Executive Summary

Motivated by major changes in medical practice and new evidence in effective medical education practices as well as regulatory bodies like the Liaison Committee for Medical Education, the Geisel School of Medicine at Dartmouth has initiated a full redesign of its curriculum. Key priorities of the redesign are

1. To promote lifelong learning and critical thinking;
2. To integrate clinical and foundational sciences better across the four-year curriculum;
3. To provide enhanced exposure to longitudinal and outpatient training;
4. To give students enhanced opportunities in healthcare discovery, leadership and scholarship; and,
5. To improve student learning in major longitudinal themes such as ethics, humanities, professionalism and practice resilience.

This document describes the first draft of the four-year framework for the new curriculum. A product of the teamwork of over 100 faculty and students on the curriculum redesign working groups, this framework will be discussed in multiple upcoming faculty hall, focus group and departmental meetings. We look forward to hearing from you! Following these discussions, the curriculum redesign proposal will be subject to approval of the Medical Education Committee in May and a full faculty vote in June.

Major innovations in the proposed four-year framework that will be discussed in this document include:

1. Markedly enhanced use of active learning techniques;
2. A four-year, cross-departmental and clinically-relevant curriculum in the biomedical sciences;
3. A four-year core curriculum and elective master’s program in healthcare evaluation and innovation;
4. An enhanced 18+ month longitudinal clinical curriculum paired with complementary mentored small group teaching; and,
5. Intensified coverage of critical longitudinal themes including ethics, humanities, and practice resilience.

If the Medical Education Committee and full faculty approve this framework, the Geisel curriculum redesign will expand to include faculty course directors and their cross-departmental teams. These teams will conduct course, syllabus and session design in 2013-2014, pioneering work that will supported by extensive faculty development and salary support when appropriate. Implementation planning will follow in 2014-2015, meaning the first class of students in the new Geisel curriculum will enroll in the summer of 2015.

We look forward to continued conversation with the faculty and students about this innovative approach to medical education. Our goal is to provide Geisel graduates with enhanced opportunities to provide outstanding clinical care and leadership in medicine for the decades to come.
Introduction

The Geisel School of Medicine at Dartmouth has initiated a full redesign of its medical school curriculum to create a cutting edge curriculum that can serve as a nationwide model for medical education. This huge effort – which to date has involved more than 100 faculty and students in several curriculum redesign working groups – is stimulated by changes in medical practice, new evidence regarding effective medical education, and by the requirements of regulatory bodies like the Liaison Committee for Medical Education.

We will develop an integrated and clinically-driven curriculum that utilizes 21st century educational techniques to prepare medical students to be outstanding physician leaders in a wide variety of medical fields. The new curriculum design will support critical thinking and lifelong learning, provide outstanding and innovative education, prepare graduates to provide both world-class care for patients and effective healthcare leadership for populations. Additionally, the redesigned curriculum is designed to support student moral reasoning, professionalism and practice resilience.

The specific strategies we will employ to accomplish this mission include:

1. Markedly enhanced use of active learning techniques;
2. A four-year, cross-departmental and clinically-relevant curriculum in the biomedical sciences;
3. A four-year core curriculum and elective master’s program in healthcare evaluation and innovation;
4. An enhanced 18+ month longitudinal clinical curriculum paired with topically-aligned mentored small group teaching; and
5. Intensified coverage of critical longitudinal themes including ethics, humanities, professionalism, and practice resilience.

The curriculum redesign will occur in three stages culminating in the summer 2015 enrollment of the first class into the new curriculum. These stages are (1) framework design, (2) syllabus and course design, and (3) implementation. The first stage, framework design, began in July 2012. The work of over 100 faculty and students working on the several working groups of the curriculum redesign led in the ensuing months to the framework draft outlined in this document. In May and June of 2013, respectively, the Geisel Medical Education Committee (MEC) and the full faculty of the medical school will vote on the proposed framework. If the faculty votes for approval, then in 2013-2014 the approved framework will be converted into courses designed by Geisel faculty teams under the centralized oversight of the Medical Education Committee, and we will enroll the first class of medical students into the new curriculum in summer 2015.

This document summarizes the proposed new four-year curriculum framework. Through Town Halls, focus groups and departmental meetings we anticipate improving this framework based on faculty and student input, thus ensuring we create the outstanding and innovative curriculum that is best for Geisel and its students.
Three Phases of the New Curriculum

The proposed new curriculum will take place in three phases, each emphasizing a key transition in medical student training but all three fully integrated with each other.

