4.0 on our 7-scale) at a particular institution - will trigger more aggressive intervention, including review by the Curriculum Committee, potential structural changes, and specific faculty development. At present, no such interventions are planned or warranted.

In summary, we believe that the size, breadth and location of our hospitals assure that we have more than adequate clinical teaching material for our students, and that the commitment of our faculty, primarily full-time but also voluntary, ensures the availability of more than adequate teaching, mentoring and role-modeling. The adequacy of the institutions, as well as the balance between them, is further assured by our multiple monitoring procedures, including cross-program evaluations of the students, student evaluations of the training sites themselves, and a well-defined system for anticipating and/or responding to inadequacies as they may arise.

C. Teaching and Evaluation

Supervision During Required Clinical Experiences

Clerkship directors ensure that students are adequately supervised in their clinical experiences and responsibilities. Each clerkship has a structure of supervised clinical experiences for students that includes routine meetings with preceptors and residents. Students are supervised by attendings and residents during their required clinical experiences.

Faculty give formative and summative feedback to students. At the end of each clerkship, students are asked specifically about their educational experiences via the Clerkship Evaluation System. They are asked specifically about the adequacy of:
1. Supervision by House Staff
   1 = Poor
   7 = Excellent
2. Supportiveness of House Staff
   1 = Poor
   7 = Excellent
3. Supervision by Faculty
   1 = Poor
   7 = Excellent
4. Preceptor’s commitment to teaching
   1 = unenthusiastic about teaching students
   7 = very enthused by opportunity to teach, maximized learning opportunities
5. Faculty encouragement to think and use knowledge to solve clinical problems
   1 = never asked questions, no chance to develop solutions
   7 = encouraged to think and challenged in constructive way
6. Feedback from preceptors
   1 = feedback inadequate and not useful
   7 = feedback was helpful, both constructive criticism and praise were offered
7. Direct observation by Attendings of portions of patient encounters
   1 = Never
   7 = Frequently (≥ once/week)
8. Received Feedback from Attendings
   1 = Never
   7 = Frequently (≥ once/session)
9. Quality of feedback from Attendings
   1 = Not helpful
   7 = Constructive
10. Sufficient contact with Attendings to enable them to make a fair assessment of students’ knowledge and skills
    1 = Sufficient
    7 = Insufficient
The results of these data for the 2005-2006 academic year are presented below.

### Table ED-1. Clerkship Evaluation Questions related to Overall Supervision of Students

<table>
<thead>
<tr>
<th>Clerkship</th>
<th>1 Supervision by House Staff</th>
<th>2 Supportiveness of House Staff</th>
<th>3 Supervision by Faculty</th>
<th>4 Preceptor’s Commitment to teaching</th>
<th>5 Faculty encouragement to think and use knowledge to solve clinical problems</th>
<th>6 Feedback from preceptors</th>
<th>7 Direct observation by Attendings</th>
<th>8 Feedback from Attendings</th>
<th>9 Quality of feedback from Attending</th>
<th>10 sufficient contact with Attendings</th>
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</thead>
<tbody>
<tr>
<td>Advanced Medicine</td>
<td>5.8</td>
<td>6.2</td>
<td>4.8</td>
<td>5.2</td>
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<td>4.1</td>
<td>5.3</td>
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<tr>
<td>Ambulatory Care</td>
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<td>6.0</td>
<td>5.9</td>
<td>5.7</td>
<td>5.0</td>
<td>5.5</td>
<td>5.8</td>
<td>5.7</td>
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<tr>
<td>Critical Care</td>
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<td>5.3</td>
<td>6.3</td>
<td>5.9</td>
<td>5.2</td>
<td>3.6</td>
<td>4.3</td>
<td>5.4</td>
<td>5.0</td>
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<tr>
<td>Neurology*</td>
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<td>5.7</td>
<td>6.1</td>
<td>6.1</td>
<td>5.4</td>
<td>6.1</td>
<td>3.2</td>
<td>3.6</td>
<td>5.6</td>
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<td>4.6</td>
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<td>6.3</td>
<td>5.7</td>
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<tr>
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<td>6.1</td>
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<td>5.7</td>
<td>5.3</td>
<td>5.1</td>
<td>5.1</td>
<td>5.7</td>
<td>5.3</td>
</tr>
<tr>
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<td>3.8</td>
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<td>4.5</td>
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<td>Medicine*</td>
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<td>5.3</td>
<td>3.7</td>
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<td>5.0</td>
<td>4.3</td>
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</tbody>
</table>

Students report a high level of supervision by house staff across all clerkships with a range of 4.4 - 5.8 on a 7-point scale. They also report a generally high level of supervision (range 3.8 - 6.1 with one exception) by faculty, from whom they receive useful and constructive feedback. However, students report and the data support that students are not observed by attendings as frequently as they would like in several clerkships. These data also are available for each site within each clerkship (see Required Clerkship Forms). While the data in the Surgery Clerkship shows students feel there is adequate supervision by residents, it also suggests that students would benefit from increased, systematic, attending-level supervision, direct observation and feedback.

### Effectiveness of Efforts to Prepare Faculty and Residents for Their Teaching Responsibilities

The OME offers consultation to all departments regarding faculty development of teaching skills. The OME conducts faculty development sessions for individual preclinical science modules and clerkships on an ad-hoc basis and works with all module and clerkship directors in designing their faculty development sessions to enhance teaching skills appropriate to the various teaching modalities (i.e., lecture, conference facilitation, laboratory, bedside teaching, etc.). In addition, the OME directly reaches out to module and clerkship directors when feedback from student course liaisons or data obtained through formal course evaluations suggest the need for design and implementation of an appropriate program/intervention to improve teaching skills of specific faculty. Faculty also may seek support individually. OME, on request, will provide direct observation of teaching sessions in any venue and constructive feedback to faculty.
Preclinical Courses
During the first two years of the curriculum, all courses include small-group exercises in the form of case-based discussions, problem-based discussions, or literature-based discussions. Faculty development sessions which review educational objectives of individual small-group exercises and educational strategies are conducted to prepare tutorial leaders for their sessions. Most small group sessions are preceded by a meeting of the teaching staff and the faculty member(s) in charge of organizing the exercise. Some of these small group exercises are staffed by non-faculty members, including medical professionals such as genetic counselors, post-doctoral fellows, or graduate students. In all cases, the teaching staff (both faculty and non-faculty) are provided with written materials, including the learning objectives of the exercise and the appropriate factual information. For some sessions, faculty are assigned in teams, with a senior faculty member grooming a junior faculty member for greater responsibility. In small group exercises led by non-faculty, multiple sections meet at the same time, with a course director or designated faculty member being available as a ready resource for answering questions which may arise in any of the individual sections.

Evidence of Effectiveness of Efforts in Preclinical Courses
Students have had the opportunity to evaluate lectures, conferences, seminars and preceptors in the aggregate for many years via the course evaluation system. The data presented in Table ED-1 below show generally positive ratings of lectures and conferences, including opportunities for active participation, active discovery and problem solving in conferences for each element of the preclinical years’ curricula. Note especially that facilitators of conferences and seminars are rated very highly on the “facilitator promotes learning” item.

The OME recently improved its capacity to solicit student feedback on individual educational sessions. During the 2003-2004 academic year, the OME began to embed evaluation of each individual teaching encounter in the preclinical course evaluations. All but a few modules in the first year curriculum included this measure for 2005-2006. Beginning in Academic Year 2006-2007, all lectures, conferences and seminars in all preclinical modules may be evaluated on an optional basis by the students via this mechanism. The questions on teaching evaluate both process (i.e., the way in which the sessions are conducted, material resources utilized, and organization) and outcome (i.e., the overall educational experience). Of individually rated lectures (n=278), 70% were rated equal to or greater than 3 (neutral) on a 5-point scale.
### Table ED-2. Preclinical Course Evaluations -- Year One (2005-2006)

<table>
<thead>
<tr>
<th>Course Description</th>
<th>N</th>
<th>Lectures clearly presented</th>
<th>Lectures help understand material</th>
<th>Independent Study encouraged</th>
<th>Opportunities for active participation</th>
<th>Active discovery/problem solving in conferences</th>
<th>Conferences help in understanding material</th>
<th>Facilitator promotes learning</th>
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<td>The n of each cell varies from a range of N=111-156</td>
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#### 2004-2005

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<th>Lectures clearly presented</th>
<th>Lectures help understand material</th>
<th>Independent Study encouraged</th>
<th>Opportunities for active participation</th>
<th>Active discovery/problem solving in conferences</th>
<th>Conferences help in understanding material</th>
<th>Facilitator promotes learning</th>
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<tbody>
<tr>
<td>Morphological &amp; Developmental Basis of Medicine</td>
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<tr>
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Preclinical Course Evaluations -- Year Two (2005-2006)

### 2004-2005

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<th>Course</th>
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<th>Lectures clearly presented</th>
<th>Lectures help understand material</th>
<th>Independent Study Encouraged</th>
<th>Opportunities for active participation</th>
<th>Active discovery/problem solving in conferences</th>
<th>Active Participation in lab/conferences</th>
<th>Lab/Conference helpful in understanding</th>
<th>Facilitator Promotes Learning</th>
</tr>
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<tr>
<td>Host Defense: Mechanisms &amp; Therapeutics</td>
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<tr>
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<td>5.9</td>
<td>5.1</td>
</tr>
</tbody>
</table>

The n of each cell varies from a range of N=110-142
**Clerkships**

For all required clerkships, the clerkship director:

- Provides instructional materials for the faculty and residents detailing the goals and objectives of the clerkship, teaching expectations, specific teaching objectives, and evaluation methods. Clerkship Directors deliver this information via a range of mechanisms—i.e. via e-mails, posts on Clerkship web-sites and/or via scheduled meetings.
- Organizes meetings to describe the clerkship training program to faculty and house staff and to discuss problems that arise during the clerkship.
- Meets with directors of off-site programs to assure uniformity of the teaching program
- Provides feedback to individual faculty regarding how students assess the effectiveness of their individual teaching.
- Provides feedback to site directors regarding how students view their learning experiences at each site.

