BASIC SCIENCE EDUCATOR

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THE *BASIC SCIENCE EDUCATOR*

MISSION STATEMENT

The mission of the International Association of Medical Science Educators is to promote medical education through faculty development and to ensure that the teaching and learning of medicine in the 21st Century continues to be firmly grounded in science. We strive to achieve this by:

- sharing both current and innovative means to teach the sciences fundamental to the practice of medicine, and
- providing a forum for discussion of issues in medical education which affect the basic sciences and those who teach these subjects.

THE BASIC SCIENCE EDUCATOR

WINTER/SUMMER 1997 CONTENTS VOL. 7, NOS. 1&2

Message From The President

Roger W. Koment, Ph.D.

Fulfilling a need; that's what it's all about. In the beginning it was the Basic Science Education Forum (BSEF) which provided the first means for medical faculty to exchange creative and innovative ideas for teaching the sciences basic to medicine. Through the pages of this publication, an internet listserv, and a series of biennial international conferences, the BSEF succeeded in attracting individuals in over 400 medical institutions spread throughout 87 countries of the world! This included every allopathic medical school in North America, as well as most of our osteopathic and podiatric schools. Clearly, there was a need for such communication, and the BSEF was fulfilling that need.

But success had its price. The organization was expanding logarithmically; inevitably, costs of providing needed information and support finally exceeded the resources of our volunteer faculty. Another way had to be found if we were to continue, and on July 1, 1997, that new way was formally announced. The BSEF would undergo internal restructuring to become the International Association of Medical Science Educators (IAMSE). A new organization had been born.

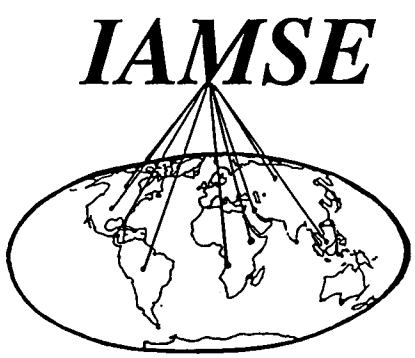
The new structure would be supported by a combination of Foundation, Government, and Corporate grants, proceeds from biennial conferences, the production of educational products, and a nominal membership fee. The governance would be established as required by United States law for the operation of non-profit organizations. That meant a system of membership-elected Officers and Board of Directors would be created, and formal Bylaws would be written. To navigate this unfamiliar course with all its potential pitfalls, the decision was made to contract with an associations management company. Associations International, Inc. in McLean, Virginia, was the company finally selected to become our headquarters, handle our financial concerns, and advise us in all business related matters (see p. 27).

Needless to say, birth can be difficult and sometimes painful. But IAMSE continues to take confident steps while keeping the vision clear. Ten individuals were appointed by the President to serve as an initial Board of Directors. Their names, listed on the inside front cover of this issue, reflect the approximate U.S.-to-International ratio of the original BSEF membership.

One of their first tasks will be to create the initial IAMSE Bylaws. This new leadership also faces the daunting task of coordinating production and distribution of resources in medical science education of the highest calibre, and the guiding of IAMSE to become the world's leading organization for the support of medical science educators. One immediately visible step toward these goals is the development of the *Basic Science Educator* into the only peer review journal devoted specifically to issues of cross-disciplinary medical science education.

Although the infrastructure of IAMSE may have changed from that of the BSEF, importantly our purpose remains the same (see Mission Statement, inside front cover). The new structure of IAMSE will allow us to now achieve many projects only visualized in the BSEF. Examples include, producing the first computerized monograph series titled *Current Topics in Medical Science Education*, and the creation of realtime Faculty Development Workshops available to everyone over the World Wide Web.

And so, as the reincarnation of the BSEF, IAMSE now begins to grow. Its leaders are dedicated to developing this into the premiere faculty organization to provide educational, technical, and psychological support (i.e., Faculty Development) for all those who teach the fundamental sciences. But we cannot do this alone. We need the help and expertise of all those who believe in the medical importance of the disciplines they teach; of those who believe we *can* inspire students with the wonder of scientific discovery; and of those who believe it is *our* responsibility to train competent physicians for the future. Your support through Charter Membership has made it possible to begin organizing the most valuable asset we have, the collective knowledge of our members. IAMSE believes you are committed to grow with us, to share your intellectual and teaching gifts, to reach beyond where you now stand to a brighter and more rewarding tomorrow for your students, your profession, and yourself. Through IAMSE, we will together accomplish the task of successfully fulfilling those needs.



INTEGRATION IN THE BIOMEDICAL SCIENCE CURRICULUM

The dictionary defines "Integration" as the act of bringing all parts together. All of us involved in basic medical science teaching, course management, and curriculum revision have integration as a goal of a particular course or teaching block. One important characteristic of excellent teachers is that they "integrate" the content and concepts they teach with other related concepts students have encountered in the past or will in the future. An integrated teaching encounter typically relates structure to function, the symptoms of disease to alterations of structure and function, or provides a practical example which applies knowledge of the content and concept under discussion. Useful integration in teaching demands depth and breadth in the teacher's knowledge of his/her field and significantly more time, energy and personal study to prepare a successful "integrated" teaching encounter.

Integration can take many forms. I have just described the most common form where a teacher reinforces learning and underscores its value by recognizing an opportune moment for integration; for example, the presentation of clinical laboratory patient data in relation to basic biochemistry content and concepts. Other forms of integration in basic medical science teaching are more elaborate and require a significantly greater investment in faculty time. This form usually involves the inclusion of a major component in a course to satisfy the goal of useful integration. Thus, a Gross Anatomy course might include an introduction to physical diagnosis or an introduction to imaging techniques. In this form of integration, evaluation of any positive outcomes of the integrating activities is very useful and important. Finally, the most elaborate form of integration is that which involves contributions from a team of teachers usually from different disciplines. A good example is the typical Neuroscience Course for medical students. Here strong leadership from the College Administration and the Course Director in support of faculty effort for preparation and sequencing of teaching/learning encounters is critical for success.