In Phase I, Introduction to Biomedicine, students will learn the foundational biomedical sciences with clear linkages to early training in clinical medicine and population sciences.

In Phase II, Clinical Immersion, students will undergo intensive inpatient and outpatient training with a strong embedded backbone of foundational biomedical sciences, thus better integrating the foundational biomedical sciences into the clinical years.

In Phase III, Differentiation & Exploration, students will engage in more advanced clinical training wedded to more advanced training in the foundational biomedical sciences. These high-quality, integrated training experiences will be flexible, individualized to support the student’s chosen career path and accompanied by extensive elective time.

The Draft Four-Year Curriculum Framework

The diagram below shows the framework for the proposed curriculum redesign. The ensuing pages provide greater detail about each aspect of the framework.
Active Learning and Critical Thinking

Perhaps the greatest innovation of Phase I of the redesigned curriculum is not the calendar of classes but the entirely reshaped context of student learning. In the new curriculum, consistent with recommendations in the seminal 2010 Carnegie Foundation work *Educating Physicians* by Cooke, Irby and O’Brien, and in adherence with the regulatory requirements of the Liaison Committee for Medical Education, we will expand dramatically the emphasis on evidence-based active learning techniques.

Instead of the current approach in which faculty teach predominantly through lectures, in the redesigned curriculum medical students will learn through interactive case-based exercises that encourage critical thinking and lifelong learning. Learning will be student-centric, interactive, and require a high degree of student autonomy and responsibility. Such case-based and interactive small group sessions will be given context and introduction via interactive large group framing sessions delivered by faculty who coordinate session content with small group cases. There will be integrated laboratory demonstrations and optional just-in-time learning sessions that complement the topics introduced in that week’s case.

For instance, in a routine week diagramed at the right, a student will study clinical endocrinology and cell-to-cell signaling together in the same case of a patient with type 2 diabetes mellitus given a PPAR-γ activator. Into this case will be woven topics pertinent not only to the course block the student is taking that month but also to longitudinal topical themes (more details on themes is [here](#)). For instance, the above patient with type 2 diabetes mellitus can be depicted as a single mother with inadequate insurance coverage to facilitate discussion of healthcare delivery science, and the scenario could also include inadvertent clinician disclosure of sensitive patient information to a family member, thus encouraging student exploration of the ethics of patient confidentiality.

At the beginning of the week in each block of the redesigned curriculum (more details [here](#)), students will dissect each case systematically to identify learning objectives in a small group setting with faculty facilitation. Following faculty delivery of one or two interactive large group sessions on complementary topics such as islet cell dysfunction and endocrine signaling, students will study on their own about the learning objectives identified in those small group sessions. The next day students will study independently, and attend complementary cross-departmental lab session – perhaps about the histology, anatomy, pathology and imaging properties of the pancreas. Students then report back to their mentored small group about the findings of their independent study work, teaching each other with faculty facilitation about key concepts and skills acquired in that study process. To ensure students identify the complete set of learning

<table>
<thead>
<tr>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
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</thead>
<tbody>
<tr>
<td>Small group case-based session for Y1 students</td>
<td>Lab or other similar integrative session</td>
<td>Large group session aligned with small group</td>
<td>Lab or other interactive teaching time</td>
<td>Small group case-based session for Y1 students</td>
</tr>
<tr>
<td>Review, mentorship/ advising, and study time</td>
<td>Clinical Longitudinal Curriculum (CLC) – longitudinal clinic and mentored small group discussion</td>
<td>Review, mentorship/ advising, and study time</td>
<td>Review, mentorship/ advising, and study time</td>
<td>Review, mentorship/ advising, and study time</td>
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<tr>
<td>Healthcare evaluation and innovation</td>
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</tbody>
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objectives embedded in the case, at the end of each week course directors will provide students with a summary of topics and skills on which they will be evaluated.

At the end of each block, faculty will evaluate students via a diverse array of rigorous multi-modality evaluations such as simulated patients, oral exams, online quizzes, essay and multiple choice exams. Both formative and summative evaluations will be the norm in all courses. On average in the Core Biomedical Curriculum, we envision students will spend 2 hours per day in small group discussion, 1 hour in large group sessions, 1.5 hours in interactive cross-departmental labs, and (with the exception of clinic afternoons) at least 4 hours of independent study. This student schedule, which features less time in class than the current curriculum and far less time in lecture settings, will facilitate the transition from teacher-centered to learner-centered medical education at Geisel in part by encouraging student independent study. This also allows rigorous, focused preparation for small group sessions, and in-depth case-based problem-solving in concert with small group collaborators.