**Medicine**

The Clerkship director meets with all faculty and residents, including site directors, at the beginning and end of the clerkship to orient everyone to the clerkship objectives and evaluation system. Written instructions are distributed via e-mail to the teaching faculty prior to each clerkship block. Chief residents review teaching roles and responsibilities with the residents.

**Surgery**

At the beginning of each rotation, all residents and faculty are provided via e-mail with instructions on teaching objectives, assessment criteria and methodology, and student orientation procedures. At least once per year, faculty and resident development sessions are held to improve teaching and evaluation skills. In addition, two or three of the department’s monthly faculty meetings are devoted to specific, teaching skills development sessions. Topics of these sessions include “micro-skills” of teaching, providing feedback, adult learning and resident as teacher.

Students evaluate the teaching skills of the residents and faculty with whom they have had contact via an online evaluation conducted by the Dean’s Office. The evaluation form allows students to give feedback on teaching processes and teaching outcomes. This information is given to the clerkship director who then provides each faculty member and resident with a formal evaluation at the end of each academic year. The data can be accessed at the end of each clerkship period if more immediate intervention, either by the clerkship director or Chair of the Department of Surgery, is considered necessary.

**Psychiatry**

The clerkship handbook is distributed to all faculty and residents. Quarterly meetings between site directors and unit chiefs are held to review progress toward clerkship goals and objectives. In addition, each site is formally visited and reviewed by the clerkship director twice per year.

**Neurology**

At the beginning of each academic year, the clerkship directors formally orient the residents to their responsibilities regarding the supervision and teaching of medical students. Residents are evaluated mid-clerkship by the medical students. Based on this evaluation, the course director provides each resident with a formal evaluation of teaching skills. Each faculty member receives a written orientation manual that clearly delineates the goals and objectives of the clerkship as well as the teaching expectations of the faculty. The clerkship director periodically provides each
site director with specific feedback based upon the student evaluations collected after each clerkship rotation by the Dean’s Office.

**Pediatrics**
The clerkship directors formally orient both the faculty and house staff to the goals and objectives of the clerkship at the beginning of each academic year. Throughout the year, there also are required seminars in which residents develop their teaching and supervisory skills, departmental educational committee meetings, and regularly scheduled faculty development sessions.

**Obstetrics/Gynecology**
The clerkship director annually orients faculty preceptors to the goals and objectives of the clerkship, learning objectives (derived from the Association of Professors of Obstetrics and Gynecology) of each of the core didactic lectures, format of the preceptor sessions, and the criteria and methodology for assessment of student performance. Specific preparation of residents for their teaching responsibility has been considered by the current clerkship director to be relatively informal and inadequate. Under his guidance, over the two years since he assumed leadership of the clerkship, formal engagement and preparation of the residents as teachers has increased.

**Critical Care**
All site directors meet annually with the clerkship director to review the goals and objectives of the clerkship. At this time, each site director receives a written copy of the curriculum and, from that point forward, is responsible for orienting his or her faculty preceptors to the curriculum, its objectives and the criteria and methodology for student performance assessment. Residents are introduced to the students at the beginning of each block and, at the current time, the clerkship director recognizes a need for their orientation to be more complete and robust. Despite this perceived deficiency, however, students highly rate not only their learning experiences with faculty, but also with residents, on Critical Care (Table ED-3). This may in part reflect the fact that house staff in the Critical Care sites have been prepared for their roles as teachers through the activities mentioned above in their primary departments.

**Ambulatory Care**
The clerkship director meets with all site directors to review in detail the goals and objectives of the clerkship and the criteria and methods for student assessment. The site directors are then responsible for orienting the faculty at their respective sites. Students interact directly with faculty, and not with house staff, while on Ambulatory Care.

**Advanced Medicine**
Each year the clerkship director provides supervising faculty and residents with written instructions that delineate their responsibilities. There is no additional preparation beyond that provided to faculty and house staff during the course of their preparation for their teaching on the core clerkship in Medicine.

**Evidence of Effectiveness of Efforts in Clinical Clerkships**
Students are asked on their clerkship evaluations to rate their learning experiences while on house staff rounds and attending rounds. Table ED-3 shows that students rate both of these educational experiences highly across all clerkships. Additional attention to preparation of residents and faculty in Surgery and residents in Ob/Gyn is warranted, and this is a current focus of the OME.
### Table B6.5 Clinical Clerkship Evaluations 2005-2006

#### 2000-2001

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Attending Rounds</th>
<th>House Staff Rounds</th>
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</thead>
<tbody>
<tr>
<td>Advanced Medical</td>
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<tr>
<td>Medicine</td>
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<tr>
<td>Neurology</td>
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<tr>
<td>OB/GYN</td>
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<tr>
<td>Pediatrics</td>
<td>4.8</td>
<td>5.6</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>4.8</td>
<td>5.4</td>
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<tr>
<td>Surgery</td>
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<td>4.7</td>
</tr>
<tr>
<td>Critical Care</td>
<td>5.2</td>
<td>5.4</td>
</tr>
</tbody>
</table>

Critical Care was first implemented in 2002.

#### 2005-2006

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Attending Rounds</th>
<th>House Staff Rounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Medical</td>
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<td>Medicine</td>
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<td>Neurology</td>
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<td>OB/GYN</td>
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<td>4.9</td>
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<td>Pediatrics</td>
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</tr>
<tr>
<td>Critical Care</td>
<td>5.5</td>
<td>6.0</td>
</tr>
</tbody>
</table>

*Not applicable to Ambulatory Care

No House staff Rounds in Ambulatory Care

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POOR: 1, <3.5
2, 3
3
4, 3.5 - 4.4
5, 4.5 - 5.4
6, >5.4
EXCELLENT: 7
Future Plans
The OME, ODL and AES are currently in the process of designing a system for delivery of faculty development seminars, workshops and web-based teaching modules regarding teaching skills. A series of faculty development “sessions” will be planned and implemented. Topics will include adult learning principles, facilitating small group teaching, how to give feedback, teaching at the bedside, and special topics in student assessment (e.g., making qualitative comments congruent with quantitative rating scales). These seminars will be available to all faculty across departments and sites with the goal of improving teaching skills.

Recommendation
- Continue to augment the pervasiveness and communication of opportunities for faculty and house staff teaching skills development.

Adequacy of Methods Used to Evaluate Student Attainment of Educational Program Objectives

Preclinical Methods of Evaluation
During the first two years, students are assessed by a variety of methods including:

- Formal examinations which test the students’ mastery of a body of knowledge. This type of assessment is used in all courses.
- Feedback on the students’ progress, usually after a small group exercise. This feedback may include an assessment of a student’s mastery of material, as well as his or her professionalism. This type of assessment is used in some but not all courses; in some cases, as in the Morphological and Developmental Basis of Medicine module, the formative feedback is provided both by faculty and by peers.
- Self-evaluative tools, generally in the form of problems sets and web-based tutorials. These are either currently in use or under active construction by all preclinical modules.
- Formative and summative objective, structured, clinical encounters (OSCEs), in multiple units of the longitudinal Skills and Science of Doctoring module.

Clinical Methods of Evaluation
During the clinical years, students are assessed by:

- A standardized, web-based, student assessment instrument created in 2004 for more equivalent evaluation of students in the clerkships. All clerkships utilize this instrument for assessing students’ in knowledge; physical exam, history and interviewing skills; write-ups; oral presentations, clinical problem solving, procedural and manual skills; and professional development (Appendix ED-26A).
- Evaluation of clinical skills by residents and faculty
- Written examinations
- NBME subject examinations
- Oral Examinations
- OSCEs
- Essays
- Professionalism Development Portfolio entries
- Peer Assessment
- Surgery Skills Lab
• CCSE given at the beginning of the fourth year following the completion of the core clinical clerkships. This exam is designed to evaluate competency in communication, history gathering, physical examination, clinical reasoning and professionalism.

