C-1

DESIGN AND IMPLEMENTATION OF AN INTEGRATED MEDICAL SCHOOL GENETICS CURRICULUM: FIRST REPORT

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The explosion of genetics information and its impact on medicine is common knowledge, with medical leaders exhorting medical schools to prepare students for a practice environment their teachers are just beginning to experience. Like many schools, we have a full curriculum, with other important curricular themes competing for teaching time, and limited faculty with expertise in modern genetics. Our goal is not only to provide medical students with knowledge of molecular genetics and its application to medicine, but also to develop and assess their ability to update their knowledge and apply it to patient care. A task force consisting of basic scientists and clinicians with backgrounds in molecular biology or genetics and 3 genetics counselors was charged to prepare a design and implementation plan. Our overall design was to: develop a genetics core within the existing cell biology course; identify appropriate genetics content for each subsequent course and clerkship; require students to shadow a genetics counselor 1-2 days during their third year; develop a one-day 3rd-year symposium/workshop including a genetics review, report latest findings, case-based discussion of genetic counseling, interaction with patients and family affected by a genetic disorder; and develop an outcomes-based 4th year genetics elective course. We used the ASHG and NCHPEG recommendations to map existing content to courses and identify concepts currently taught/not taught. We identified a set of core genetic disorders, integrating basic genetics concepts, pathophysiology, and therapeutic approaches, for use throughout the curriculum. When first encountered, the clinical case contains a brief history/pedigree, inheritance pattern, gene, and molecular basis. Each subsequent use of the disorder builds on the previous case, adding clinical and laboratory data to support course-specific learning goals. A Genetics Portfolio framework was developed to integrate learning in a concrete way. Students are responsible for collecting relevant information from courses, projects, and independent study in the notebook as their knowledge of genetics develops. Members of the task force will review each notebook annually, giving students feedback on their progress and serving as *de facto* course directors for a longitudinal “course-without-walls”. To implement the design plan, we met with each course/clerkship director to discuss recommendations for their course and agree on short-term and long-term implementation goals. Course directors agreed to use the genetics text for assigned readings, relevant core genetics disorders when teaching course-specific concepts, and refer students to the genetics portfolio for past learning and to store new learning. The genetics core and 3rd year symposium/workshop have been successfully implemented. Other elements will be implemented in year 03/04.

C-2

INTEGRATING MEDICAL IMAGING TECHNOLOGY IN PRACTICAL SESSIONS OF HUMAN GROSS ANATOMY FOR UNDERGRADUATE MEDICAL STUDENTS

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The need to increase the efficiency of gross anatomy teaching in the dissecting room has been the driving force behind changes implemented in a renewed integrated system-based medical curriculum with an important reduction of practical teaching hours. In a module of the reproductive system designed for third-year medical students, we organized at the end of a two week schedule of ex cathedra lectures, a practical session in which small groups of students started to study anatomical and embryological models of the reproductive system, followed by active self-learning of prosected male and female preparations of the perineum and pelvis minor. Subsequently living anatomy was presented in a video sequence of a large number of consecutive NMR images of the studied regions. Importantly, these images were commented by a clinician and not by an anatomist. Compared to time-consuming dissections of the concerned regions without link to medical imaging as organized in the old curriculum, students were more motivated to study the prosected cadavers. The simultaneous supply of medical imaging reveals the immediate relevance and need to study 3-D gross anatomy in the dissecting room.