For more information on the evidence behind active learning approaches like these, we recommend:


### Cross-departmental Collaboration in the Core Biomedical Curriculum

In Phase I the structure of courses in which students learn foundational biomedical sciences is also entirely re-envisioned. As diagrammed below, the Core Biomedical Curriculum will consist of six cross-departmental courses, each comprised of complementary component topic blocks that can be explored in concert through cases. A clinician/scientist duo will lead each block. This new design encourages clinically relevant, collaborative and integrated study of the concepts, skills, and knowledge our medical students will need to practice effectively in the modern era. The table below depicts the cross-departmental topical content of each course.

<table>
<thead>
<tr>
<th>Course</th>
<th>Blocks</th>
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<tbody>
<tr>
<td>Cellular and Molecular Basis of Disease</td>
<td>Cell biology, genetics, oncogenesis</td>
</tr>
<tr>
<td>Inflammation, Infection, Immunity &amp; Hematology</td>
<td>Immunology/immunopathology, inflammation, microbiology, virology, infectious diseases, hematology</td>
</tr>
<tr>
<td>Homeostasis</td>
<td>Cardiovascular, respiratory, fluids, electrolytes, and nephrology</td>
</tr>
<tr>
<td>Command, Control &amp; Regulation</td>
<td>Endocrinology, brain &amp; behavior, musculoskeletal &amp; connective tissue</td>
</tr>
<tr>
<td>Nourishing the Body</td>
<td>Integrated metabolism, gastroenterology</td>
</tr>
<tr>
<td>Where We Began</td>
<td>Reproduction and development</td>
</tr>
</tbody>
</table>

Each course and each block will differ somewhat in length based on the nature and range of the topics presented. The typical week will include 12-14 hours each week devoted specifically to the core biomedical
curriculum, and will be organized by clinician/scientist duos in close collaboration with a team of clinicians and scientists from the departments appropriate each block’s topics. Block leaders and faculty will use active learning approaches in small and large group settings to present clinically relevant pathophysiological concepts and challenges to encourage critical thinking, lifelong learning, and hypothesis-based clinical problem solving.

The figure below depicts the approximate sequence and duration of the six courses of the new curriculum.

In addition to the six courses described above, the Core Biomedical Curriculum will include longitudinal threads that integrate the six blocks with topics relevant to all cases and fields. Example threads are pharmacology, anatomy, pathology, imaging, embryology, dermatology and 4-6 disease-based threads. Analogous to course blocks, cross-departmental teams will participate in threads as well.

A key to the success of curriculum redesign will be integration between blocks within the courses and longitudinally between courses. This will be encouraged by close and ongoing real-time collaborations of course, block and thread leaders in the presentation and evaluation of material. The first step in this process will be the centralized and deliberate mapping of Geisel’s revised educational competencies to each course and block.

The six blocks of the Core Biomedical Curriculum will be bookended by two critical synthesizing learning experiences: (1) Foundations of Medicine and (2) Putting It Together.

Foundations of Medicine will introduce an entering class of students with diverse backgrounds to the same level of proficiency with the basic concepts and vocabulary needed to thrive in the Core Biomedical Curriculum. In Foundations of Medicine we will introduce students to the case-based, active learning approach that will typify much of their education at Geisel. Further, it will introduce students to basic clinical skills such as checking vital signs and conducting a basic interview, and it will familiarize students with the case-based small group approach to learning medicine. Foundations of Medicine will also be the time when students begin their self-directed, mentored, electronic educational portfolio they will use through the four years of medical school to ensure they are making steady and systematic process toward achieving the competencies needed to graduate on schedule. It is also a wonderful time to commemorate the fact that our students have now entered the profession of a lifetime.
Putting It Together will bring faculty from all six courses to test and advance student achievement of competency in the Core Biomedical Curriculum using interactive small group cases that span topics presented in the six blocks. This 4-week course will solidify concepts learned in the Core Biomedical Curriculum and complement independent student preparation for the boards.

The newly re-envisioned Core Biomedical Curriculum will provide Geisel students with unprecedented opportunities in integrated, cross-departmental learning about foundational biomedical sciences in a fashion that promotes student responsibility, autonomy, critical thinking, and lifelong learning.