The theme of the series of articles to follow in this column is to examine some forms of integration in basic medical teaching, what works, how to evaluate the outcome, and what support is needed. E-mail addresses of authors are included, and your interaction is invited.

SURFACE ANATOMY AS A TOOL TO INTRODUCE FIRST YEAR MEDICAL STUDENTS TO PHYSICAL EXAMINATIONS

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Introduction

The human gross anatomy course taught at the University of Kentucky Chandler Medical Center utilizes multiple teaching techniques including classroom lectures, dissection, computer assisted instruction, skeletons, cross sectional anatomy, sheet films (traditional X-ray, CT and MRI) and surface anatomy. Surface anatomy has been an important component of our teaching methodologies for a number of years for several reasons. First, it allows the student an opportunity to apply the anatomical knowledge they are acquiring in the laboratory and lecture formats to living humans. Second, it provides an opportunity to introduce some basic concepts of physical diagnosis, such as interacting with patients and proper methods for palpation as they relate to anatomical structures. Third, it gives the first year student an opportunity to verbally demonstrate their knowledge on a one-on-one basis as a valuable skill for their clinical years.

Palpation Item List

The organization and administration of the palpation experience is as follows. On the first day of their medical school classes, medical students are given two lists of anatomical landmarks and are told that they are responsible for identifying these anatomical landmarks on living individuals. The first list, consisting of approximately sixty items, is composed of palpation items from the regions of the back, thorax, upper extremity and abdomen. The second list, consisting of 84 items, covers pelvis, lower extremity, and head and neck. In addition to the palpation items of the first list, we include a complete list of terms of orientation and motion which the students are also required to learn. The palpation examinations precede their corresponding major examinations by one week. This earlier scheduling of the oral palpation examination actually motivates the student to begin preparation for each examination earlier than most typically would. The list of palpation items has been compiled over the past twenty years and consists of bony and cartilaginous landmarks, muscles, tendons, ligaments and vascular structures. The faculty has acquired considerable experience using all of these palpation items for the examinations. Although the palpation items are relatively straight forward identifications, they do require a working knowledge of anatomical relationships and provide experience for the student in presenting their knowledge in an oral examination setting. In addition to the requirement of identifying the palpation items, the students are expected to describe relationships of associated structures and demonstrate some associated clinical relevance of the palpation item. At the time the palpation lists are distributed the students are informed that no formal lectures or demonstrations will be offered by the faculty, rather it is expected that the students will learn these on their own. The students are encouraged to begin preparation for the palpation examination early and to meet with faculty to discuss any problems they might encounter with the palpation items. Students for the first palpation are then divided into teams of two and are assigned an instructor for their exercise. It is the responsibility of the students to coordinate with their instructor in selecting an appropriate examination time.

Surface anatomy . . . allows the student an opportunity to apply the anatomical knowledge they are acquiring in the laboratory and lecture formats to living humans.

Palpation Examination

At the time of the palpation the two students meet with the instructor for a half hour during which each student is examined for 15 minutes. Since it is not possible to test all items in the 15-minute period, examination questions are selected from a series of five items representing the subtopics of the assigned palpation items, thereby allowing the student to demonstrate their knowledge in each of the areas with minimal overlap. A typical five-item list for the first palpation would be as follows:

Spine of the 7th Thoracic Vertebra
Biceps Brachii
Head of the Radius
Sternal Angle
Abduction of the Thumb

The first student is asked to palpate on his partner one of the structures from the list. Typically, the students are able to locate the required items but do not have an understanding of the proper methods of palpating an individual. For example, if they are asked to palpate the biceps brachii muscle, a student will typically touch the arm in the region of the biceps brachii muscle. The faculty member might ask how they know that is only the biceps brachii and not additional muscles such as the coracobrachialis. Faculty take the opportunity to interact with the student to convey the concept that they should first think about the expected actions of the muscle they are palpating and then apply resistance to that expected action of the muscle by asking their palpation partner to perform that action. Immediately, the student understands that their partner or their patient is not a passive object but should be involved in the palpation or examination process. One other typical problem the students encounter during their first attempt at palpation is the tendency to palpate too aggressively, often resulting in discomfort for the subject.

The concept is that overly aggressive palpation actually leads to less tactile information. Once the item has been successfully palpated, the faculty member asks the student to describe any relevant facts about the palpation item. This is done to give the student a chance to demonstrate some of their knowledge, as well as giving them a chance to collect their thoughts before the examiner asks a series of specific questions of the student. The specific questions are designed to ascertain if the student understands the anatomy of the palpated item, its relationship to other structures in the region and to apply this anatomical knowledge to some clinical situation. A typical list of questions and correct responses would be as follows:

Sternal Angle

Question: Name the bony structures which comprise the sternal angle?
Answer: Manubrium and Body of the Sternum
Question: What type of joint is the sternal angle?
Answer: Diarthrosis initially, but often ossifies to become a synarthrosis in older individuals
Question: What other specific structure articulate at the sternal angle?
Answer: Costal cartilage of the second rib.

Question: What type of joint is the articulation of the second rib's costal cartilage with the sternal angle?

Answer: Diarthrodial

Question: Name at least four items that are typically found associated with a diarthrodial joint?

Answer: Synovial fluid, synovial membrane, joint capsule, and hyaline cartilage

Question: What is the clinical relevance of knowing the location of the second rib's articulation to the sternal angle?

Answer: It allows the clinician to count intercostal spaces for locating heart valves, position of the anterior thoracic wall, locating heart valve sounds, or lung lobe auscultation.