Mix of Testing and Evaluation Methods
There are a broad array of assessment techniques used in the preclinical modules and clinical rotations which measure knowledge, skills, behaviors and attitudes. Efforts are made in each module and clerkship to match assessment techniques to their respective educational objectives. Although we have ample evidence, presented elsewhere, to support the conclusion that our students achieve our overall educational objectives, we are actively engaged in a study of how “deeply” students learn while meeting these educational objectives and how well our assessment strategies match the level of understanding implied in those articulated objectives. To capture the appropriateness and adequacy of assessment strategies as measures of achievement of our educational objectives throughout our curriculum, Module and Clerkship Directors were asked to use Bloom’s Taxonomy of Learning as a guide to determine which levels of learning are evaluated by each of the assessments utilized in their courses.

Cognitive-Knowledge
The mix of testing and evaluation methods reflects a progression of assessments that test all levels/stages of learning, ranging from recall of facts to application, analysis, synthesis and evaluation skills. In general, both the preclinical modules and the core clinical clerkships contain assessments which address each level of learning in the students’ attainment of the course objectives. The preclinical exams tend to be more weighted towards assessment of knowledge and comprehension, while the clerkship assessments shift towards a greater preponderance of higher-order and cognitive assessments of students’ clinical abilities to analyze medical problems, synthesize information and evaluate commonly encountered problems in medical practice.

Affective-Professional Development/Attitudes/Behaviors
One of the principal, affective educational goals of the curriculum is to imbue in students the habits and attitudes of a medical professional and reflective practitioner. The Professional Development Portfolio fosters this goal by creating a formal venue for reflection and for giving formative feedback to students from peers and faculty. At the end of each year, each student is asked to self-assess professional development progress as reflected in his or her own required entries and in the comments added to the portfolio by peers and faculty. This review of submissions and comment cards promotes not only self-reflection, but also self-regulation and self-appraisal, and is congruent with the attainment of educational objectives in this domain. It also should be noted that formal assessment of multiple aspects of professional development occurs in all clerkships via faculty narratives and ratings of professional behaviors using the web-based student assessment tool.

Psychomotor – Procedural Skills
Procedural skills are taught and assessed in all clerkships by observation and feedback. The Surgery Clerkship, in particular, has a Surgery Skills Center in which students practice and receive formative feedback on a subset of their basic surgical skills.

Student’s Perceptions of Evaluation Methods
Preclinical students report on their module and unit evaluations a fairly high level of satisfaction with examinations as a fair test of course material (Table ED-4). They also report that, in general, the ratio of factual recall to conceptual material on exams is reasonable. We have made concerted efforts over the past few years to create more “balance” in examinations in the
preclinical modules, with fewer rote recall items/exercises and greater emphasis on students’ comprehension, synthesis and problem solving skills. The data on sufficiency of constructive feedback will be discussed below.

Table ED-4. Year One (2005-2006)

<table>
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<tr>
<th>Subject</th>
<th>2005-2006</th>
<th>2004-2005</th>
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<td>Exams fair test of course material</td>
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<tr>
<td>Ratio of factual to conceptual material</td>
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<td>Sufficient Constructive Feedback</td>
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<td>Molecular Basis of Medicine: Molecular Biology, Genetics &amp; Biochemistry</td>
<td>5.3</td>
<td>4.6</td>
</tr>
<tr>
<td>Cells and Basic Tissues-Cell Biology/Histology</td>
<td>5.6</td>
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</tr>
<tr>
<td>Cells and Basic Tissues: Immunology</td>
<td>6.3</td>
<td>6.0</td>
</tr>
<tr>
<td>Foundation for Medicine: Epithelial &amp; Neuromuscular</td>
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<td>4.7</td>
</tr>
<tr>
<td>Foundation for Medicine: Cardiovascular &amp; Respiratory</td>
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<td>5.2</td>
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<td>Foundation for Medicine: Renal &amp; Gastrointestinal</td>
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<td>3.5</td>
</tr>
<tr>
<td>Foundation for Medicine: Endocrine &amp; Reproduction</td>
<td>5.2</td>
<td>5.2</td>
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<tr>
<td>Foundation for Medicine: Brain and Behavior</td>
<td>4.8</td>
<td>4.8</td>
</tr>
<tr>
<td>Skills &amp; Science of Doctoring-Physical Diagnosis</td>
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<tr>
<td>Skills &amp; Science of Doctoring-Epi., Biostats, Preventative Med.</td>
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</tbody>
</table>

The n of each cell varies from a range of N=148-156

The n of each cell varies from a range of N=132-143
Year Two 2005-2006

2004-2005

The n of each cell varies from a range of N=120-143
Clinical students report on their clerkship evaluations that they would like more direct observation by faculty of their patient encounters. They agree, however, that the feedback they do receive is useful and constructive. In general, students feel they are adequately supervised by attendings and residents and have had sufficient contact with attendings for attendings to make a fair assessment of their knowledge and skills. Exceptions are evident in this year’s clerkship data in a few sites within three clerkships (see Required Course and Clerkship Forms).

Current third and fourth year students have concerns about the manner in which their clinical grades are determined. In the LCME Student Survey, 63% of the students either disagreed or strongly disagreed with the statement, “Grades for required clerkships are calculated in a fair manner,” and 64% of third and fourth year students disagreed or strongly disagreed with the statement “Grades for required clerkships are representative of student performance/abilities/learning.”

Our approach to this has been multi-pronged. All of the clerkships explicitly explain, at orientation, and either on their websites or in writing, the criteria by which students are assessed and the weights placed on each assessment component. The web-based, standardized, student assessment system in the clerkships has enabled us to centrally consolidate and analyze student ratings and subsequent grading by faculty with more granularity and, therefore, increase our targeted efforts in faculty development around assessment issues. Inter-rater and intra-rater variability can be analyzed more readily, greater distinction among students’ knowledge, skills and professionalism can be made, and the components as well as relative weight of each assessment input are rendered much more transparent. Implemented in 2004 for the Class of 2006, this newly designed instrument also established the groundwork not only for a more consistent approach to assessment across all clerkships, but also for a reduction of clerkship grade inflation.

In addition, for academic year 2006-2007, the Senior Associate Dean for Education and Student Affairs developed, and the Curriculum Committee endorsed, a policy and procedure for grade clarification should an individual student request it. The first step is consultation with the clerkship director, who makes available to the student all evaluative information used in determining a student’s performance and the result obtained when these data are fitted to the “algorithm” by which grades are determined in each clerkship. Students who after that consultation still believe that their clerkship grade is in error can request review of their grade by a panel of three clerkship directors (excluding the director of the clerkship for which the students’ grade is contested), whose decision is binding and can be to either keep, raise or lower the grade. This year, a total of 13 requests from 12 students were reviewed, and one grade change was approved. The responses of some students to these survey questions may reflect dismay or dissatisfaction with this system which differentiates among students to a greater degree and is less subject to individual negotiation than were prior rating systems utilized in the clerkships. Nevertheless, with so many students perceiving that grades are not calculated in a fair manner and that grades are not representative of student performance, continued attention to this issue is warranted.

The data obtained from the students’ clerkship evaluations suggest that another factor may contribute with the Student Survey responses regarding clinical grading. Analysis of clerkship student evaluation data indicates that at certain sites within four clerkships, students perceive they have not had sufficient contact with attendings for them to make a fair assessment of their knowledge and skills (see Required Course and Clerkship Forms). Consequently, if a student felt that his or her grade in any one clerkship was inaccurate, they might have answered the LCME Student Survey items related to grading negatively.
Sufficiency of Formative Assessments

Preclinical students report that they generally receive sufficient constructive feedback in their courses, with two exceptions for this year noted in red (Table ED-4). The data obtained from students on clinical rotations suggest that there are both clerkship- and site-specific variations in the degree of preceptor feedback, attending direct observation, attending feedback, and the level of interactions with attendings charged with assessment of the student’s skills (see Required Course and Clerkship Forms).

In summary, there are sufficient formative and summative assessments as indicated by the types of assessments utilized across the four years of the curriculum. Furthermore, the quality of the feedback students receive from preceptors in clerkships, in both inpatient and ambulatory experiences, is rated generally as helpful, with both constructive criticism and praise being offered.

Table ED-5. Clinical Clerkship Evaluations
2005-2006

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>Advanced Medicine</td>
<td>4.8</td>
<td>4.8</td>
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</tr>
</tbody>
</table>

1=Feedback was inadequate and not particularly useful 7=Feedback was helpful. Both constructive criticism and praise were offered
Direct observation by attendings of portions of students’ clinical patient encounters remains problematic in a number of clerkships and warrants attention (Table ED-1). There are site-specific differences within clerkships (see Required Course and Clerkship Forms). When students receive feedback from attendings, they are generally quite satisfied with the quality of the feedback received, as evidenced in Table ED-1.