C-3	**THE BEAUTY AND THE BEAST: THE REFORMCURRICULUM DIPOL® AND THE GERMAN FEDERAL LAW ÄAPPO** ***Peter E. Dieter*****, *Dean of Medical Education, Faculty of Medicine and Carl Gustav Carus, TU Dresden, Fetscherstrasse 74, D-01307 Dresden, GERMANY* Medical education in Germany is (strictly) regulated by the federal law –ÄAppO-. A new amendment of this law has been passed recently which will be valid in winter semester 2003. The amendment offers more sovereignty to the medical schools, favours more interdisciplinary teaching and patient-oriented learning, but commits the medical schools to carry out many (~50) examinations. The students have to pass all examination to take part in the national board examinations. The medical school Dresden changed its curriculum from a teacher and discipline-centered to a student and interdisciplinary-centered teaching and learning. The new reform-curriculum DIPOL® (Dresden Integrative Problem-Oriented Learning) in Dresden is based on the principle of „Problem-Based Learning (PBL)“ and has been developed in collaboration with the Harvard Medical School. DIPOL® is a hybrid-curriculum, consisting of tutorials, lectures, seminars, experimental courses and bedside teaching. DIPOL® is implemented in all six years of the curriculum and is valid for all students. The DIPOL® curriculum is divided into modules, interdisciplinary PBL- and clinical block- courses. All teachers are professionally trained in specific PBL-didactic courses. Every aspect of the reform-curriculum is evaluated by an external institution. The new reform curriculum DIPOL® (“Beauty”) will be presented and the advantages and disadvantages of the new amendment of the federal law ÄAppO (“Beast”) will be discussed.
C-4	**INTEGRATING BASIC AND CLINICAL SCIENCES VIA TYPE 2 DIABETES MELLITUS** ***Linda Gunzburger, Ph.D.****, *University of Chicago at IL, Chicago, Illinois 60612 U.S.A., Neena Natt, M.D., Mayo Clinic, Rochester, MN 55905 U.S.A.* According to the American Association of Medical Colleges’ Curriculum Management and Information Tool (CurrMIT) database, fifty-eight (58) medical schools report the teaching of diabetes at some point during the Basic Sciences or Clinical years. Although some have integrated Basic Sciences and Clinical materials, there is a deficiency on how schools view Scientific Evidence Based Medicine content for Type 2 Diabetes Mellitus. Five important key scientific drivers are: **Driver One** – Reducing blood glucose levels and HbA_{1c} levels reduces the risk of diabetic complications. Intensive therapy has been shown to be superior to conventional therapy in terms of reducing glycemia and diabetic complications. **Driver Two –** When monotherapy with an oral agent is no longer adequate, combination therapy with 2 or more oral agents has been shown to significantly improve glycemic control. **Driver Three** – When oral monotherapy or combination oral therapy is no longer adequate, insulin can be added to the regimen to significantly improve glycemic control. **Driver Four** – Benefits of insulin therapy, such as improved outcomes and glycemic control, outweigh risks such as the potential for inducing hypoglycemia. **Driver Five –** Type 2 Diabetes Mellitus is a disease consisting of two components insulin resistance and insulin deficiency. We advocate Diabetes Mellitus be an integrating topic for Basic Sciences courses and the drivers be covered during years 1 and 2. Examples of successfully doing so may be found in the CurrMIT database. We will be preparing a project and ask each attendee their ideas for their schools or a national initiative.