Question: As an examining clinician of a 42- year-old patient, you suspect that the individual has a heart murmur associated with the bicuspid valve. Demonstrate its location on your partner. At this point the student will usually relocate the sternal angle and count intercostal spaces until they reach the left 5th intercostal space.

Question: Does this auscultation point differ from the actual location of the bicuspid valve?

Answer: It does differ since the actual valve is located at the left 4th chondrosternal junction.

The palpation examinations precede their corresponding major examinations by one week.

At this point the examiner moves to the next item and repeats the examination process again until the student has completed the list of five palpation items. While it may appear that the number of questions is large and would take longer than the allotted 15 minutes, the students typically answer the questions rapidly. It is not unusual to finish a palpation item in less than three minutes. The final item on the list for the first palpation is either a term of orientation or term of motion that the student has to demonstrate. Again the examiner is expected to go beyond the term of orientation or motion and question the student concerning relevant information of the orientation or motion item. Once the first student has completed the palpation examination, the second student chooses a new series of five items. This second palpation examination is conducted in a similar manner. The one difference is that usually the second examination requires individual students to identify palpation items on the examiner.

Student Performance and Evaluation

Each palpation item is worth 5 points, with one point from each item coming from the actual palpation or demonstration of terms of orientation or motion, and the remaining four points based upon the student's answers to the follow-up questions. Thus, a total of 25 points are possible for each palpation examination. The two palpation examinations together represent 12.5% of the student's total grade. This form of testing allows for immediate feedback to be given students on their performance and suggestions, if any, for identifying areas of weakness.

The average point total of each palpation is 24.23 for the first palpation and 24.49 for the second palpation for a typical previous year. As can be seen by the point totals, students perform well in spite of their apprehension prior to the experience. These palpation examinations typically help students' grade average while allowing them to consolidate a large amount of anatomical knowledge prior to a major written examination. Surveys of students' opinions following completion of the course indicate that the majority of students rate this as an extremely positive experience, agreeing that it does help to consolidate their information. Most (88.57%) agree or strongly agree that the palpation exercise was a beneficial experience and should be retained.

Conclusions

Palpation examinations are a positive experience for both students and faculty. They offer an opportunity for the student to begin utilizing the recently learned anatomical knowledge in a format that resembles the process of physical examination, as well as allowing the student to demonstrate their anatomical knowledge beyond the usual written and laboratory examination process. Many times our students complain that they know so much more than what they can demonstrate on traditional written examinations. They probably are correct, but it is nearly impossible in the standard multiple choice examination to test in depth the student's knowledge. The palpation examination solves a portion of this problem by allowing the students to demonstrate their knowledge in several regions to a greater depth than is possible in a more conventional testing situation. While the palpation experience is labor intensive for the faculty (it takes approximately 12 hours of committed time for each of the four faculty members to complete both palpation examinations for our present class size of 100 students), it allows the faculty to work with the students one-on-one and begin teaching the required techniques used in physical diagnosis which the students will take later in their first year of medical school.

The Role of Students in the Quality Control of Medical Education

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Recent graduates of the Faculty of Medicine
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Introduction

In recent times medical education has been rapidly changing, and there is an increasing tendency to base curricula on the educational needs of students. Because it has become impossible to teach students all there is to know, and because curricula are also now required to be more efficient, life-long learning skills have become increasingly important. The key position attributed to students and student learning naturally leads to the expectation that the inclusion of students in curriculum organization forms an integral part of the implementation of student centered learning programmes.

This article reviews why student involvement in quality control of medical education is essential and how medical schools can stimulate students and best gain from their input. A description of the Maastricht situation will serve as an example of how students can become involved.

Why is Student Involvement in Quality Control Important?

The main reason is that students should no longer be viewed as children, but as adults, and treated accordingly. Because they are adults, they can carry responsibility. Student centered learning, therefore, also means having students responsible for their own education. Furthermore, students are the best curriculum experts. They have an overview on the general content of the curriculum and are, therefore, the best source for evaluating the educational programme. As a result of personal experience, students know the actual or hidden curriculum. Staff members know the total curriculum only as it is supposed to be: as it is on paper.

There are several benefits for students with their involvement in quality control. For instance, they have shared control over their own educational programme and have the ability to improve education on behalf of their fellow students. The knowledge that student input is taken seriously and really has consequences for the curriculum is very motivating for students. Due to the close relationship between staff and students, staff members are accustomed to students asking questions. Therefore, they are readily accessible to students. And last, but not least, such involvement gives students experience in meetings, and in preparing for meetings with colleagues on the local, national, and international levels. Students also can become familiar with the business of wheeling and dealing in medical school politics!

The knowledge that student input is taken seriously and really has consequences for the curriculum is very motivating for students.

Of course, the medical school benefits from the students as well. High quality, involved, and motivated students improve the image of a school, and teaching staff receive immediate feedback on the curriculum by the consumers (students). This leads to direct improvement of the curriculum. Students are also an excellent source of new ideas and suggestions for improving the curriculum. The educational input of students is generally of high quality and can have significant influence on the overall outcome of the educational programme. And, such student expertise is available at virtually no cost. Finally, the motivating aspect of collaboration is mutual, enjoyed by both students and staff.

The Maastricht Situation As Example

The following summary of the Maastricht situation is an illustration of how students can become involved.

1. Maastricht Students Evaluate All and Everything

Students evaluate the current programme, they evaluate the staff in their teaching roles, and they evaluate each other. After each curriculum unit or clerkship, students are required to complete an extensive evaluation form. The best motivation for students to engage conscientiously in such activity is to demonstrate that results of these evaluations are taken seriously and actually lead to direct improvement of the curriculum.