**Timeliness of Performance Feedback**

**Preclinical Years**
Informal, formative assessments are either self-graded or are given immediately after specific exercises in the preclinical curriculum. Results of graded exercises are available as soon as possible following the exercises. This is usually within a week of the exercise.

The policy of the School is that all written exams are available to students for review after they have been graded. The School does not have a uniform policy governing the mechanisms that modules may use to make this information available. Some modules return original exams to students. Others do not release exams to students in order to maintain the integrity of a viable question item bank. However, any student can make an appointment to review his/her exam in any module. Some modules conduct a post-exam review for voluntary attendees.

**Clinical**
In 2006, the Dean’s Office implemented a new policy to promote more timely feedback to students during the clerkships, as well as more rapid feedback regarding their final grades. Each clerkship has developed a Mid-Clerkship Feedback Form to be utilized by clerkship directors or by the student’s preceptors in discussion of student performance at the midpoint of the rotation. The Neurology clerkship is the only exception; a four-week clerkship, Neurology gives student feedback in an ongoing way during regularly scheduled clinical experiences. For summative assessments, faculty are asked to evaluate students within a tight, two-week time-frame starting one week prior to the end of the rotation. Those core clerkships which include shelf examinations as one measure of knowledge and one component of assessment must submit their final grades to the Office of Registration and Student Records within one month of the end of the clerkship. This recognizes the average, three-week turnaround time for receipt of the students’ score reports, but clearly requires active engagement by the departmental administrators in facilitating timely submission of student evaluative data by faculty and residents. Expectations of faculty and house staff must be explicitly outlined (along with dates of mid-clerkship formative, summative feedback and end-of-clerkship, online, summative assessment) and made clear, in writing, through clerkship directors/departmental administrators to faculty, house staff, and department chairs.

Although we have made great progress in the timeliness of return of clerkship grades to students, the process did suffer several “bumps,” particularly during the first year of implementation of the web-based system; working with Medical Center IT toward streamlining this process and facilitating web-based ease of access and coordination of information across OME, Office of Registration and Student Records, teaching faculty and students is a major, current, cross-departmental activity of the School of Medicine.

**Recommendations**
- Evaluate the content, style and structure of the preclinical examinations with regard to the level of cognitive challenge and the educational objectives to which the assessments are linked.
• Continue to work on development and implementation of methods to increase the frequency of direct faculty observation and quality of constructive feedback offered across the curricular program, but particularly in the clinical clerkships.
• Continue to strengthen both transparency and awareness of transparency in the clerkship evaluation/grading process.
• Establish a robust, coordinated, integrated, web-based system that links prompt, clinical clerkship evaluation by the students with timely return to students of their own final assessments and grades.

Acquisition of Core Clinical Skills

Preclinical Curriculum
Training in the core clinical skills actually begins during the new student orientation with a session devoted to protection of patient privacy. This training continues in the two-year Skills and Science of Doctoring module, which includes the Physician, Patient & Society, Epidemiology, Biostatistics & Preventive Medicine, and Physical Diagnosis units. In the first year of this module, students meet regularly with a clinical preceptor who provides formative feedback on their progress. Small group conferences provide additional clinical curricula training in the basic skills of doctoring, (i.e., listening to the patient is narrative, cultural sensitive patient-physician communication, ethical considerations, measuring vital signs, etc.) Professional development is emphasized. In the second year of the Skills and Science of Doctoring module, students learn core history taking and physical diagnosis skills and develop a sound foundation in evidence-based medicine and population health.

In all modules throughout the first year, the principles of basic science are presented in clinical contexts. Each student’s mastery of this material is evaluated through formative and summative assessments which include web-based tutorials, OSCEs, papers, oral presentations, case-based problem solving, and evaluation of professionalism. Student progress is discussed at meetings of the Preclinical Board on Academic Standing, comprised of all preclinical unit directors, the Senior Associate Dean for Education and Student Affairs, the Associate Dean for Education and the Associate Dean for Students Affairs, who chairs the group. At these regularly scheduled meetings, appropriate remediation for students in academic difficulty is determined, an implementation plan developed, and subsequent progress of students monitored.

Clerkship Orientation
In order to prepare students for their clinical clerkships, OME and the Clerkship Directors have designed and implemented a core, mandatory, two-week curriculum, held after the second year, that prepares students to “hit the ground running” on their clerkships. This multidisciplinary, transitional program is designed to bridge the gap between the preclinical and clinical experiences. In this phase of clinical skills development, emphasis is placed upon cross-discipline and cross-clerkship commonalities in acquisition, organization, and interpretation of patient information. It stresses evidence-based reasoning as a guide to differential diagnosis and the skills of professional behavior which are required of members of an interdisciplinary healthcare team. Orientation sessions include hands-on experience in the following areas:

- Advanced Cardiac Life Support (ACLS I&II)
- CPR recertification
- IV insertion/Venipuncture training
- Fundoscopy Workshop
- Ear Nose & Throat (ENT) Workshop
Core Clinical Skills in the Clerkships

To graduate, all students must take and pass the nine required clerkships: Ambulatory Care, Advanced Medicine, Critical Care, Medicine, Neurology, Obstetrics & Gynecology, Pediatrics, Psychiatry, and Surgery. Within each clerkship, there are specific assessments of clinical skills based upon respective objectives. In all clerkships, students receive feedback so that they may understand and remediate their deficiencies. There are an array of formative and summative assessments, including OSCEs, faculty/resident ratings, papers, oral presentations, direct observation of clinical skills, problem solving of case vignettes, journal clubs, and evaluation of professionalism. Any student who has academic difficulty within a clerkship is discussed at meetings of the Clinical Board on Academic Standing, comprised of all clerkship directors, the Senior Associate Dean for Education and Student Affairs, the Associate Dean for Education, and the Associate Dean for Student Affairs, who chairs the group. At these regularly scheduled meetings, appropriate remediation for students in academic difficulty is determined, an implementation plan developed, and subsequent progress of students monitored.

In nearly all clerkships at most sites students are satisfied that they have sufficient contact with attendings to enable a fair assessment of their knowledge. However, there are sporadic reports of insufficient contact with attendings from the student perspective. The centrally-designed and centrally-implemented CCSE ensures that all students acquire the core clinical skills.

CCSE

As of June 2005, all rising fourth year medical students are required to pass an eight-station CCSE. Implemented in June 2004, this exam is designed to evaluate student competency in communication, history gathering, physical examination, interpretation of diagnostic tests and clinical reasoning upon completion of the core clinical clerkships.

Defining the Competencies and Cases

Over the course of the 2003-2004 academic year, a core team of medical educators with extensive experience in standardized patient (SP) assessment worked closely with the clerkship directors and the Dean’s Office to develop the CCSE. A panel of cases is selected for each yearly CCSE to provide a balanced assessment of competencies representative of all core clerkships.

CCSE Evaluative Instrument Development and Refinement

To assess student performance, we developed SP checklists for each case to measure skills in three competency areas: communication, history-gathering, and physical examination. Assessment tools also were developed by our team of medical educators to evaluate the students’ clinical reasoning (synthesis and interpretation) based on interpretation of a diagnostic test or documentation of a patient note. Each year, the cases and checklists are refined based on
feedback from pilot sessions prior to implementation within the exam. Each year, the CCSE Coordinator recruits two SPs for each case and makes all efforts to address rater reliability, employing rigorous and standardized methods of training and quality assurance through faculty observation, feedback and coaching of our SPs.

**CCSE Structure and Implementation**
Students participate in the CCSE during the first two weeks of the fourth year of medical school in sixteen half-day sessions (up to 10 students per session). Each year, the School negotiates for clinic space from one of the institution’s teaching hospitals, thereby providing a realistic setting for the exam.

**Debriefing and Satisfaction**
A medical educator from the CCSE team leads a debriefing at the end of each day for all students who participated on that date. Students also complete a post-CCSE survey assessing the acceptability, clinical relevance and perceived educational value of the experience. Generally students report satisfaction with the CCSE as an assessment of their skills and as preparation for the Step 2 – Clinical Skills exam. Students report that the challenge of undifferentiated cases is especially valuable to them.

**Student Evaluation and Feedback**
Students are evaluated based on the standardized checklists as completed by the SPs in each of the 8 stations and the faculty scoring of patient notes, oral presentations, and interpretation of diagnostic tests. Students are provided a confidential, written report of their performance. An overall grade of pass/no credit is given based on each student’s overall results on the CCSE. This grade is included on the student’s transcript. A grade of no credit is given to students falling in the lowest decile in 2 or more competency areas (communications, history, physical examination, clinical reasoning). In addition, students receive a detailed report of their results within each competency area that compares their individual performance to the overall performance of the cohort.

**Remediation**
Students failing the exam are referred for specific remediation. Remediation culminates with a 2-station SP encounter that the student must pass to be considered fully remediated.

**Evaluation of Program Effectiveness**
Performance on National Board Exams Step 2:
That our students have acquired the core clinical skills is evidenced by the pass rates on the Step 2 exams.