C-5	**ENHANCING THE INSIGHTS OF MEDICAL SCIENCE TEACHERS ON THE INTEGRATION AND APPLICATION OF BASIC SCIENCE KNOWLEDGE IN THE CLINICAL CONTEXT** ***Matthew C.E. Gwee, Ph.D., M.H.P.Ed.*,*** *Dow-Rhoon Koh, M.R.C.P.(U.K)., Ph.D., and Chay-Hoon Tan, M.Med., Ph.D. Departments of Pharmacology and Physiology and Medical Education Unit, Faculty of Medicine, National University of Singapore, 10 Medical Drive, Singapore 11 7597, SINGAPORE* A key feature of 'traditional' medical education is the highly discipline-specific curriculum based on the Flexnerian system that teaching of the basic sciences as discrete and separate disciplines must precede and lay the foundation for subsequent study in the clinical sciences. This created the distinct pre-clinical/clinical divide with little integration of the overall course curriculum. The design and delivery of such a curriculum seem more appropriate for the education of 'mini multidisciplinary-specialists'. A major criticism of this approach is that it promotes highly compartmentalized and discipline-specific learning and, as a consequence, students often lack the ability to integrate and apply basic science knowledge in the clinical context. Our medical school implemented a hybrid problem-based learning (PBL) curriculum in 1999 as an integral component of our overall curriculum reform. An important tenet of PBL is the integration of basic science knowledge with that of the clinical sciences in the context of disease processes and the care of the whole patient. Some key strategies which we use to enhance the integration process include: designing and writing of the problem case by a clinician and a basic science teacher; convening a special meeting of case writers with PBL tutors from the various disciplines to critically review the problem case together; a case writer (as the expert) conducting an interactive session 3 with the entire class of students and PBL tutors to review the main learning issues and the approach used to resolve the problem. Basic science teachers are therefore given the opportunity to seek clarification, especially regarding the clinical aspects of the case, and also to provide cross-disciplinary inputs through sharing of their respective discipline expertise that is relevant to the case. In our experience, such cross-talk and meeting of minds create a conducive educational forum for basic medical science teachers to not only set common educational goals for their students, but also to enhance their own understanding and insights of the clinical relevance of and, therefore, broaden their educational perspectives beyond their own disciplines. This poster will elaborate on how PBL has facilitated the integration of the basic and clinical sciences in the undergraduate medical curriculum of the National University of Singapore.
C-6	**EXPANSION OF MEDICAL NUTRITION TEACHING IN YEAR 1 OF A PROBLEM-BASED LEARNING TRACK THROUGH TRADITIONAL AND COMPUTER-BASED MODALITIES** ***Denise Ferrier, Ph.D.**** *and John B. Swaney, PhD., Department of Biochemistry, Drexel University College of Medicine, Philadelphia, PA 19129 U.S.A.* Drexel University College of Medicine offers two separate curricular tracks for first- and second-year medical students. One, the Interdisciplinary Foundations of Medicine (IFM), is a lecture-based curriculum in which student learning is supported by a variety of small-group activities. The other, the Program for Integrated Learning (PIL), is a problem-based curriculum in which mastery of learning issues generated by individual small groups is supported by large-group resource sessions. In the IFM track, Nutrition is taught as a 16-hour course that includes self-study, lectures, and CD-ROM exercises. In the PIL track, Nutrition has not been a separate course; however, Nutrition-specific learning objectives for Year 1 are supported by suggested readings, focus questions, and limited faculty contact (2.5 hours) in resource sessions. These contact hours are incorporated into Biochemistry, which, along with Microbiology and Immunology, is a focus science for the Block. In 2002, movement of the Microbiology cases to Year 2 presented an opportunity to increase student exposure to Nutrition, a discipline of increasing importance to physicians. To this end, additional learning objectives for Nutrition were incorporated into each of the six current Biochemistry cases. The added objectives were selected from the IFM course based on their relevance to the chief complaint of the PIL cases. Some examples are: 1) the principles underlying dietary recommendations, 2) nutritional considerations for the elderly, and 3) the function of B vitamins and the consequences of their deficiencies in a case of ethylene glycol poisoning in an elderly male alcoholic. Additional Nutrition education will be available within the context of a cancer case that is part of the Immunology of the Block. Mastery of the objectives is being supported through a combination of Web-based modules developed at this institution ("Netrition"), faculty-based resource sessions, and CD-ROM exercises ("Nutrition in Medicine", University of North Carolina), with a total of 7.5 hours of formal exposure to Nutrition. Resource sessions include time for Q&A on the computer-aided instruction in addition to lecture-type presentations. The diversity of learning styles within the student population suggests that this mix of teaching modalities will better meet student needs. Mastery of the objectives will be evaluated through MCQs, short answer, and essay-type questions. Future goals include the addition to Year 2 cases of nutritional considerations for the critically ill patient.

C-7

INTEGRATING IMAGING INTO A MODIFIED SYSTEMS-BASED CURRICULUM USING COMPUTER TECHNOLOGY: WEB COURSE TOOLS AND INTERACTIVE CD-ROM

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The curriculum at the Auburn University College of Veterinary Medicine changed from a discipline based approach to a modified systems based approach four years ago. Basic science classes including Diagnostic Imaging are taught in the first 1-½ years of the Veterinary Medicine curriculum. Diagnostic Imaging is taught by members of the Radiology Section of Clinical Sciences during the second semester of the first year. Instruction begins with physics of diagnostic radiology and moves into radiology and ultrasonography of the thorax, musculoskeletal system, and abdomen. Normal radiographic/ ultrasonographic anatomy is discussed along with selected examples of disease. In the second and third years, students are introduced to the study of veterinary medicine organized by systems. Systems classes that involve the Radiology Section include the hemolymph/integumentary, urinary, musculoskeletal, respiratory, cardiovascular, reproductive and gastrointestinal systems. An interactive CD-ROM is given to students in the first year illustrating basic principles of radiology and ultrasonography. Programs are also available in a 50-station computer laboratory. Information on imaging of pathology is added as students progress through the various systems. Second and third year students may also participate in an elective ultrasonography class. Students are divided into three groups of 7-8 students. Each group meets for a one-hour ultrasound laboratory to enable students to learn via hands-on scanning. In place of a weekly traditional classroom discussion, the class "meets" online using a forum created with Web Course Tools (WebCT) software. Lessons and examinations are also available on the class website. In the final (clinical year), students rotate through a required Radiology block and may choose an elective Ultrasound block. Students evaluate all classes at various stages throughout the curriculum. The majority of students use the CD-ROM and their response has been highly favorable. Some students have requested revised versions after graduation. Response to WebCT has also been very positive with almost all preferring the online format to a formal classroom discussion. The use of CD-ROM technology appears to help integrate imaging into the curriculum throughout all four years.