The evaluation of teaching staff members in Maastricht serves as direct feedback on their performance. These evaluations are also used in staff promotion decisions. Students evaluate other students on their behavior in the group, upon completion of every tutorial. The main issues are related to group interaction skills, effort, and motivation to contribute to the group process. Unfortunately, these peer evaluations generally tend to be quite superficial, as students are reluctant to be frank or tough with each other.

2. Maastricht Students Critique Current Examinations

After every examination, students are invited to comment on that test. Once constructed by the teaching staff, each examination is critically reviewed in special review committees before it is administered. Upon completion of the exam, students are given the anwer key and may

take the test-booklets home. They have one week to critique the exam questions, for instance, by finding conflicting evidence in the literature. It is only after the student review process that the examination results become definitive. The major consequence of the possibility to comment on an examination is that the quality of the instrument is improved.

3. Students Become Active Within the Educational Organization Itself

The formal committees in the educational organization, their size, and the number of student representatives are indicated in Table 1.

Table 1. Educational Committees at the University of Maastricht Faculty of Medicine

Committee	Committee Size	Student Representatives
Faculty Board	7	2
Faculty Council	12	3
Educational Committee	12	6
Educational Operations	7	2
23 Block Planning Groups	10	2 each
12 Clerkship Planning Groups	7	2 each
Electives / Skillslab	--	5
Student Coordinator	--	1

In Maastricht there is not a single committee, educational or otherwise, without student representation (except, of course, for the examination committee). Approximately 100 students are actively involved in the educational organization, which represents about one-tenth of the overall student population. Thirteen of these student positions are paid for by the medical school, which corresponds to about two full-time equivalents.

4. Medical Students in Maastricht Are Well-Organized

The students who serve on educational committees regularly exchange information in a series of formalized meetings. In this way they remain extremely well-informed. In addition to this exchange of information, students initiate educational policies, and organize various other activities.

5. Students Are Involved in Educational Research

Students may use their educational projects as electives in the curriculum scientific research programme. They are also stimulated by the medical school to attend educational conferences, financially sponsored in most cases by the school, or by individual staff members. Apart from presenting papers and writing articles, participation at conferences in itself is very motivating and stimulating. Students are exposed to new ideas and become even more closely involved with the educational organization.

Conclusions and Implications for Practice

The main conclusion is that students are important as quality controllers in medical education. But the question remains, how to get students actively involved. There are many techniques a medical school can use to improve involvement of their students.

Firstly, allow student evaluation of various aspects of the curriculum to have real and demonstrable consequences for the curriculum. Without consequences, evaluation becomes meaningless, and no student will conscientiously participate if the results are not taken seriously. Secondly, full involvement requires full equality and commitment of partners. Students should, therefore, be allowed and encouraged to participate in the educational organization. Furthermore, teaching staff should allow students to take part in new developments such as reorganizations within the curriculum.

For maximum achievement, students must have facilities at their disposal; e.g., their own work space with computers, telephone, etc., and rooms where they may hold meetings. To further stimulate students, the medical school can provide student incentives either in the form of financial compensation, or in terms of accrediting educational activities as part of the formal curriculum. The most important consideration, however, is an open and accepting attitude of the staff members. This condition must be fulfilled before other efforts will result in more student involvement.

The final conclusion is that students are adults. By considering them so, and treating them accordingly, both the medical school and the students will benefit. And if all concerned are fully aware of the possibilities of the student as a quality controller, then students will become full and valued partners in medical education.

This paper was presented at the 7th Ottawa International Conference on Medical Education and Assessment, Maastricht, The Netherlands, in June of 1996.

MORE WOMEN FACULTY AT U.S. MEDICAL SCHOOLS, AAMC REPORTS

The percentage of women faculty in U.S. medical schools rose from 25.6 percent in 1996 to 26.1 percent in 1997, according to *U.S. Medical School Faculty,* 1997, recently published by the AAMC. The 1997 figures represent an increase of 6.8 percent over the past decade.

The book is compiled annually from the AAMC's Faculty Roster System and serves as a reference source for the most frequently asked questions about medical school faculty. It contains 10 figures and 20 tables designed to answer questions about medical school faculty distribution, including data on age, specialty area, department, rank, degree, sex, and ethnicity.

Information: Charles Elliott, director, Faculty Roster System, TEL: (+)1-202-828-0650, E-MAIL: celliott@aamc.org. Orders: AAMC Publications, TEL: (+)1-202-828-0416.

Source: AAMC STAT <gshaw@aamc.org> Short, Topical, And Timely News From the Association of American Medical Colleges

ANNOUNCEMENT

1999 IAMSE CONFERENCE — CALL FOR VOLUNTEERS

The next Biennial Conference of the International Association of Medical Science Educators has been scheduled for June 19-22, 1999. Final decisions regarding the conference site, host institution, and theme will be made in the spring of 1998.

If you would like to volunteer to help organize this conference, or if your school would like to be considered as the hosting institution, please contact Roger Koment before May 1, 1998, for further information at E-MAIL: rkoment@sunbird.usd.edu, FAX: (+)1-605-677-6299, or TEL: (+)1-605-677-5174. Conference website: http://www.usd.edu/IAMSE/confer.htm (IAMSE's general website address is: http://www.usd.edu/IAMSE)

STRATEGIES FOR TEACHING MEDICAL SCIENCES IN THE 21ST CENTURY — A CONFERENCE OVERVIEW

JUNE 21-24, 1997

ROGER W. KOMENT, PH.D., IAMSE PRESIDENT

The Third Biennial International Conference of the Basic Science Education Forum was hosted once again by the Medical University of South Carolina at the Hawthorne Suites Hotel in Charleston, SC. Many will recall this was the site of our very successful First Biennial Conference in 1993. As in previous years, demand exceeded space, but we stretched stated logistical limits to register 178 individuals. Faculty participants this year represented 87 medical schools from 11 countries. These were Argentina, Bulgaria, Canada, China, Grenada, Israel, Malaysia, Russia, Turkey, United Kingdom, and the United States. Forty participants had significant speaking presentation roles, while an additional 47 authors were represented by poster presentations.