**Step 2 – Clinical Skills:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number Examined</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004-2005</td>
<td>165</td>
<td>96%</td>
</tr>
</tbody>
</table>

**Step 2 - Clinical Knowledge:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number Examined</th>
<th>Percent Passing</th>
<th>Mean Total Score</th>
<th>National Mean Total Score</th>
</tr>
</thead>
</table>
Resident Evaluation by Program Directors
A second indicator that confirms adequacy of our system for ensuring acquisition of core clinical skills is the annual evaluation of our graduates by their respective program directors at the end of their PGY1 years. Our graduates are consistently rated higher than or equal to their cohorts in each performance characteristic assessed.

Limitations
Limitations of the school’s ability to ensure that the clinical skills of students are appropriately assessed may occasionally surface in the number of faculty available to precept students in certain clerkships and at certain sites within the clerkships. We have a large pool of faculty from which to draw in the assignment of teaching responsibilities. However, increased clinical productivity demands can adversely affect teaching and assessment efforts. To balance these competing requirements of our faculty’s time, we now have clear faculty expectations with regard to teaching stipulated in the Report of the Committee on Expectations Regarding Teaching. Furthermore, with the implementation of the CCSE, we have created a rigorous, centralized, evaluation system to ensure student clinical skills proficiency regardless of incidental lapses in the system.

There are some limitations to evaluating students’ clinical skills via OSCEs and simulated patients imposed by lack of a formal Clinical Skills Center facility in which to conduct the CCSE and other clinical skills exams. We conduct formative and summative OSCEs and the CCSE by setting up and breaking down in borrowed, non-dedicated sites throughout the campus on an ad hoc basis.

Recommendations
- Continue efforts to increase the level of engagement of all clinical faculty in the teaching and assessment of knowledge, skills and professionalism throughout all four years of the educational program.
- Establish a Clinical Skills Center for actual and simulated patient encounters and scenario training that can be used for learning and assessment of achievement of pertinent educational objectives across all four years of the undergraduate medical education program, as well as in graduate and postgraduate medical education.

D. Curriculum Management
Mechanisms and Assessment of Adequacy

Curriculum Committee
The Curriculum Committee of the School of Medicine directly assumes institutional responsibility for the curriculum and provides global oversight of the educational program. This integrated body includes members of the faculty, administration, and student body in proportions appropriate to assure wide understanding of the issues and objectives at hand, flexibility, a lack of bias, and full representation across the institution, in order to achieve the school’s overall educational objectives.
The Curriculum Committee provides this service in the larger framework of oversight for education, as headed by the Dean’s Office. The Curriculum Committee, charged by Dean Glickman, works in the best interests of the institution without regard for parochial or political influences, or departmental pressures. The purpose of the Curriculum Committee is to both prospectively and retrospectively evaluate the curriculum of the School. The objective of the Committee’s work is to ensure a coherent and coordinated curriculum for the MD degree. The curriculum is continuously monitored (see Current Methods of Curriculum Review) to ensure that gaps and unwanted redundancies do not occur. Additionally, the Committee is responsible for making recommendations to the Dean on opportunities to improve the curriculum. Of note, however, no formally documented charge for the Curriculum Committee (e.g., bylaws or written mandate from the Dean) could be identified.

The OME, under the Senior Associate Dean for Education and Student Affairs and directed by the Associate Dean for Education, is intimately involved in curriculum design, implementation, and evaluation. The OME meets three times monthly with the preclinical module directors, clerkship directors, and in joint meeting with both to assure vertical coherence, integration and attainment of educational objectives across the four years of the program for the MD degree. The workings of these groups are forwarded directly to the Curriculum Committee for review as needed.

There are two subcommittees of the Curriculum Committee which report through the Senior Associate Dean for Education and Student Affairs: 1) Basic Science Module Directors and Students Subcommittee; 2) Clinical Science Clerkship Directors and Students Subcommittee. Both subcommittees serve as a direct line of communication between students and the module and clerkship directors, and provide ongoing feedback and a venue for rapid identification and remediation of issues that arise while the modules and clerkships are in progress. These subcommittees report periodically to the Curriculum Committee on the quality of the modules and clerkships and communicate, through the Student Caucus organized by the Student Council, broadly to the medical student community. Each committee is composed of the module or clerkship directors, respectively, the course or clerkship student liaisons, and the Senior Associate Dean for Education and Student Affairs.

Composition of the Curriculum Committee
Membership on the Curriculum Committee is designed to offer depth and breadth of expertise in curricular design, pedagogy, and evaluation methods. The current Curriculum Committee is co-chaired by Benard Dreyer, MD and Melvin Rosenfeld, PhD. Dr. Dreyer is Vice Chair of the Department of Pediatrics and Dr. Rosenfeld is Co-Director of the Foundation for Medicine module. The composition of the body of the Curriculum Committee ensures representation from the module, unit, and clerkship directors, members of the Graduate Medical Education (GME) office, clinical affiliates, student body, Dean’s Office, and two to three individuals who are not directly involved in the daily instruction of students in elements of the core curriculum. The Committee membership and the appointment of the Chairs are approved by the Dean.

In addition to the co-chairs, the Curriculum Committee Roster includes:
- Michael Postow, Medical Student, Class of 2007
- Bruce Bogart, PhD, Module Director
- Carol Bernstein, MD, Associate Dean for Graduate Medical Education
- Lawrence Smith, MD, Chief Academic Officer, North Shore/LIJ Health System
- David Seubert, MD, JD, MBA, Clerkship Director, Obstetrics & Gynecology
- Jan Vilcek, PhD, Module Director
- John Thomas, PhD, Module Director
Current Methods of Curriculum Review

Individual modules and clerkships are regularly and systematically reviewed through obtaining formal student feedback, faculty feedback and analysis of student performance on standardized examinations, performance-based assessments, and other modalities.

Student Feedback

The Dean’s Office and Curriculum Committee rely extensively on students’ feedback about the educational program. An improvement to the methods of curriculum review since the last LCME accreditation has been the development of standardized, online module and clerkship evaluations to collect student feedback. Students are expected to complete online evaluations of each unit/module and clerkship, which are then received and analyzed by OME. This allows for the production of detailed and timely reports (at the end of each module for preclinical years, at mid-year and end-of-year for clerkships) which are forwarded to course and clerkship directors and to the chairs of the departments collaborating to deliver these integrated elements of the curriculum. Such reports allow course and clerkship directors to identify both strengths and weaknesses, look at trends over time, and make comparisons to other relevant courses. Any required course or clerkship that receives an overall satisfaction rating of $\leq 4$ (on a 7-point scale) is automatically referred to the Curriculum Committee and given the opportunity to present the educational issues surrounding the satisfaction rating. OME troubleshoots any weakness in the curriculum noted either within or across modules or clerkships and works with individual directors or with a group of directors, respectively, to modify or create new curricular elements to correct those weaknesses.

In addition to these standardized course evaluations from the dean’s office, each course/module has a Student Course Liaison, appointed by Student Council, whose function is to provide in-the-moment feedback to unit/module directors and to clerkship directors concerning issues of content and logistics. Student Liaisons allow module and clerkship directors to learn, in a timely fashion,
when students require further clarification on an aspect of the curriculum. Importantly, students are active members on the Curriculum Committee as well as of the Basic Science and Clinical Science Curriculum subcommittees.

**Faculty Feedback**
Faculty input regarding curriculum is highly regarded and actively sought by the Curriculum Committee and Dean’s Office. Module and clerkship directors communicate frequently with one another and with the Dean’s Office about the curriculum during both regularly scheduled monthly meetings and in intensive, working sessions to plan and monitor courses (as during the development of the modular system currently in place, in which different disciplines worked together to develop an integrated curriculum and reduce redundancies).

**AAMC Questionnaires**
The Dean’s Office continues to carefully analyze the AAMC Matriculation and Graduation Questionnaires to look for additional indicators from our students which can help us identify and evaluate the strengths and any potential weaknesses of our program. These data are statistically analyzed, tracked over time and shared with appropriate constituencies.

**Student Examination Scores**
Student scores on written exams (e.g., shelf exam scores for clerkships) and performance-based assessments (e.g., the newly instituted CCSE) used by unit/module and clerkship directors not only to assess individual student performance, but to assess the curriculum by looking at overall class results. For example, clerkship directors can receive a breakdown of results of overall student performance on their relevant shelf exam, comparing how the students as a group compared to the national mean on specific components of the curriculum (e.g., the pediatric shelf reports include separate results on development, prevention, neonatology, etc.). Overall student results on the CCSE are reported on a yearly basis to the Curriculum Committee and clerkship directors, allowing the committees to identify strengths and weaknesses of the clinical skills of the class as a whole and sparking discussion of curricular change to address areas where class skill level is below the committees’ expectations.