**Healthcare Evaluation & Innovation: Core Curriculum and Elective Master’s**

Unprecedented progress in biomedical science combined with tremendous pressures on healthcare have transformed the nature of health and disease and the practice of medicine. This has led to growing challenges in translating research and evidence into practice and fostered disparities in quality of and access to healthcare. Geisel is uniquely positioned to prepare students as leaders with the knowledge, skills, and experience necessary to address these challenges. From the bench to the bedside to the community and beyond, leaders are needed who can think critically, innovate creatively, and work collaboratively to realize evidence-based high quality healthcare in the U.S. and worldwide.

Expertise within the Dartmouth community provides us the opportunity to integrate this content into the core medical school curriculum for all students and to offer selected students the opportunity for intensive study while pursuing a joint MD/MS degree within four years. The integrated MS degree program at Geisel will develop physicians who lead discovery, improvement, and critical evaluation in health and healthcare.

Building on the healthcare delivery science course sequence in the current Geisel curriculum, we will engage all medical students in the new curriculum with approximately 320 hours of coursework over four years as part of the new required Healthcare Evaluation and Innovation (HCE&I) curriculum. Students seeking more intensive preparation may enroll in the HCE&I Master of Science (MS) degree program. This inaugural MS offering will require 360 elective curricular hours over the four years – comparable to requirements of other master’s programs at Dartmouth. The four required courses for the Core HCE&I curriculum and the elective structure are depicted below.

| Comprehensive Longitudinal Leadership Curriculum | 4 credits, ~ 80 hrs per credit over 4 years |
| All Students |  |
| Healthcare Systems: Design & Improvement |  |
| Measurement, Analysis & Critical Appraisal |  |
| Healthcare Financing & Policy |  |
| Electives x 4 | 6 credits, ~ 40 hrs per credit over 4 years |
| Scholarly Project leading to publication / quality improvement |  |
The HCE&I curriculum will be integrated throughout Phases I, II and III of the Geisel curriculum. For example, during Phase I, approximately 50% of HCE&I material will be delivered in the context of small group cases and the other 50% will be provided in complementary independent sessions with explicit linkages to the cases being delivered in that particular block. Students who pursue the integrated MS degree will work closely with a faculty mentor on a scholarly project of their choosing – with content areas that include global health, translational research, medical education, healthcare outcomes and improvement, among others. We have designed the MS curriculum so that in the future, additional research areas can be developed as parallel tracks with a customized core and elective content. Ultimately, the focus of the MS work will be limited only by student curiosity and the availability of a local faculty mentor.

The table below summarizes the number of curriculum hours required for the HCE&I core curriculum and elective master’s program. The latter are consistent with requirements of master’s programs at Dartmouth and other leading institutions.

<table>
<thead>
<tr>
<th>Healthcare Evaluation and Innovation Curriculum Track</th>
<th>Required hours</th>
<th>Hours in existing 4-year Geisel curriculum</th>
<th>Hours in proposed 4-year curriculum</th>
<th>Elective hours in proposed 4-year curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core track for all students</td>
<td>320</td>
<td>135</td>
<td>185 (~0.75/week)</td>
<td>0</td>
</tr>
<tr>
<td>Elective master’s program</td>
<td>360</td>
<td>0</td>
<td>0</td>
<td>360</td>
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The implementation of enhanced core curriculum in HCE&I, as well as an innovative elective master’s program in HCE&I, will provide Geisel students with unprecedented opportunities to understand, improve and thus lead our healthcare system in the coming decades.

**Longitudinal Outpatient Clinical Curriculum**

Most physicians graduating today will practice longitudinal patient care in outpatient settings. To align the Geisel medical school experience with this new reality, the Clinical & Longitudinal Curriculum will intensify medical student longitudinal clinical experience and skills-building in a fashion informed by a major pilot project occurring in 2012-2013 and substantively improved from the existing model in the following ways:

1. **Duration**: Students will have 18 intensive months plus 12 months integration with Clinical Immersion year as allowed by clerkship location and timing, thus spending more than half of their medical school career in longitudinal outpatient setting.

2. **Longitudinal care**: Students will establish high quality longitudinal relationships with a specific outpatient primary care practice in which they will follow a panel of patients with a consistent mentor. In the first 18 months of the four-year curriculum, this will occur three times each month and once each month students will have the option of joining another clinic in a different specialty, such as an internal medicine subspecialty clinic. During Phase II of the redesigned curriculum, students will continue longitudinal care in their home primary care practice when scheduling is compatible with clinical immersion training.