The Organizing Committee who designed and orchestrated this conference consisted of four faculty and two directors. The four faculty were: **Thomas Viggiano, M.D.** (Mayo Clinic and Medical School); **Jane Scott, Ph.D.** (Wright State University); **Michael Schmidt, Ph.D.** (Medical University of South Carolina); and **Charles Puglia, Ph.D.** (Allegheny University of the Health Sciences). The two directors were **Roger Koment, Ph.D.** (BSEF Executive Director) and **Gabriel Virella,** M.D., Ph.D. (Conference Host and Site Director). Dr. Virella is Professor and Vice Chair of Microbiology and Immunology at the Medical University of South Carolina. As at previous conferences, participants attended a Saturday evening Reception, this time graciously sponsored by **Lippincott-Raven Publishers**. The Opening Session on Sunday morning featured an address by **Layton McCurdy, M.D.,** Dean of the College of Medicine, Medical University of South Carolina. Dr. McCurdy spoke of the importance of this conference and warmly welcomed all participants to Charleston and the Medical University.

Our Organizing Committee chose to approach this topic, *Strategies for Teaching Medical Sciences in the 21st Century,* by dividing it into four discrete and sequential subtopics, each being the subject of a Plenary Session. Mornings were devoted to those Plenary Sessions, which were then followed by a double series of afternoon Breakout Sessions addressing individual related issues.

1) The Physician of the 21st Century: Knowledge, Skills, and Attitudes

It was unanimously agreed that, before we, as educators in basic science, began discussing how and what amount of basic science to teach physicians in training, it would be wise to have a realistic view of a physician's needs for the future practice of medicine. Invited speakers **Rhee Fincher, M.D.,** (Medical College of Georgia), and **Allen Neims, M.D., Ph.D.,** (University of Florida) addressed this subtopic in a Plenary Session which was organized and moderated by **Thomas Viggiano, M.D.,** (Mayo Clinic and Medical School).

2) Determining and Evaluating the Science Curriculum for the 21st Century

This Plenary Session was organized and moderated by **Roger Koment, Ph.D.,** (University of South Dakota) and featured presentations by **Gabriel Virella, M.D., Ph.D.** (Medical University of South Carolina) and **Elizabeth Simons, Ph.D.** (Boston University). As anticipated, the presentations generated audience discussion resulting in a diversity of opinions being expressed. The three speakers, collectively representing nearly 70 years of teaching experience in basic science, agreed upon points that described how relevance of content, computer technology, and actual physician needs must guide us in the coming millennium.

Following lunch, registrants actively participated in a series of Concurrent Breakout Sessions addressing issues related to the two morning Plenary Sessions. These were: *Science and Physician Attitudes; Teaching Science for Knowledge and Problem-Solving Skills; The Team Approach to Learning Science;* and *Integrating Science Throughout the Curriculum.*

Monday morning began once again with two Plenary Sessions.

3) Technology and Medical Education in the 21st Century

This important Plenary Session, organized and moderated by **Michael Schmidt, Ph.D.,** (Medical University of South Carolina) addressed a number of issues providing a glimpse into the future of how computers will impact on the way we teach. Presentation/demonstrations were provided by **Jim Swierkosz, Ph.D.** (St. Louis University); **Thomas Nosek, Ph.D.** (Medical College of Georgia); and **Tom Basler, Ph.D.,** (Medical University of South Carolina).

4) The Impact of Downsizing on Medical Education and the Basic Sciences

This final Plenary Session addressed a subject which lurks in the minds of all medical science educators — how in the future will we maintain our professional standards of achievement with yet further reductions in

resources. **John Burdick, Ph.D.** (Chicago College of Osteopathic Medicine) was invited to organize and moderate this session, and he chose for his co-presenters **James Buggy, Ph.D**. (University of South Carolina), and **Donna Murasko, Ph.D.** (Allegheny University of the Health Sciences).

That afternoon was devoted to another double series of Breakout Sessions which considered issues relating to the two morning Plenary Sessions. These were: *The Future of Problem-Based Learning in an Era of Downsizing; Developing Information Resource and Life-Long Learning Skills; Getting Basic Science Into the Clerkships and Beyond;* and *Applications of Computer Technology*

On Monday evening, participants enjoyed our conference social event — a Charleston Harbor Dinner Cruise. By chartering the entire ship, all were treated to an engaging tour of famous U.S. Revolutionary War sites, typical South Carolina shoreline scenery, and camaraderie with fine dining.

Tuesday morning began with several concurrent Breakfast Workshops: *Basic Science on USMLE Steps 2 and 3; Teaming Up the Physician and the Basic Scientist; Documenting Faculty Achievement in the 21st Century; Techniques for Small Group Teaching of Basic Sciences; How to Define Relevance in the Basic Sciences;* and *How to Design Multiple Choice Tests That Go Beyond Trivial Recall.* These were then followed by two featured conference events.

The first was a presentation/demonstration and discussion of plans for the computerization of the United States Medical Licensing Examination (USMLE), presented by **Robert Galbraith, M.D.** (National Board of Medical Examiners). The title of his presentation was *Computerized USMLE Tests: Theory and Practice.* Computerization of assessment is not without certain problems, but importantly it brings significant advantages. Clearer visuals which enhance histological and pathological specimens and X-rays, audio capability, and even animation are only some of the benefits available through computers. This method will also provide for increased flexibility of USMLE scheduling, and individualized assessment.