**Monitoring of Gaps and Unwanted Redundancies**
Through the development of the new modular system for Years One and Two, basic science faculty members across disciplines continue to work together to develop and monitor integrated curricula based on organ systems. Module directors meet at least monthly with the Senior Associate Dean for Education and Student Affairs, Associate Dean for Education and the Curriculum Coordinator to address both interdisciplinary curricular content and exam content. This approach has reduced unwanted redundancies and fostered systematic reinforcement through planned redundancies and upward spiraling of complex concepts. Redundancies in exams have been reduced through the creation of a centralized exam-item database. In addition, the faculty has collaborated on the creation of many core clinical cases which are utilized to create both the interdisciplinary curriculum as well as summative and formative assessment items.

While the Curriculum Committee actively seeks gaps and redundancies through the above methods of curriculum review, the School does not yet have a searchable curriculum database management tool to more efficiently and effectively search for gaps and redundancies throughout the entire curriculum. The School of Medicine utilizes CurrMIT only minimally. The OME has identified the need for a Curriculum Management database to the Education Committee and has been working with AES, Medical Center IT, and the Library to identify and implement or build a system that would suit our needs. The OME, AES and the Library have recently identified tools
at various other medical schools to be evaluated for potential collaborative use at NYU. It is clear that such a tool would offer great advantages to the School in the area of curriculum management.

**Resources and Authority of the Chief Academic Officer**

Dean Robert Glickman is the Chief Academic Officer at the NYU School of Medicine, delegating operational responsibility for curriculum oversight to Steven Abramson, MD, Vice Dean for Education, Faculty & Academic Affairs and Veronica Catanese, MD, Senior Associate Dean for Education and Student Affairs.

In their endeavor to design and manage the educational program at the School of Medicine, these deans are supported by a large and diverse staff of highly trained faculty. Evidence of the faculty’s commitment to teaching is noted by the Faculty Council’s recent endorsement of the Report of the Committee on Expectations Regarding Teaching. This report states that an appointment at the School of Medicine requires teaching as part of one’s career, and that advancement requires a dedication to excellent, effective teaching in the context of a research university. Full-time members of the faculty are expected to contribute at least 50 hours per year to teaching activities if so requested by their Chairs. Members of the voluntary faculty are expected to contribute at least 20 hours per year to teaching activities if so requested by their Chairs. To facilitate the documentation of such teaching, the School is currently developing a web-based Teaching Record.

While the Dean’s Office is committed to securing appropriate resources to assure the effective delivery of the educational program, limitation of physical space is an ongoing and challenging problem to address. For example, the School has a very active performance-based assessment program throughout the four years of medical school, but there is no space specifically allocated to administering such exams at the current time. The CCSE alone requires the use of ten exam rooms, several small conference rooms and administrative space in close proximity for eight full days over a two week period. While the Dean’s Office has committed to developing a state-of-the-art Clinical Skills Assessment Lab/Center including adequate space for performance-based assessments, movement on the project has been stalled due to the inability as of yet to identify adequate space and financing for such a center.

There are some areas in support and services that also still need to be addressed. IT support will need to be expanded given the many curricular endeavors, both in teaching and assessment, which are currently under development. Finally, the administration of some required educational programs has been supported in part by funding from educational grants which are limited in their duration. The School must continue, as it has done to date, to plan forward to ensure that such successful programs will be “institutionalized” and supported by the Dean’s Office.

**Recommendations**

- Articulate a formal, documented charge to the Curriculum Committee from the Dean of the School of Medicine.
- Identify and implement a more robust curricular management system.

**Effectiveness of Curriculum Planning**

The current curriculum follows the blueprint established by the Task Force on Curriculum Policy 2001. This curriculum was the product of an 18-month effort, headed by Steven Abramson, M.D., then Vice Dean for Education and now Vice Dean for Education, Faculty & Academic
Affairs that involved members of the Dean’s Office, basic and clinical science faculty and students. Please see http://endeavor.med.nyu.edu/curriculum/TaskForceReport.html for further information. Curriculum 2001 was subsequently endorsed by the Curriculum Committee, the Council of Chairs, the faculty and the Dean. It was implemented under the direct guidance of the current Senior Associate Dean for Education and Student Affairs, Veronica Catanese, M.D.

Curriculum Design
In the preclinical courses, units and module directors develop and refine specific learning objectives and plan curricular events four to six months before the start of each module; they do so in conjunction with the Senior Associate Dean for Education and Student Affairs, Associate Dean for Education, Curriculum Coordinator and the co-chair of Curriculum Committee. A similar process is used for assuring articulation, communication and monitoring of achievement of learning objectives in each of the core clinical clerkships; the Senior Associate Dean for Education and Student Affairs, Associate Dean for Education, Curriculum Coordinator and the co-chair of the Curriculum Committee collaborate with the clerkship directors to achieve these goals. As stated above, there are, at minimum, monthly meetings of each of these groups and, most recently, a monthly joint meeting of both groups. Often, in periods of new initiatives, such as development of new cross-disciplinary exercises in the preclinical modular curriculum, implementation of the standardized, online clerkship assessment program, development of the clerkship orientation program, and inauguration of the CCSE, biweekly meetings are held. Through their faculty members who lead the modules, department chairs remain engaged in and accountable for content of both the preclinical (interdepartmental) and clinical (departmental) curricular elements.

Role of the Curriculum Committee
The Curriculum Committee plays a key role in reviewing the effectiveness of the current curricular program, assessing the need for both reactive and proactive curricular change, and monitoring the success of the implementation plans for all aspects of a dynamic curriculum within the context of the mission, goals and objectives of the School of Medicine. Each year, the evaluation data from all preclinical modules and clerkships are presented to the Curriculum Committee by the Associate Dean for Education. All units, modules or clerkships which receive an overall satisfaction score on student evaluations of 4 or below on a 7-point scale are examined in depth by the Curriculum Committee. In conjunction with the OME, the Curriculum Committee designs a specific plan for addressing the deficiency, and receives at least biannual progress reports on the problem area until the deficiency is corrected.

Additions to and deletions from the curriculum, changes in learning objectives, and/or changes in the methods of student assessment require formal presentation to, and approval by, the Curriculum Committee. With the adoption and implementation of Curriculum 2001, the School established formal guidelines which place an upper limit on average weekly contact time, daily lecture hours, and number of weekly conferences that require student preparation. These guidelines inform curriculum planning in the working sessions of the preclinical module directors as well as the clerkship directors. As a result, all proposals to the Curriculum Committee for additions to the curriculum also incorporate suggestions for curricular content that, given the dynamic face of biomedical science, might be eliminated. In this way, both the Curriculum Committee and the working groups of curricular leaders assure that students have sufficient time for learning.

Evaluation of Curriculum Planning Effectiveness
The effectiveness of the curriculum planning process is evaluated in several ways.
• Performance of students on in-house and national examinations is one standardized metric.
• Longitudinal data on student preparedness shared by the OME horizontally across modules, vertically across all four years of the undergraduate medical program, and with the Curriculum Committee is another powerful method for judging effectiveness of the curriculum in providing the requisite training.
• Student assessment and critiques of the modules and clerkships are important measures of curricular planning success. This assessment is achieved through a robust ‘in house’ evaluation system, monthly meetings of the Basic Science and Clinical Science Student Subcommittees of the Curriculum Committee, the annual AAMC GQ, and the annual residency program directors’ assessments of our graduates.
• The Associate Dean for Education prepares and provides extensive data and data analysis (the “metrics”) on each module or clerkship, as well as target evaluation of new initiatives, to the directors of each unit within the module, the relevant clerkship directors, and the chairs of the involved departments.

Effectiveness of Procedures for Rectifying Identified Problems
The previous discussion suggests that the process of identifying problems in the curriculum in general, and in individual modules or clerkships in particular, is robust and efficient; the procedures for rectifying those identified problems, in turn, are quite effective. That effectiveness is readily demonstrated by noting both additions and modifications to modules and clerkships successfully implemented in the curriculum in response to problems identified by the Curriculum Committee, and by tracking trends in the assessments of such curricular additions/modifications over time. Two examples, one drawn from the preclinical curriculum and the other from the clinical curriculum, illustrate the effectiveness of the process for rectifying identified problems.

Preclinical Curriculum
The successful implementation of the new integrated Curriculum 2001 is one of the best examples of a positive change in the curriculum in response to the first major issue outlined above. Twelve multidisciplinary and interdisciplinary modules were created, applying both vertical and horizontal integration. Success in this endeavor can be demonstrated by review of both the favorable student ratings after these revisions as well as the continued excellence in performance of our students on the USMLE Step 1 examination.

An example of successful identification and rectification of deficiencies in a specific unit within a module is the recent process by which problems of leadership and educational quality in the Immunology unit were addressed and corrected. Based upon data provided to the Curriculum Committee by the OME, the Committee recommended that the then new Chair of Pathology and the Senior Associate Dean for Education and Student Affairs co-chair a subcommittee to analyze the problems and propose a strategy and plan for addressing them. In response to the recommendations of this subcommittee, changes were approved by the Curriculum Committee and Dean, and then implemented. The effect was dramatically positive, as reflected both by improved quantitative evaluation scores (e.g., overall satisfaction rose from 3.1 in 2003-2004 to 6.5 in 2004-2005) and qualitative statements on the strengths and weaknesses of the unit.