3. **Skills building**: Students will obtain intensive training in basic clinical skills – patient interviewing and physical examination skills – early in medical school as part of the Foundations of Medicine course. This skills building will continue and become more advanced throughout the medical school curriculum.
4. **Integration**: The Clinical & Longitudinal Curriculum will collaborate with course and clerkship directors from other portions of the curriculum to align teaching topic and techniques. For instance, students will focus on the cardiac examination during the Homeostasis Block, and student training in effective patient interview techniques will align with student training in professionalism and medical ethics.

5. **Quality improvement project**. Students will complete a community-based quality improvement project focusing on the needs of that clinic and/or community population. This project will utilize skills in system analysis and change acquired in the Healthcare Evaluation & Innovation course.

6. **Mentorship & advising**. Outpatient small group discussion mentors will provide enhanced longitudinal mentorship in coordination with the Office of Student Affairs.

7. **Improved faculty development**. To facilitate this ambitious and geographically distributed approach to teaching, the leadership of the Clinical & Longitudinal Curriculum and the new Office of Faculty Development are providing faculty development for community preceptors.

The new Clinical & Longitudinal Curriculum will ensure Geisel students have outstanding, longitudinal, and mentored training in outpatient primary care medicine that starts early in medical school and is closely integrated with the core medical school curriculum.

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**Phase II – Clinical Immersion**

**Clinical Immersion Training:**
**Outstanding Clinical Training Paired with Clinically-relevant Science**

In Phase II of the redesigned Geisel curriculum, students will embark on intensive inpatient and outpatient clinical immersion training experiences that build on successful aspects of the present curriculum but with key changes. The clinical immersion clerkships now included in the ~14 month span of Phase II include:

1. Surgery
2. Pediatrics
3. Medicine
4. Geriatrics and Ambulatory Medicine
5. Obstetrics/Gynecology
6. Psychiatry
7. Family Medicine
8. Neurology

Much as in the current curriculum, in these immersion clerkships students will join department-specific healthcare teams in clinics and on the wards in the collaborative provision of one-on-one clinical care.

Newly, these intensive inpatient and outpatient clerkships will now incorporate clinically-relevant sessions in foundational sciences taught by collaborating clinicians and scientists. In recognition of the fact that students travel widely for many specialty rotations currently, we anticipate this program will begin in surgery and
medicine where a greater number of students are in large institutions (Dartmouth-Hitchcock Medical Center and California Pacific Medical Center) where centralized oversight and the availability of scientists collaborators make this curriculum feasible. Case-based exercises, similar to but more sophisticated than those students experience in Phase I of the curriculum, will be the vehicle for the majority of this integration. We will also use innovative online modalities to augment the existing in-person training experiences.

To build on the outpatient training obtained in the first two years of the Clinical & Longitudinal Curriculum, students participating in clinical immersion training in the Upper Valley will continue to work in the site of their longitudinal clinics as feasible within the structure of redesigned clinical immersion clerkships. In 2013-2014, leaders of the Clinical & Longitudinal Curriculum will coordinate closely with leaders of clerkships with a strong outpatient emphasis such as Family Medicine; Geriatrics & Ambulatory Medicine; and Pediatrics to identify opportunities for coordinated longitudinal clinics. The exact depth and nature of the integration between the Clinical & Longitudinal Curriculum with these clerkships will be shaped in 2013-2014.

The clinical immersion year will begin with a multidisciplinary Clinical Skills Interseession that will prepare students for life as full-time clinicians. Skills acquired in this ~2 week intersession will include advanced communications and physical examination skills, phlebotomy and intravenous line placement, basic life support and other clinical skills that will prepare them for the clinical immersion experiences of Phase II.

Thus, in the redesigned curriculum Geisel students will continue to benefit from immersion in outpatient and inpatient departmental clinical practices, but these experiences will be better integrated with foundational sciences and longitudinal outpatient training and begun with improved training in basic clinical skills.

### Phase III – Differentiation & Exploration

**Progressive Preparation for Future Physician Careers**

In recognition of the wide diversity of Geisel graduate career choices, and the different skills needed for these different career paths, the new Geisel curriculum is designed to promote a progressively more individualized experience that aligns well with student career choices.

Phase III will begin in 2018 and thus the design of this Phase of the curriculum is still underway. Importantly, redesign leadership wants to leave sufficient flexibility in the early conception of Phase III to accommodate and integrate with features of Phases I & II that emerge with the 2013-2014 phase of curriculum redesign. Despite this appropriate flexibility of design, key characteristics have consensus support.