C-8

DESIGNING INTRODUCTORY MODULE FOR PROBLEM-BASED LEARNING CURRICULUM: AKU EXPERIENCE

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With its inception in 1983 the Aga Khan University Medical College followed an integrated approach for teaching Basic Sciences in the first two years of a five-year undergraduate curriculum. Keeping pace with the global changes occurring in teaching and learning strategies, in 1999 it was suggested that the content of the curriculum should be based on the objectives derived from the AKU list of common clinical presentations. A variety of learning strategies should be used with Problem-Based Learning as the main instructional strategy and the program should begin with a well planned "Introductory Module". There is evidence that PBL curriculum increases student satisfaction with teaching and development of appropriate learning skills (Bligh et. al., Med. Edu., 34: 487-489, 2000). PBL targets self learning skills, structuring knowledge in clinical context and clinical reasoning (Thomas, Med. Edu. 31:320-329, 1997). In April 2000, a Task Force for Curricular Renewal was formed to plan, design and implement the new curriculum. Various module committees were formed. Each of these committees were charged to make "clinical scenarios" with triggers to cover Anatomy, Biochemistry, Physiology, Microbiology, Pathology and Community Health Sciences learning objectives. The Introductory Module Committee addressed two main objectives: (i) to ensure that students are introduced to the PBL strategy (ii) to address the main theme, 'The Cell' without digressing from the PBL strategy. The contents of the Cell Biology course were prepared. These contents were then categorized as core objectives. Main goals were set to design problems to cover the Plasma Membrane, Membrane Transport, Cell Division, Nucleic Acids, Principals of Immunity, Cellular Energy, Relationship between Bacteria and Multi-cellular organisms, Antibiotics and Cell Necrosis. Committee members prepared "clinical scenarios" on these topics based on the AKU list of presentations. Eight problems were designed which revolved around Diabetes Mellitus, Hereditary Spherocytosis, Down's Syndrome, Muscular Hypertrophy in Athletes, Rubella, Exercise, Cellulites and Tuberculosis. In October 2002, AKU Medical College made a switch to PBL curriculum. At this stage first batch, comprising of 88 students is undergoing instructions. Our data show over 85% congruence in the expected LO's and LO's derived by the students in various cases of the Introductory Module. These results suggest that the Introductory Module Committee was successful in designing clinical scenarios based on appropriate LO's and effective triggers. Furthermore, AKU medical students are adapting well to the PBL curriculum.

C-10	**HOW CAN MEDICAL GENETICS AND PATHOGENETICS BE MORE EFFECTIVELY COMMUNICATED WITHIN A PROBLEM-BASED CURRICULUM?** ***Kirsten Larson, Ph.D.****, *Donna Russo, Ph.D., Denise Ferrier, Ph.D., Mary Ann Kuzma-Thompson, M.D., Gail Rudnitsky, M.D., Charles Puglia, Ph.D., Departments of Microbiology and Immunology, Biochemistry, Medicine, Emergency Medicine, and Pharmacology, Drexel University College of Medicine, Philadelphia, PA 19129 U.S.A.* Genetics is one of the most rapidly advancing fields in medicine. Applying these changes to medical school education is challenging because of its interdisciplinary nature, the complexity of providing the content in a realistic clinical context, and the need to educate faculty about recent advances that are often not related to their specialties. Our goal is to provide students with a “genetics lens” so that they view medicine within a pathogenetic context instead of simply the inheritance pattern of a disease. Problem-based learning (PBL) curriculum at Drexel University was established in 1992. Few genetics-related learning objectives were written reflecting the emphasis of medical education at that time. Over the past few years, students in this curriculum have requested additional formal exposure to genetics. Data from NBME shelf exams indicate we could improve the performance of our students on genetics related topics. To this end, we reviewed the PBL curriculum and found existing cases that could be used to teach many of the key principles of human genetics. In previous years, discussion of genetics learning issues appeared to be cursory and variable. Selected cases were modified to strengthen their genetics components, and, faculty prompts and learning objectives were written for each case. The students were examined on this material. In addition, three new cases were created to highlight many of the basic science, clinical, and behavioral objectives of the discipline. These cases were incorporated in a block of the curriculum focusing on biochemistry, nutrition, immunology, and genetics. In order to accommodate the new cases, much of the microbiology taught in the block was moved to year 2 and integrated with pathology, pharmacology, and pathophysiology. Following implementation of these changes, students were evaluated for their genetics knowledge and the perceived usefulness of the new genetics curriculum. The facilitators were also polled to try to assess the types of support needed to assist the increased integration of genetics content into the PBL curriculum. We will report how these measures successfully encouraged students to start to view disease within a genetics context.
C-11	**THE INTEGRATION OF PROFESSIONAL DEVELOPMENT AND MEDICAL SCIENCE LEARNING, A PROGRAM IN LEADERSHIP SKILLS FOR MEDICAL STUDENTS** ***Diane Magrane, M.D.*,*** *Yvette Pigeon, Ed.D., Leah Burke, M.D., Jean Szilva, M.D., The University of Vermont College of Medicine, Burlington, VT 05405 U.S.A.* With the implementation of the Vermont Integrated Curriculum in August 2003, all first year students will enroll in block instruction that integrates fundamental concepts of science, social contexts of healthcare, and clinical skills of physical examination and history-taking. Collaborative learning groups of eight students and one faculty facilitator will meet weekly to discuss and practice skills enabling professional development. These skills include group dynamics and decision-making, conflict management, reflection and planning for achievement, and inquiry based project development. Lessons developed for these Leadership groups integrate and reinforce lessons of each of the courses in a carefully designed curriculum. This poster demonstrates the mutual reinforcement of lessons in the medical sciences and professional development through descriptions of curriculum construction and sample lesson plans.