Clinical Curriculum
One of the challenges identified by the Curriculum Committee in conjunction with the OME over the interval between the last institutional self-study and the current one was insufficient preparation of students for smooth and seamless entrance into clinical training. In response to this deficiency and to the charge from the Curriculum Committee to address it, the Clerkship
Orientation program, a core, required, two-week element of the curriculum for rising third year students, was designed and implemented in June 2002 for the Class of 2004. Over the prior nine-month period, all of the clerkship directors met at three to four-week intervals with the Senior Associate Dean for Education and Student Affairs, Associate Dean for Education and the Curriculum Coordinator to develop the goals, objectives, strategies and implementation plan for the required, two-week Clerkship Orientation for rising third year students. As with any other addition to the curriculum, the plan was presented to and approved by the Curriculum Committee before inauguration. Student feedback on the orientation is reviewed on an annual basis by the clerkship directors, OME and the Curriculum Committee, and modifications are made each year on an ongoing basis. The effectiveness of this iterative process is demonstrated by the positive student feedback (see 5-point scale below) and by highly favorable knowledge, skills and professionalism ratings of our third and fourth year students by their clerkship faculty preceptors and teaching residents.
New York University School of Medicine
Educational Value
Clerkship Orientation 2006

Curriculum Planning Participation and Resources
The Curriculum Committee, working with the Dean, works to ensure appropriate participation in curriculum oversight and planning at the policy level. Curriculum planning requires integration both across the four years of medical school and among different, concurrent educational modules. The composition of the Curriculum Committee is designed to offer depth and breadth of expertise in curricular design, pedagogy, and evaluation methods. Horizontal and vertical curriculum development and implementation are coordinated through three monthly meetings: one each of the preclinical module directors, clerkship directors, and a joint meeting of both groups charged with achieving the School’s educational program objectives. Each working group is led by the Senior Associate Dean for Education and Student Affairs, who directly ensures implementation of changes and innovations endorsed by the Curriculum Committee. The School’s commitment of resources to curricular planning is embodied in its provision of the central resources in the OME, including those of AES’s “R&D” group and the Medical Education and Technology Program. In combination, these resources of the OME provide leadership in curricular planning, design, innovation, implementation and evaluation. Other resources directly provided by the School include those in support of curriculum coordination across all four years of the integrated curriculum. This three person group, led by Eileen Cahill, MPA, is responsible
for working directly with preclinical module directors, maintaining the curriculum management system, calendaring and scheduling all preclinical curricular elements and the Advanced Science selectives, creating and maintaining a robust summative and formative database of examination materials, and supporting collection and interpretation of data on curricular evaluation. In addition, the Dean’s Office and the departments provide financial support for an administrator for each core clerkship, and OME meets monthly with those clerkship administrators to ensure efficient and effective utilization of the web-based student assessment system and assist in creation and resource identification for each clerkship’s website.

Providing Sufficient Time for Learning
Three methods are used to ensure that students have sufficient time for learning:

1. Guidelines for the amount of contact time, as well as the number of conferences requiring student preparation, per week
2. Student feedback
3. Student performance

Study Time Guidelines
The School maintains its dedication to providing opportunities for active learning and significant quantities of unscheduled time to prepare for classes and assimilate new material. Even before the last LCME self-study, the Curriculum Committee endorsed the guidelines of no more than an average of 20 hours/week of in-class time and no more than three weekly conferences for which student preparation is required. This both limits the amount of new material presented and provides students with ample out-of-class study time. The Curriculum Committee acts through the OME and specifically the Curriculum Coordinator, who works with the module directors to design the weekly schedules and, in so doing, monitors weekly class hours. Because all proposals for additions to the curriculum require a comprehensive proposal that includes analysis of the effect of the new curriculum on contact time, the Curriculum Committee is critically involved in assuring that students have sufficient time for learning. Currently, first year students average 21 scheduled in-class hours per week, and second year students average 17 scheduled in-class hours. Beyond the daily non-class hours available for studying, module directors also frequently incorporate supplemental study time during pre-examinations periods in their curriculum planning and scheduling.

Student Feedback
The Curriculum Committee also uses student feedback as a means of assuring that students have sufficient time for active learning and study. Student leaders provide direct feedback to the Curriculum Committee, module leaders and clerkship directors through representation on the Curriculum Committee, Preclinical and Clinical Student/Faculty Subcommittees of the Curriculum Committee, and through service as Student Course and Clerkship Liaisons. Student Course Liaisons are selected through an application process coordinated by Student Council at the beginning of the school year. Their responsibilities are to communicate frequently with module directors to provide in the moment feedback concerning issues of course logistics and content and to relay responses back to students in a timely fashion. In some modules, the directors meet monthly for lunch with an even broader group of interested students; this forum provides an additional mechanism for concurrent feedback regarding “in progress” curriculum.

Student Performance
Student performance is another marker of the sufficiency of time dedicated to learning. Unit and module directors meet regularly to review aggregate student performance on exams and other assessments. Data on aggregate student performance are used to identify areas of the curriculum
which require more attention and learning time; the data also provide an overall indication of whether students have sufficient time allotted for learning the material assessed. The consistently high performance of students on unit and module examinations, OSCEs, and standardized assessments such as the clinical shelf examinations and the USMLE comprehensive examinations supports the conclusion that students have sufficient time for learning.

Workload and Balance Between Education and Service in the Clinical Years
Clerkship directors design the structures and schedules of the individual clerkships to maximize the balance between patient-based and formal teaching. The clerkship directors also specifically define the type (actual, virtual or vignette-based) and quantity of patient encounters (actual, virtual, or vignette-based) necessary to fulfill the stated objectives of each clerkship; students keep a log of these encounters.

Workload and the balance between education and service in the clinical years are monitored through the clerkship evaluations completed by the students, direct feedback to the clerkship directors through the Clinical Science Student and Faculty Subcommittee of the Curriculum Committee, and direct feedback obtained at “end-of-clerkship,” debriefing luncheons in many clerkships. On the formal clerkship evaluations coordinated by the OME, students are asked specifically if they are “required to perform inappropriate/ disproportionate ancillary services.” These evaluations are reviewed by the OME and the clerkship directors. The School applies the following guideline for assessing whether ancillary services performed during clerkship activities are acceptable or not. Although it acknowledges that service to the medical team improves the learning environment, the School considers a pattern of activities which are non-educational or assignment of a disproportionate share of the non-educational clinical activities to students as not acceptable.

Formal Teaching During the Clinical Clerkships
Each of the clerkships has a defined core curriculum and a program of core lectures and preceptor or tutorial small group conference and bedside teaching rounds that form the structural framework upon which continual, in-the-moment teaching and learning also occur. Formal teaching ranges from 5-8 hours/week in clerkships such as Psychiatry, Ambulatory Care, and Surgery, and averages between 10-15 hours/week in the other core clerkships. Because of the nature of the Advanced Medicine clerkship and its direct relationship with the residency training program in Medicine, a student’s formal, didactic educational experience may vary according to both clerkship site and clerkship timing. In the Critical Care clerkship, in which students gain clinical experience in acute medical care in the Medical, Neonatal, Pediatric, Surgical or Coronary Care units or in the Emergency Department, this issue is addressed by a shared core curriculum across sites; most recently, the leadership of the Critical Care clerkship has been working under the guidance of OME to develop core “simulation exercises” to ensure equivalent experience and attainment of clerkship goals and objectives. Whether such an innovative approach would enhance the educational experience still further in the highly successful Advanced Medicine clerkship should be fully explored.

E. Evaluation of Program Effectiveness
Evidence for Achievement of Institutional Objectives

The School of Medicine believes that its institutional educational objectives are achieved by its medical students. Evidence supporting that conclusion includes:

1) Performance on USMLE Step I and II licensing examinations
2) Performance on internal NYUSoM evaluations and examinations
3) Graduation rates
4) Acceptance into national highly-ranked residency programs
5) Evaluation of NYUSoM graduates during the first year of their postgraduate training by residency program directors

USMLE Step I and II Examinations
Review of student performance on the USMLE Part I and Part II exams shows that on Part I, our students have averaged a mean score of 228.3 ± 18.0 over the last seven years (1999-2005) as compared to a national mean score of 215.9 ± 23.4, or about 13 points higher for the School cohort. In some years the performance of the School cohort of students exceeded that of the U.S. mean by nearly one-half of a standard deviation. Over the seven years, the passing rate for the School of Medicine was 98.3% vs. 91.9% for the national cohort, a difference of about 6 percentage points. The performance on Step II is comparable, with a School, seven-year student average of 220.4 ± 22.4 compared to the national average of 215.4 ± 23.3. The passing rate for Step II for our students over that time period was 97.4%, whereas the national passing rate was 95%.