To ensure students are ready for this transition, Phase III begins with a clinical Skills Evaluation Intersession. To ensure students obtain needed clinical competency in Phase II prior to engaging with the advanced training of Phase III, students will undergo approximately two weeks of evaluation of their communication, examination and other clinical skills using Observed Standardized Clinical Experiences (OSCE) in the simulation center. The recognition and analysis of ethical issues too will be embedded in these OSCE’s. During this
intersession, students will receive intensified career counseling and orientation to the residency application process.

Early in Phase III, all students will take required Sub-Internships in a field of their choice, as they do now. These are excellent opportunities for students to obtain increasing clinical autonomy and mentored acquisition of advanced clinical skills training in preparation for internship.

A new addition to Phase III will be the creation of a new Integrated Acute Care Course. In the Integrated Acute Care Course, students will manage emergently and critically ill medical and surgical patients under the supervision of Dartmouth-Hitchcock faculty who will partner with Geisel faculty scientists to embed advanced case-based and clinically-relevant lessons in the foundational science behind modern management of urgently ill patients. This will ensure all Geisel graduates are familiar with the management of complex and moribund patients, a deeper experience of the procedural skills that help establish clinical competency during internship, and a sophisticated understanding of the scientific underpinnings of modern medicine. Examples of teaching newly possible in this context are the attending-supervised bedside use of vasopressors in a septic patient followed immediately by scientist review of alpha- and beta-agonist mechanisms, or cutting edge review of ventilator management fast on the heels of titration of positive end-expiratory pressure in a critically hypoxic patient.

The required Geisel curriculum will continue to include a Capstone Course incorporating elements of the existing capstone courses Health, Society & the Physician; Clinical Pharmacology & Therapeutics; and Advanced Medical Sciences. This content will be modified in response to changes in the preceding curriculum such as will be clarified in the 2013-2014 course and syllabus design period. Despite this appropriate flexibility, we will maintain in this Capstone Course a strong emphasis on: (1) the assimilation of clinical skills including in clinical pharmacology, (2) the engagement in individualized scholarly projects in quality improvement, and (3) time to reflect on physician role in society and professionalism. Newly, students will complete and present the results of required scholarly projects begun early in the curriculum and finished using skills obtained in the Healthcare Evaluation & Innovation course. While all students will complete scholarly projects, students electing to participate in the master’s program will have more intensive requirements of scholarly achievement.

In recognition of the increasing differentiation of Geisel graduates into a wide array of possible career tracks, several months of Phase III of the redesigned curriculum will remain available for elective time that will allow exploration of possible career tracks, travel to alternate sites, and pursuit of scholarly activities.

Four-Year Themes in Ethics & Humanities, and Practice Resilience

Training in the compassionate, humane and ethical care of one patient at a time is central to the delivery of outstanding medical care. This requires not only effective communication skills but also a strong drive to serve humankind and an enjoyment of the personal side of medicine. To support these critical components of medical education in compliance with LCME mandates, we have designed the Theme in Ethics & Humanities and the Theme in Practice Resilience. Both will run across the full four-year curriculum.

The Ethics & Humanities Theme will average 200 hours over the four-year curriculum. This Theme will align with critical transitions in student professional formation, including: (1) introduction to professionalism in Foundations of Medicine, (2) basic recognition and analysis of seminal ethical issues in the Core Biomedical Curriculum, (3) processing of the stresses patients and physicians via narrative writing in the Clinical & Longitudinal Curriculum, (4) discussion of and engagement with ethical obligations to society in the formulation of community projects as part of the Healthcare Evaluation & Innovation course, and (5) ethically-informed career planning in the Capstone Course. Students will also be offered a wide
range of ethics and humanities electives, many in an inter-professional environment to foster a greater in-depth understanding of specific areas focus contributing to professional growth and leadership.

The Practice Resilience Theme, that will average 34 hours over the course of the four-year curriculum, will engage students in evidence-based skills-building sessions around practice resilience. These sessions, many built into Foundations of Medicine and interwoven into physiology-based sessions in the Core Biomedical Curriculum, will address the physiological underpinning of stress in patients, and how these responses can be modulated, since such lessons have been shown to improve student skills in self-care and practice resilience. The Practice Resilience Theme will be closely aligned with student mentorship programs.