C-12	**DEFINING AND INCORPORATING CURRICULAR COMPETENCIES INTO A BASIC SCIENCE PBL COURSE AT MONTERREY TEC SCHOOL OF MEDICINE** ***Leticia Elizondo Montemayor, M.D.,*** *Basic Medical Sciences Department, Monterrey Tec School of Medicine, Monterrey Nuevo León, MEXICO* During the curriculum revision process at Monterrey Tec School of Medicine, our school, according to our mission, student profile by graduation time and the National Health Policies and context, adapted the 12-outcome model from Dundee University. Eleven curricular outcomes were identified by collaborative work of 30 teachers and directors. They also defined as a series of components for each outcome and the “observable actions” for each component of each outcome. In an outcome-based education, the outcomes agreed for the curriculum, should guide the courses included in each phase of the curriculum, the content in each course, the teaching methods and strategies to be adopted and what must be assessed. The outcomes that have been defined in our new curricular model, hence, guided what must be taught and what must be assessed in the Human Ecology course, a PBL basic medical science course taken by fourth year students. The “design down” process suggested by Harden was followed in selecting the outcomes, their components and observable actions of each, that were to be developed by students taking the Human Ecology course, considering the recommendations made by the competency groups and by the discipline groups, and according to the course specific *aims* and *particular objectives.* The outcomes of the curriculum were thus, “landed” or incorporated into the course, linked to course aims and particular objectives. A detailed description of the outcomes, their components and observable actions for the course will be presented.
C-13	**CASE-BASED TEACHING IN NEURO SCIENCE ADDRESSES FACULTY EXPECTATIONS FOR COLLABORATION AND STUDENT NEEDS FOR PROBLEM-SOLVING/CLINICAL REASONING SKILLS** ***Z.H.Elza Mylona, Ph.D.****, *Judy A. Garner, Ph.D, Christi N. Heck, M.D., and Bruce W. Spring, M.D., University of Southern California Keck School of Medicine, Los Angeles, CA 90089 U.S.A.* Twenty years have passed since the 1984 GPEP Report, *Physicians for the Twenty-First Century*, emphasizing the need to limit the amount of factual information presented to the students in order for them to acquire and develop the skills, values, and attitudes needed for physician education/practice. Medical schools to day still struggle with the rising tide of medical information and the need to develop a curriculum, which allows integration of the materials and enhances the problem-solving and clinical reasoning skills of the students. In 2001, Neuroscience faculty at the USC Keck School of Medicine designed a 19-week course aiming to: 1) maximize collaboration among faculty expertise and 2) to assist students in becoming competent in diagnosing clinical presentations of common disorders instead of teaching them neuroanatomy facts in isolation. To accomplish the goals a series of lectures (< 10h/week), small group discussions, and labs (anatomy and pathology) integrated to design a series of weekly themes that began and ended with a patient/clinical presentation. This effort was further enhanced through the ICM and mentor experience both taught in small groups. The selected cases presented common neurological and psychiatric disorders encounter by primary care physicians (i.e., Stroke and Adjustment Disorder, Trauma with Acute Stress Disorder and Substance Abuse). Evaluation data gathered from questionnaires and focus group of the impact and effect of the new curriculum upon students and faculty revealed that both groups have expressed a high level of approval of the manner in which the materials were presented and the level of integration. The cases developed and the variety of case-based teaching modalities employed, contributed to the mastery of the course content and the collaboration of the faculty who manifest “ownership” of the design.