Analysis of these data shows that while our student performance is better than that of the national cohort, the difference is less significant for Step II than for Step I, and the passing percentages are less divergent for Step II than for I. Of note is that while the national scores remain stable at 215, the mean Step I score for the School of 228.3 falls to a mean of 220.4 on Step II. One possible explanation for the lower relative performance on Step II than on Step I by our students is that taking or passing the USLME exams had never been a requirement for promotion or graduation at the School of Medicine. Although students, with rare exceptions, did take Step I at the end of the second medical school year and before the third year clerkships, many did not take Part II in as timely a manner. Between the time of the last LCME visit and prior to the 2004-2005 academic year, students could complete what are now required third year clerkships up until December of their fourth year of medical school. Since 2004 (with the Class of 2006), all medical students complete their core rotations in Medicine, Surgery, Pediatrics, Ob/Gyn, Psychiatry and Neurology during their third year. Review of the Step II examination dates of the 30 students who failed the exam over the last seven years reveals that 8 of them sat for the exam after graduation, of the other 22, 20 took the exam in the spring semester of their fourth year. Thus, of the 30 failing students, only 2 of them sat for the Step II exam in what might be considered a timely manner, (i.e., shortly after the end of the core clerkship-intensive third year). The School now strongly expects students to take Step I before beginning their clerkships and advises them to take Step II early in the beginning of the 4th Year. Students are required to take both Step I and Step II of the USMLE Licensing Examinations prior to graduation; at the present time, passing grades are not required for promotion and graduation.

Evaluation, Examinations and Graduation Rate
Review of students’ academic performances on evaluations and examinations during the clinical clerkships shows that over the last seven years (Classes of 2001 to 2007) no more than 10% of our students experienced some academic difficulty in any one year. The range was from 5 to 17 students in a class of about 160 students each year. About half of these students also had had some degree of academic difficulty in the preclinical years, and this may represent concordant information that identifies the students at the bottom of the class. These students’ performances were consistently below average across clerkships. The other half of the students demonstrated difficulties during their first clerkships.
Remediation when necessary has taken the form of repetition of part or all of a clerkship under
closer supervision by a senior faculty member or in a specialized setting that lends itself to better
observation and guidance. Over the last five years at NYUSoM, only two students have not
graduated as a result of academic difficulties in the clinical years.

**Residency Program Acceptance**

Students over the years have generally matched very well in high-quality training programs of
their specialty choice. Such outstanding matches have been particularly common in the last five
years, with NYU students matching into the top-rated programs (as determined by the ranking of
their affiliated medical schools in *U.S. News and World Report*) with the following percentages:
61% (Class of 2003), 80% (Class of 2004), 67% (Class of 2005), and 79% (Class of 2006).

**Residency Program Director Evaluations**

Review of evaluations of our graduates by the directors of their residency programs shows that
our graduates exceed the performance of their fellow, non-NYU graduates by every measured and
reported criterion – the smallest difference being in the area of “factual knowledge.” Such minor
discrepancy in just one area may not merit further consideration, but their observation will be
considered by the Curriculum Committee as it addresses one of its prime agenda items this year –
a formal, deep assessment of how our medical students learn and how we would like them to
learn in a an era of rapid, pervasive, technological advancement.

**Recommendations**

- The expectations that students take Step I and Step II of the USMLE should be
  strengthened and continually reinforced. The School of Medicine should study
  whether or not to institute a formal policy requiring students to take Step I before
  beginning their third year clerkships and Step II before application for residency.

**Patient Resources and Clinical Settings**

The clinical learning objectives of the School of Medicine are abundantly met by the clinical
settings and patient resources available to its medical students during their clinical years. NYU’s
main teaching hospital for both inpatient and outpatient experiences is Bellevue Hospital Center.
Bellevue, the flagship hospital of the New York City Health and Hospitals Corporation, is
internationally renowned for its clinical excellence, as well as for the diversity of its patients
measured by several criteria, including their race, ethnicity, and the great variety of their
presenting illnesses. Bellevue is the oldest hospital in the United States and, at present, the
largest, single-building hospital in the country. Each of Bellevue’s inpatient floors has adequate
space for the teaching and learning of clinical medicine, with a large conference room and four
smaller seminar rooms per floor. A library, which offers mainly current issues of clinical
journals, supplements the materials available at the main library of the School. A new, five-story,
I.M. Pei-designed, outpatient services facility has greatly enhanced the clinical experience of the
School of Medicine students. The new building will increase the number of annual outpatient
visits, which have exceeded one half million over the last decade and, in 2005, totaled
approximately 550,000. There also are about 65,000 emergency room visits per year, or about
180 individual visits per day. Attesting to the diversity of the emergency department patients is
the fact that on any given month about 80 different languages are spoken by those seeking
emergency medical aid. Bellevue also has a large inpatient population available to School of
Medicine students during their clinical years. A total of 827 beds have an average occupancy rate
of 85%, with a total number of annual admissions of about 27,000 patients, who then have an
average length of stay of seven days.
The university hospital is Tisch Hospital, where the clinical year students also rotate. In quantitative terms, its inpatient resources are similar to those of Bellevue with about 800 beds, an average occupancy rate of 85%, and an average length of stay approaching seven days. There are approximately 30,000 emergency room visits per year. Tisch Hospital has one large conference room and two smaller conference rooms on almost every floor which are available to clinical students and faculty for meetings and discussion of inpatient cases. Adjacent and readily available to the students are the learning and teaching facilities of the medical school itself. The conference and seminar rooms of the Skirball Institute are just a short walk and a quick elevator ride from Tisch Hospital.

Also available to the 3rd Year clerks and to the 4th Year students on electives are the VA Hospital on the NYU campus, as well as North Shore-LIJ on Long Island and Lenox Hill Hospital, forty city blocks from the campus and easily accessible by public transportation. On average, NYU medical students spend 60% of their overall clerkship time at Bellevue, 30% at Tisch and about 10% at affiliated institutions. The patient populations differ at each of these institutions, resulting in an extremely wide array of clinical experiences for the students. Of great value to the students’ appreciation of varied health systems is the presence within one campus of private (Tisch), public (Bellevue) and federal (VA) hospital centers.

In addition to the abundant patient resources and clinical settings there is a wealth of clinical faculty available to teach our students during their clinical years. The cadre of full-time and voluntary clinical faculty of the School is nearly 5,000. The clinical faculty teaches in formal daily attending rounds, special weekly conferences such as Grand Rounds and Journal Club meetings, as well as in specialty rounds, conferences, and in one-on-one preceptor or mentor sessions. Faculty members also teach in formal monthly electives in subspecialty areas and in structured, individual preceptorships with explicit learning goals and objectives. In addition, students avail themselves of the many opportunities for direct learning alongside faculty members through clinical research electives, as well as through less formal, mentored observerships throughout the four years of their training.

Utilization of Information in the Evaluation and Educational Quality Improvement Process

Information about NYU students and graduates is extensively and continually used to evaluate and improve the educational program. Some of this information is described in prior sections of this report, particularly those that address the evidence that institutional educational objectives are being achieved by our students. USMLE and shelf examination subject scores, academic progress, graduation rates, residency program acceptance patterns, and evaluation of our graduates by their residency program directors are regularly and robustly analyzed by the OME. The results of and conclusions derived from these analyses are continuously and systematically shared with the Curriculum Committee, module and clerkship directors, relevant departments chairs and the Dean, and they are used to improve the educational program.

Evaluation Program

Moreover, the School of Medicine uses information from its students and graduates to evaluate and improve the educational program. Over the last six years, the OME has developed and centralized a valid and reproducible evaluation program of both the preclinical basic science modules and the clinical clerkships. Overall satisfaction scores and student evaluation (both quantitative and qualitative) of specific educational and skill generating items for each clerkship are assessed. Comparisons are made between the clerkships and also across sites within
clerkships in a longitudinal fashion over the years. This internal feedback from the School of Medicine students is used to constantly improve the educational program.

**AAMC Graduation Questionnaire (GQ)**

OME also uses the results of the individual school report of the annual AAMC GQ to evaluate and improve the educational program. The AAMC GQ compares our students’ educational program evaluation responses to those of students in the other U.S. medical schools. The statistical validity of the NYU data is particularly notable because over 90% of each of our graduating class fills out the questionnaire, one of the highest percentages of any medical student body in the country. In general, the School of Medicine’s students’ responses are “better” than that of the national cohort responses in any given year. Also, in general, over a three-year intra-School comparison, there has been an improvement in most items and in most clerkships. The OME carefully analyzes the patterns of responses and acts accordingly to improve the educational program; as always, this process involves direct participation of the module and unit faculty, creation of a strategic implementation plan, and presentation to and endorsement of that plan by the Curriculum Committee. Specific examples of how information derived from the AAMC GQ has driven successful curricular change are provided elsewhere in this report.