Healthy Impact on Student Life

It is critically important to the faculty and student leadership of the curriculum redesign that the new curriculum will be structured and implemented in a way that promotes practice resilience and healthy work-life balance. Relevant characteristics of the proposed new curriculum that address these aims include:

1. Emphasis on student-centered active learning approaches that engage student curiosity, autonomy and lifelong learning.
2. Ample opportunities for individualized student progression through the curriculum so students can align outstanding training with future career goals.
3. Incorporation into the four-year framework of multiple time points in which the whole class convenes together for shared learning and class cohesiveness, such as in the Clinical Skills Intersession, the Skills Evaluation Intersession, and the Capstone Course.
4. Attention to incorporation of student vacations in the first and second summers of medical school to allow for student rejuvenation and participation in domestic and global health internships.
5. Enhanced longitudinal mentorship embedded in multiple small group settings and well-coordinated with existing centralized mentorship resources.

Summary

The Geisel curriculum redesign builds on the extensive existing strengths of the Geisel School of Medicine at Dartmouth in order to bring medical education to a new and standard-setting level. Foundational biomedical concepts and critical thinking will be part of the four-year curriculum including in clinical immersion didactics and a new Integrated ICU. Clinical training will be not only intensive, but also longitudinal and situated in the communities in which our patients live. Student scholarship and leadership will be supported by skills building in healthcare evaluation and innovation available uniquely at Geisel. Student professionalism, ethical reasoning and practice resilience are more strongly emphasized and centrally coordinated through four-year themes that span the curriculum. Throughout, Geisel faculty and students will engage in evidence-based active learning approaches that ensure student learning is optimized and cutting edge. In so doing the new Geisel curriculum will provide its students with innovative training in outstanding clinical care, critical thinking, leadership, scholarship and compassion.
Frequently Asked Questions

1. *How does the proposed framework address major goals of the curriculum redesign?* Please see the table below.

<table>
<thead>
<tr>
<th>Major goals of the curriculum redesign</th>
<th>How these goals are addressed in the proposed four-year framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>To promote active learning, critical thinking and lifelong learning skills</td>
<td>Enhanced use of active learning including case-based small group learning</td>
</tr>
<tr>
<td>To enhance integration of clinical &amp; basic sciences</td>
<td>The four-year core biomedical curriculum is incorporated into clinical rotations and each cross-departmental block will be co-led by clinician and scientist teams.</td>
</tr>
<tr>
<td>To engage students in outstanding longitudinal clinical training</td>
<td>Intensified and longer duration outpatient training in a with mentorship</td>
</tr>
<tr>
<td>To provide novel training to be scholars and leaders in healthcare evaluation and innovation</td>
<td>Enhanced core curriculum and novel elective master’s program in healthcare evaluation and innovation</td>
</tr>
<tr>
<td>To improve integration of ethics, humanities, professionalism, mentorship, and practice resilience into the curriculum</td>
<td>Themes in ethics &amp; humanities and practice resilience. Mentorship embedded in small group settings.</td>
</tr>
<tr>
<td>To improve individualization of the curriculum to student interests and career needs</td>
<td>Student-centric use of active learning approaches in the Core Biomedical Curriculum; enhanced core curriculum and a new elective master’s program in Healthcare Evaluation &amp; Innovation, both of which involve a student-elected scholarly project; and a ten-month Phase III focusing on student Differentiation &amp; Exploration.</td>
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2. *Is this innovative enough?* Yes. In multiple ways summarized above the redesigned curriculum is substantively improved on the current excellent curriculum in ways that will directly improve student preparation for a fulfilling career in modern medicine.

3. *Clinicians have increased RVU pressures and scientists have lower funding paylines – how will we have time to teach in the redesigned curriculum?* For all academic medical school faculty members, teaching is both a joy and an expectation. Fortunately, in a testament to Geisel faculty’s longstanding commitment to outstanding medical education, faculty involvement in teaching remains strong despite these intensified external pressures. Dedication to teaching that goes above the baseline expectation will be funded by the Office of Medical Education. Examples of funded types of teaching include required course and clerkship leadership, intensive longitudinal small group facilitation and clinic precepting, and other major contributions.

4. *Will there be enough rooms for the new emphasis on small group teaching?* The redesigned curriculum will engage students and promote substantially more small group interactive teaching. The curriculum redesign leadership has already begun planning to make sure we have enough rooms for this evidence-based but space-consuming teaching modality by partnering with library and building management, including playing a role in design of new construction. Through renovations to the Remsen building, there are now 8 rooms available for 10-15 students each, and additional rooms for small group interactions will be available through the new North Campus Academic Center at Dartmouth.