C-14	**INNATE EMPATHY DROPS SIGNIFICANTLY DURING THE FIRST THREE YEARS OF MEDICAL SCHOOL: A SIX-YEAR CROSS-SECTIONAL STUDY** ***Bruce W. Newton, Ph.D.****, Laurie Barber, M.D., Elton Cleveland, M.D., James Clardy, M.D. and Patricia O'Sullivan, Ed.D. Departments of Anatomy, Ophthalmology, Family Medicine, Psychiatry and Educational Development, University of Arkansas for Medical Sciences, Little Rock, AR 72205 U.S.A.* There are two types of empathy: role-playing and innate. Previous studies have shown that medical education decreases role-playing empathy. To examine innate empathy, the Balanced Emotional Empathy Scale (BEES; Mehrabian, 1996) was given to each freshman (M1), sophomore (M2), junior (M3) and senior (M4) class from 1997-2002, at the *beginning* of each academic year. The BEES reveals sex differences, so gender was obtained. Total M1-4 n = 3,197. Male M1-4 n's = 556, 537, 538 & 500, respectively. Female M1-4 n's = 307, 258, 257 & 244. The cohort is 66.6% male. The "normal" BEES score means & S.D. are: males = 29 (28); females = 60 (21); combined mean = 45 (24). Although not shown, the S.D. for our data fall within the reported BEES ranges. Combined BEES for M1 to M4 = 46.26, 41.88, 42.26 & 38.29. Male BEES for M1 to M4 = 40.28, 35.07, 34.56 & 30.84. Female BEES for M1 to M4 = 59.37, 55.48, 56.48 & 53.06. For **combined** BEES scores, significant drops occur after completion of the M1 (basic science) and M3 (clinical) years of 9.7% & 9.4%. The combined M1-4 drop is 17.2%. For **males**, significant drops occur after completion of the M1 and M3 years of 12.9% & 10.8%. The male M1-4 drop is 23.4%. For **females**, significant drops occur after the completion of the M1 and M3 years of 6.6% & 6.1%. The female M1-4 drop is 10.6%. Our results show that males drop their M1-4 BEES scores over twice as much as females. The drop in innate empathy after the M1 year is predictable, but the drop occurring after completion of the first clinical year (M3), when the students are seeing patients, is worrisome. The drop in role-playing empathy, seen in other studies, may be explained by, or may be secondary to, the drop we show in innate empathy. In the past, courses and other curricular activities to enhance role-playing empathy have produced modest and/or short-lived gains. Our data may explain this: since innate empathy is significantly decreasing, it would be more difficult to teach role-playing empathy. If so, then curricular changes designed to teach role-playing empathy must be in place in the basic science years and be continually reinforced throughout the clinical and, we propose, the residency years.
C-15	**A CASE-BASED ELECTIVE COURSE ENABLES SECOND-YEAR MEDICAL STUDENTS TO APPLY THEIR BASIC KNOWLEDGE** ***Ruth D. Thornton, Ph.D,****, Susan Hingley, Ph.D., and Richard Kriebel, Ph.D., Departments of Biochemistry/Molecular Biology, Pathology/Immunology/Microbiology, and Biomedical Sciences, Philadelphia College of Osteopathic Medicine, Philadelphia, PA 19131 U.S.A.* During the final trimester of their second year, medical students prepare for NBOME part 1 examinations as well as continue taking courses which follow a Systems approach at our institution. In acknowledgment of the diversity of the student body, we also offer a variety of elective courses during this trimester. The elective courses allow students to pursue areas of interest as well as to review specific information for their board exams. One such course is Case-Based Learning, which utilizes cases of clinical interest. Students work on a case together in groups prior to class to determine differential diagnoses and order laboratory tests. During class, they receive test results and request any further information to make a final diagnosis. By the end of the first session, each group has made an initial treatment or management plan for the patient described in the case. Students also decide on their learning objectives, which could include relevant basic and applied science information, management issues, and psychosocial, cultural, economic, and ethical issues. At the following session, students share information they found during the week with their group, and then one student from each group presents to the entire class the group's most pertinent findings. They finish the case by selecting a treatment plan for the patient. At this stage, the students are at an "interface" area where they begin to apply their basic knowledge to elements of a disease (C. Eldridge and A. Lambros, AAMC case-based workshop, 2001). This transition time or juncture in their learning allows students to practice "working with" what they "know" from the classroom setting. Students are encouraged to work together and to be critical, in a positive way, of the process and content. Faculty act as facilitators but not as content experts, using Socratic questions to challenge students' boundaries of knowledge. Evaluations of this as well as other electives verified that students' expectations (preparation for board examinations, learning differential diagnostic skills, learning about laboratory tests, and applying basic science to clinical settings) were satisfied.