Our second feature that morning was a Point-Counterpoint Debate which addressed the question *Curriculum Governance in the 21st Century: Centralized vs. Departmentalized?* The session was organized and moderated by **Jane Scott, Ph.D.** (Wright State University). Debaters were **Ted Groshong, M.D.** (University of Missouri-Columbia) speaking on behalf of Centralized Governance, and **Harry Margolius, M.D., Ph.D.** (Medical University of South Carolina) supporting the position of Departmentalized Governance. Excerpted versions of both Tuesday morning features will be appearing in the next issue of the *Basic Science Educator.* In addition, direct full length transcripts of these and all Plenary Session presentations will be printed in the Conference Proceedings document (see p. 17).

The purpose of this conference was to begin addressing some of the topics which we, as faculty, undeniably will encounter in the future, and was predicated upon issues familiar to many of those in attendance. Such issues drew inquiries from the medical faculty of 20 countries expressing interest in contributing and participating in this conference. Although financial constraints for many ultimately reduced participation to only 11 countries, this level of interest is further evidence of the global need for information to be shared among all medical science faculty, regardless of discipline or geographic boundaries. One decision unanimously resolved by conference participants during the BSEF Business Meeting was to open these conferences to more participants, yet still retain a limited number per school. However, instead of that limit being four individuals per school, it was agreed the number should be increased to six per school. In the future, as we become more accustomed to orchestrating larger conferences, it is inevitable that this last restriction will also be abolished.

These new procedures will be implemented at our next Biennial International Conference, which has been scheduled for June 19-22, 1999. The site, host institution, and theme for this conference will be finalized this spring. If you would like to nominate your school to host this event, or would like to participate in organizing it, please contact Roger Koment before May 1, 1998. Watch for announcements of this and other events, including availability of Conference Proceedings, in future issues of the *Basic Science Educator* and posted on our website at http://www.usd.edu/IAMSE

NB: The Conference Directors and Organizing Committee are pleased to recognize those who provided financial support toward this conference and displayed their latest educational products.

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Strategies for Teaching Medical Sciences in the 21st Century

Hosted by the Medical University of South Carolina
Charleston, South Carolina, U.S.A. June 21-24, 1997

This conference was directed toward all faculty who teach within a medical environment, with particular focus on those responsible for the basic sciences. Methods for teaching and learning are rapidly changing as we approach the 21st Century and many new circumstances arise: dissolution of traditional departmental boundaries, centralized governance of medical courses restructured under exotic new names, new roles for faculty but fewer numbers, changing student demographics and learning styles, and everywhere the influx of computer technology. How can we, as faculty, embrace and guide these changes for the benefit of our students and expand our own abilities for the task of producing physicians for the 21st Century?

These and other issues concerning the future were addressed in plenary session presentations and panel discussions, small group sessions and breakfast workshops. This year also featured a point-counterpoint debate on Centralized vs. Departmentalized Governance of the Medical Curriculum, and a special presentation by the National Board of Medical Examiners on the future of computerized USMLE testing.

SATURDAY June 21, 1997

3:00 - 6:00 pm REGISTRATION
6:00 - 9:00 pm CONFERENCE RECEPTION and SOCIAL

SUNDAY June 22, 1997

7:00 - 8:30 am BREAKFAST
8:30 - 9:00 am WELCOME and CONFERENCE OVERVIEW
Roger Koment, Ph.D., BSEF Executive Director
Gabriel Virella, M.D., Ph.D., Conference Host and Site Director
Layton McCurdy M.D., Dean, College of Medicine, Medical University of South Carolina
9:00 - 10:30 am **PLENARY SESSION I**
The Physician of the 21st Century: Knowledge, Skills, & Attitudes
Thomas Viggiano, M.D. (Moderator), Rhee Fincher, M.D., and Allen Neims, M.D., Ph.D.
10:30 - 11:00 am COFFEE BREAK
11:00 - 12:30 pm **PLENARY SESSION II**
Determining and Evaluating the Science Curriculum for the 21st Century
Roger Koment, Ph.D. (Moderator), Elizabeth Simons, Ph.D., and Gabriel Virella, M.D., Ph.D.
12:30 - 2:00 pm LUNCH
2:00 - 6:00 pm POSTERS and EXHIBITS
2:00 - 3:30 pm CONCURRENT BREAKOUT SESSIONS
Session A1 Science and Physician Attitudes *Allen Neims, M.D., Ph.D.*
B1 Teaching Science for Knowledge and Problem-Solving Skills *E. Pat Finnerty, Ph.D.*
C1 The Team Approach to Learning Science *Charles Puglia, Ph.D. and Angelo Pinto, Ph.D.*
D1 Integrating Science Throughout the Curriculum *Norman Levine, Ph.D.*
3:30 - 4:00 pm COFFEE BREAK
4:00 - 5:30 pm CONCURRENT BREAKOUT SESSIONS
Session A2 Science and Physician Attitudes *Anthony DeLucia, Ph.D.*
B2 Teaching Science for Knowledge and Problem-Solving Skills *Henry Mandin, M.D.*
C2 The Team Approach to Learning Science *Susan Watson, Ph.D.*
D2 Integrating Science Throughout the Curriculum *Adrianne Rogers, M.D.*
5:30 pm BSEF BUSINESS MEETING
6:30 pm DINNER ON YOUR OWN