5. *How will you evaluate the success of the redesigned curriculum?* Geisel already tracks key measures of student and graduate success which we will follow very closely in transition to the redesigned curriculum. Examples include student board scores, student performance on OSCE examinations, student acceptance into high quality residency programs, student satisfaction, and the prevalence of depression in students. We will also measure adherence to LCME guidelines regarding use of evidence-based active learning approaches. We recognize however that these existing metrics fall
short of assessing the true success of a medical school curriculum, and thus our Medical Education and Learning Design group has already begun the formulation of novel clinical performance and student satisfaction metrics to follow before and after the curriculum redesign. In so doing we will more fully measure the success of this curriculum innovation, and help lead national assessment of medical education.

6. **Is there centralized oversight of the curriculum redesign process?** Yes. The curriculum redesign process is charged by the Dean and under the direct supervision of the Office of Medical Education. Senior Associate Dean for Medical Education Rich Simons, MD, appointed the curriculum redesign leadership and is actively involved in the design process. The four-year framework model outlined in this document, and the more-detailed course objectives and syllabi to be completed in spring of 2014, will be discussed and voted on by the Medical Education Committee as mandated by faculty by-laws and the LCME.

7. **Can a substantive master’s program really be accomplished in the same four years students satisfy MD requirements?** Yes. The proposed elective master’s degree requires students to complete a number of credit hours commensurate with other master’s degree programs at Geisel and elsewhere. These credit hours can be completed in four years by students in the MD program via a combination of participation in the redesigned core curriculum (which includes enhanced healthcare evaluation and innovation coverage) and via use of elective time over the four-year curriculum. Students who elect to complete the combined master’s degree and MD will still be allowed to complete degree requirements in more than four years, but this will not be required.

8. **I’m excited about the innovative use of active learning approaches in the redesigned curriculum, but some of these techniques are new to me – will Geisel help faculty make this transition?** Yes. One of the major enhanced investments Geisel has made in the Office of Medical Education is in the creation of a new Office of Faculty Development led by Dr. Leslie Fall, the new Associate Dean of Faculty Development. Dr. Fall and her crack team of expert medical educators have already begun holding seminars and intensive learning conferences on multiple aspects of teaching including active learning approaches, and these efforts will intensify and expand as the curriculum redesign continues.

9. **With the integrated MS degree, what will happen to our current joint degrees such as the MD/PhD, MD/MPH at TDI, MD/MS at Thayer, or the MD/MBA at Tuck?** Each of these programs will continue to be available for students. The new MD/MS degree will create an option for more students to pursue scholarly activities by achieving dual degrees within four years. No changes are planned for the MD/PhD program.
We Want Your Feedback and Your Ideas

The curriculum redesign team is excited to further refine this four-year framework for the new Geisel curriculum in collaboration with faculty members and students. Therefore, we invite you to attend Curriculum Redesign town halls and focus groups, to attend departmental meetings scheduled by our communications team, and to give us feedback in person or by email at Geisel.curriculum.comments@dartmouth.edu.

Respectfully submitted,
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On behalf of the more than 100 faculty and students members of the curriculum redesign working groups
Definitions

Active Learning. Instruction that engages learner participation as a means of enhancing retention and understanding. Examples of approaches to active learning can be found here. Frequently contrasted with more passive approaches to learning such as listening to a lecture.

Block. A specific topic area within a course. For instance, the proposed Command, Control & Regulation course contains the following topical blocks: endocrinology, brain & behavior, musculoskeletal & connective tissues.

Course. An interdepartmental course lasting 4-8 weeks in the Core Biomedical Curriculum and consisting of complementary topical blocks. An example is the Homeostasis course which includes integrated training cardiovascular, renal and respiratory sciences.

Phase. One of three major parts of the four-year curriculum. An example is the first portion of the curriculum, Phase I, that incorporates Foundations of Medicine, the Core Biomedical Curriculum and the Clinical & Longitudinal Curriculum as well as the Healthcare Evaluation and Innovation program.

Theme. A four-year longitudinal topic integrated into multiple aspects of the curriculum. An example is the Theme in Ethics & Humanities.

Thread. A longitudinal topic such as anatomy or pharmacology that will be championed by clinician/scientist teams in collaboration with course and block leaders in the Core Biomedical Curriculum.

For More Information

For more information on our vision, mission, values and goals, see:
http://geiselmed.dartmouth.edu/insider/curriculum-redesign/philosophyandobjectives/

For more information about the current Geisel curriculum, see
http://geiselmed.dartmouth.edu/ed_programs/mdprog/