C-16	**EXPERIENCE WITH A MEDICAL CASE-WRITING ELECTIVE COURSE FOR MS4 STUDENTS** ***Carol F. Whitfield, Ph.D.,*** *Department of Cellular and Molecular Physiology and Office of Medical Education, Penn State College of Medicine, Hershey, PA 17033 U.S.A.* A recent report, The AAMC Project on the Clinical Education of Medical Students, recommends that undergraduate medical students be taught to teach while they are in medical school. Two years ago, I developed an elective course for 4th-year students who were interested in academic medicine, to help them attain some skills in writing cases for problem-based learning or computerized patient simulations. Students selected a topic that was of interest to them, studied the topic in more depth than they had previously, became familiar with a real patient who had the problem (chart review) and collected the data needed to provide a complete interview, physical exam and diagnostic workup of the patient. During the one-month elective, the student met with me at least once a week to plan the case presentation, layout and conclusion. They were required to fill out a workbook with the required data, write up a summary of the case, similar to SOAP notes, write a brief description of the etiology, pathogenesis, pathophysiology and treatment of the problem, and write appropriate learning objectives. The aim was to produce a case that would be at a suitable level for second-year students. To date, 13 students have registered for the course and 9 have successfully completed the requirements. Three of the cases have been formatted for computerized patient simulation exams so far, and one as a PBL case. Student feed back suggests that the course is enjoyable, that they feel they are providing something useful for other students, and that they learned new things about the topic. One difficulty they noted was to put themselves "back to year 2" in their thinking, in anticipating how a younger student may try to approach the case. The course seems to be a success from the students' perspective, is producing a valuable product for the curriculum, and providing experience for students who will be teaching others during their residency.
C-17	**INTEGRATION OF A MEDICAL SCHOOL CURRICULUM: AN EVOLUTIONARY PROCESS** ***Stephanie Wragg, Ph.D.*,*** *Ralph Kolbeck, Ph.D., and Ruth Marie E. Fincher, M.D., Medical College of Georgia, Augusta, GA 30912 U.S.A.* The Medical College of Georgia (MCG) seeks to train health practitioners to meet the health needs of the urban and rural citizens of Georgia. Every year, approximately 360 students are enrolled in the Phase 1/2 program of the School of Medicine (SOM). Congruent with the evolving Liaison Committee on Medical Education (LCME) standards, an integrated curriculum was introduced at MCG in 2000 with the creation of the 'Essentials of Clinical Medicine' course. This course spans the Phase 1/2 years and equips students with the clinical knowledge skills, attitudes and behaviors required for completion of the third-year clerkships. Following its February 2001 site visit, the LCME commended the course and encouraged the ongoing process of both vertical and horizontal integration. This poster describes how the SOM continues to move towards a coherent and coordinated curriculum, in parallel with the introduction of management methods for evaluation of program effectiveness and monitoring of syllabus content. A newly created Phase 1/2 Curriculum Committee, under the direction of the Curriculum Oversight Committee, undertook the task of addressing these issues. The Committee established the following guidelines to direct its work: • Seek input from students, faculty and SOM administrators; • Assess the applicability to the MCG SOM institutional framework of the of integrated curricula from institutions considered either comparable to MCG or models of medical education; • Develop mechanisms to evolve from the existing to a more coordinated curriculum; • Create Curriculum Teams composed of basic scientists and clinicians to revise and develop course content and identify a Curriculum Coordinator to oversee the process. Given the level of institutional support, faculty buy-in and student acceptance of the integrative process, the Phase 1/2 Curriculum Committee has evolved a model ready for approval by the Curriculum Oversight Committee. The resulting curriculum changes at MCG will enhance the learning experience during the pre-clinical years that is crucial for successful completion of the clinical years by our students.