THIRD BIENNIAL INTERNATIONAL BSEF CONFERENCE

MONDAY June 23, 1997

7:00 - 8:30 am	BREAKFAST
8:00 - 5:00 pm	POSTERS and EXHIBITS
8:30 - 10:00 am	**PLENARY SESSION III**
	Technology and Medical Education in the 21st Century
	Michael Schmidt, Ph.D., (Moderator), Tom Basler, Ph.D., Tom Nosek, Ph.D., and Jim Swierkosz, Ph.D.
10:00 - 10:30 am	COFFEE BREAK
10:30 - 12:00 pm	**PLENARY SESSION IV**
	The Impact of Downsizing on Medical Education and the Basic Sciences
	John Burdick, Ph.D. (Moderator), James Buggy, Ph.D., and Donna Murasko, Ph.D.
12:00 - 1:30 pm	LUNCH
1:30 - 3:00 pm	CONCURRENT BREAKOUT SESSIONS
	Session E1 The Future of Problem-Based Learning in an Era of Downsizing *Charles Eldridge, Ph.D.*
	F1 Developing Information Resource and Life-Long Learning Skills *Richard Kriebel, Ph.D.*
	G1 Getting Basic Science into the Clerkships and Beyond *Loice Swisher, M.D.*
	H1 Applications of Computer Technology *Robert Ogilvie, Ph.D.*
3:00 - 3:30 pm	COFFEE BREAK
3:30 - 5:00 pm	CONCURRENT BREAKOUT SESSIONS
	Session E2 The Future of Problem-Based Learning in an Era of Downsizing *Elizabeth Simons, Ph.D.*
	F2 Developing Information Resource and Life-Long Learning Skills *Arnold Smolen, Ph.D.*
	G2 Getting Basic Science into the Clerkships and Beyond *Denise Ferrier, Ph.D.*
	H2 Applications of Computer Technology *Nehad El-Sawi, Ph.D.*
6:30 pm	CHARLESTON HARBOR DINNER CRUISE (social event)

TUESDAY June 24, 1997

8:00 - 9:30 am	CONCURRENT BREAKFAST SESSIONS
	1. Basic Science on USMLE Steps 2 and 3 *Robert Galbraith, M.D.*
	2. Teaming-Up the Physician and the Basic Scientist *Thomas Viggiano, M.D. and Kenneth Somers, Ph.D.*
	3. Documenting Faculty Achievement in the 21st Century *Jay Menna, Ph.D.*
	4. Techniques for Small Group Teaching of Basic Sciences *Walter Myers, Ph.D.*
	5. How to Define "Relevance" in the Basic Sciences *Kanchan Rao, M.D. and Henry Mandin, M.D.*
	6. How to Design Multiple Choice Tests That Go Beyond Trivial Recall *Gabriel Virella, M.D., Ph.D.*
9:30 - 10:30 am	**SPECIAL PRESENTATION**
	Computerized USMLE Tests: Theory and Practice *Robert Galbraith, M.D.*
10:30 - 11:00 am	COFFEE BREAK
11:00 - 12:00 pm	**POINT-COUNTERPOINT DEBATE**
	Curriculum Governance in the 21st Century: Centralized vs. Departmentalized
	Harry Margolius, M.D., Ph.D. and Ted Groshong, M.D. (Jane Scott, Ph.D., Moderator)
12:00 pm	CONFERENCE CLOSURE *Roger Koment, Ph.D. and Gabriel Virella, M.D., Ph.D.*

CONFERENCE ORGANIZING COMMITTEE

Roger W. Koment, Ph.D. *(Chair)*
Executive Director
Basic Science Education Forum
University of South Dakota School of Medicine

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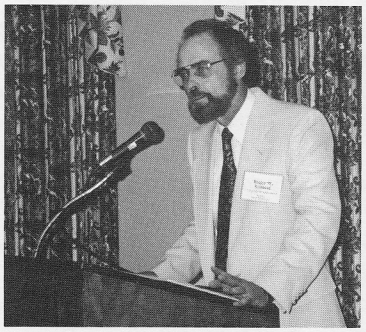
Medical University of South Carolina

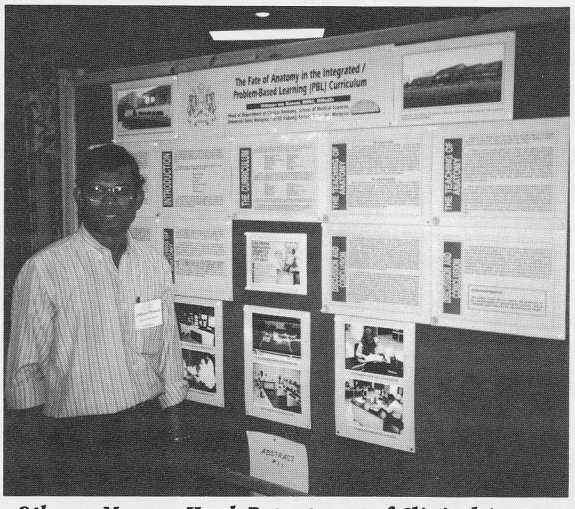
Scenes From The Third Biennial International Conference of the Basic Science Education Forum



Dr. Roger Koment, BSEF Executive Director, opens the Third Biennial International Conference

Including our Corporate Sponsors and Exhibitors, 178 individuals participated in this conference

(Left to right), conference participants Dr. Gönül Peker (Ege University School of Medicine, Izmir, Turkey); Dr. Nadezhda Ardentova (Saratov State Medical University, Saratov, Russia); and Dr. Guichun Han (Dalian Medical University, Dalian, China)



Dr. Othman Mansor, Head, Department of Clinical Anatomy at the Universiti Sains Malaysia School of Medical Sciences, Kota Bharu, Malaysia and his poster presentation on "The Fate of Anatomy in the Integrated Problem-Based Learning Curriculum"

Conference Program Organizers are recognized for their efforts (left to right), Dr. Thomas Viggiano (Mayo Clinic and Medical School, Rochester, MN); Dr. Michael Schmidt (Medical University of South Carolina, Charleston, SC); and Dr. Jane Scott (Wright State University School of Medicine); not pictured is Dr. Charles Puglia (Allegheny University of the Health Sciences, Philadelphia, PA)

Plenary Session Speakers Dr. Gabriel Virella (Medical University of South Carolina) and Dr. Elizabeth Simons (Boston University)

Conference Directors (left to right) Dr. Gabriel Virella (Conference Host and Site Director) and Dr. Roger Koment (BSEF Executive Director)

THE EDUCATOR'S PORTFOLIO

ASSOCIATE EDITOR: JAY H. MENNA, PH.D.