C-18	**CURRICULUM MANAGEMENT AND INFORMATION TOOL** ***Robby Reynolds, M.P.A.**** *and Albert Salas, M.A., Association of American Medical Colleges, Washington, DC 20037-1127 U.S.A.* Available since June 1999, the Curriculum Management and Information Tool (CurrMIT) is a pass-word-protected, online database that offers a full array of support services designed to help medical schools manage and report on their curriculum. CurrMIT is designed for use by Associate Deans for Medical Education, curriculum managers, faculty and medical educational researchers**.** CurrMIT allows users to obtain detailed comparison of curricula among U.S. and Canadian medical schools. The database also allows medical schools to analyze the nations' trends in medical education, support the efficient use of successful curriculum reform strategies by documenting and making available detailed information about ongoing reform and innovation, list information on course directors to foster networking about courses, identify teaching methods and materials being used around the country, review sites used for teaching and learning, identify contact hours devoted to specific topics, determine assessment techniques used to determine whether pre-defined objectives are being met, and answer many other important curricula questions. This computer demonstration will give participants the opportunity to view the experience the power of CurrMIT firsthand.
C-19	**ModellMedA – THE AACHEN APPROACH FOR AN INNOVATIVE MEDICAL CURICULUM REGARDING THE IMPORTANCE OF BASIC SCIENCES** ***Jerome Rotgans, Ph.D.**** *and F.Lampert, Ph.D., Aachen University, Medical Faculty, 52057 Aachen GERMANY* In February 2001 the Aachen Medical Faculty decided upon the development and implementation of an innovative curriculum, the ‚Model Medical Curriculum Aachen' (ModellMedA). Based on the high standard of patient care of the University Hospital – which had been stated shortly before by the evaluation of the Federal Scientific Council – its starting point is ‚Medicine focussing at Quality of Life'. As guide and scenario the concept of Refaat, Richards und Nooman 1989 was adapted to the local needs and actual congitive-psychlogical findings. Now four (instead of three) phases of development are distinguished: (1) the initial phase, (2) the detailed planning phase, (3) the implementation phase and (4) the evaluation phase. *Phase One* focuses on (1) identification of the health needs of the community, (2) identification of the graduate's competences, (3) selection of an explicit curriculum concept and (4) selection and development of faculty. As a result (*Phase Two*) decisions are taken about the learning experiences to be offered. *Phase 3* is characterized by the organizational and logistic planning, resulting in consequent implementation. Final step (*Phase Four*) is the evaluation of the Curriculum in Action. Also first step for the next cycle of an in principle endless holistic process. Because 'Aachen' is traditionally teacher-oriented its "Study Reform Commission" decided to start in *Phase Two*. Its actual aims are: (1) to remove the barrier between pre-clinic and clinic, (2) introduction of a learning spiral (three times repetition of the several organ systems at varying levels, including (i) propaedeutic introduction and homogenization, (ii) systematic, interdisciplinary processing of knowledge and skills, and (iii) clinic), (3) tightening-up of the First Study Phase with relevance for new to implement biomedical/biotechnical curricula (relief for dropouts by changing to another curriculum), (4) to make Aachen more attractive for students. Although modern aspects of adult learning in the first place are mostly ignored, the concept of action research following implementation of quality management principles (i.e. continuous evaluation of the ('New Concept') will result in a successive elevation of the innovation level. This on its turn will stimulate educational research, increase the level of patient care and extension of faculty's responsibility for the community's health. Aachen will develop a unique, competitive profile.

C-20

DEVELOPMENT OF A PHYSIOLOGY-BASED GRADUATE PROGRAM IN COMPLEMENTARY AND ALTERNATIVE MEDICINE

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In the face of rapidly growing interest in Complementary and Alternative Medicine (CAM), government agencies, academic centers, and members of the health care community recognize the importance of conducting rigorous scientific research to assess safety and efficacy of various CAM modalities, as well as to gain insights into mechanisms of action. Georgetown University is among the first academic centers in the United States to integrate teaching of CAM into the 4-year medical school curriculum in a systematic manner. The Department of Physiology & Biophysics has received NIH funding for this curricular initiative. In the present report, we describe the development of a CAM graduate program, offering a Master's degree in a key basic science discipline with concentrated study in CAM, represents a logical step and a core element of this initiative.

The CAM track is seamlessly integrated into Georgetown University's Physiology and Biophysics Master's program. Outstanding faculty members will assure the standard of excellence and state of the art teaching Georgetown students have come to expect. The program will teach students relevant scientific paradigms, prepare them to critically assess various CAM modalities with scientific rigor, and carry out evidence-based research in the field.

As a part of the Physiology and Biophysics Master's program, the CAM track will retain the core curriculum's basic science structure consisting of Biochemistry, Physiology and Biophysics, Pathophysiology, Pharmacology, Immunology and Microbiology. Additional courses include Survey of CAM, Mind Body Medicine, Nutrition and Health, Pharmacognosy, Herbal Medicine and Supplements, Integrative Medicine Journal Club, Experimental Design, as well as Policy and Regulatory Affairs in CAM. An optional tutorial in research techniques will be available to students anticipating further graduate education in a research-oriented field. The program will extend over a three-semester period and offer 30 credits.