As our readers know, for many years the documentation of educational efforts of medical school faculty has taken a "back seat" to the verification of research and clinical activities in the faculty reward system. We are now beginning to see a glimmer of light that documentation of educational efforts will enter stage left and become an element of the scene of faculty development; and importantly as well, in the promotion and tenure process. Some medical schools have made significant progress in the documentation of the educational efforts of their faculty, but many more still need to address the problem. Recently, the College of Medicine, University of Arkansas for Medical Sciences (UAMS) addressed the issue of a universal protocol for the documentation of faculty educational contributions — addressing both quantity and, importantly, quality. In this issue of the Basic Science Educator, *Diane Heestand, Ed.D., Director of the Office of Educational Development at UAMS, discusses the ongoing efforts of the College of Medicine, to establish a universal system for documentation of faculty educational activities. I think you will find Dr. Heestand's article informative and directional.*

RECOGNIZING EDUCATIONAL ACTIVITIES: A SEARCH FOR IDENTITY BY ONE SCHOOL

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Introduction

Much has been written and said about the recognition, documentation, and evaluation of educational activities since the publication in 1990 of Ernest Boyer's classic report, *Scholarship Reconsidered: Priorities of the Professoriate.* For Boyer, the issue was the reward system for faculty and the question was, "what activities of the professoriate are most highly prized?"[1] He concluded that "on far too many campuses, teaching is not well-rewarded, and faculty who spend too much time counseling and advising students may diminish their prospects for tenure and promotion. Research and publication have become the primary means by which most professors achieve academic status...."[2] The change in priorities of the faculty of medical schools has been noted by many in medical education. Stephen Abrahamson contrasts the medical school faculty member immediately after World War II with the faculty member of today:

> In other words, a faculty member was a *teacher* and expected to do some research. Today, those two roles have been reversed. Today, the faculty member is expected to be an investigator, obtain outside funding for his or her own research, publish widely in prestige journals...and do a little teaching, undoubtedly to justify a faculty appointment.[3]

Each medical school sets the expectations for its faculty formally through appointment, promotion, and tenure guidelines and the accompanying processes for documentation and evaluation of recognized and valued activities. In addition, the leadership of each school, including departmental chairs, deans, and committee chairs, may set expectations through annual reviews and other means of recognition.

The following article is a brief account of how one medical school continues its redefinition of expectations for faculty who are responsible for its educational programs. While every medical school is different in its operation and culture, there may be some common themes that are of benefit to others attempting to redefine expectations for faculty. Certainly, the College of Medicine at the University of Arkansas for Medical Sciences (UAMS) has benefited from the work of other medical schools in this area.

University of Arkansas for Medical Sciences

The three-part mission of UAMS is to "provide excellent educational opportunities for students . . . in a stimulating environment of basic and clinical research, integrated with the delivery of superb, comprehensive health care services."[4] As in other academic medical centers, the mix and expression of education, research, and patient care are constantly changing as the result of the changing needs of society, changing policies, and new knowledge. Most recently, the financial base for academic medical centers has come under closer scrutiny and the need for measures of accountability in education, research, and patient care that address quantity, quality, and outcome is critical.

The need to refine the current methods of recognizing, documenting, and evaluating educational activities became part of a proposal to the Arkansas Department of Higher Education to fund the development of a faculty development curriculum and an evaluation system to foster excellence in education. With the funding of the proposal, the Dean appointed a committee of senior faculty and educational consultants to: 1) define the educational activities to be evaluated and rewarded, 2) develop an evaluation system that identifies indicators of quality and quantity, 3) de-

velop a cost-effective documentation system for collecting the necessary information, 4) identify other means to recognize excellence in education aside from promotion and tenure, and 5) suggest a means to implement the system. The committee is chaired by the Associate Dean for Academic and Student Affairs and includes the Associate Dean for CME and Faculty Development, Associate Dean for Minority Student Affairs, Assistant Dean for Medical Education, Assistant Dean for Graduate Medical Education, Chairman of the Department of Surgery, Chairman of the Promotion and Tenure Committee, Chairman of the Curriculum Committee, other senior faculty, and two faculty from the Office of Educational Development.

The Committee first reviewed models of evaluation and documentation from the University of Kentucky College of Medicine, Eastern Carolina University School of Medicine, University of Illinois at Chicago College of Medicine, Bowman Gray School of Medicine, Medical College of Pennsylvania and Hahnemann University School of Medicine, and the Medical College of Wisconsin. In addition, information was collected about similar efforts to document and evaluate educational activities at other medical schools through e-mail requests. The Committee also reviewed the forms currently used by UAMS College of Medicine Promotions and Tenure Committee. After review and discussion, the Committee agreed that the documentation and evaluation system to be designed would be used for faculty development, annual review, and promotion and tenure decisions. They also agreed to the types of educational activities to be included.

Subsequently, the Educational Evaluator from the Office of Educational Development, developed a prototype computer-based spreadsheet and log to track information about the activities. While the form is still undergoing refinement, it provides a template for information about the quantity and quality of a faculty member's teaching of medical students, graduate students, residents, fellows, peers, and the community. Information includes the hours of student contact and type of instruction (lectures, labs, one-on-one, etc.), and assessment of teaching by students. Other activities documented include: student advisement, participation in faculty development and CME or postgraduate studies, curriculum development, development of educational materials, educational administration, and scholarship activities and honors received related to the science and art of education.

Information includes the hours of student contact and type of instruction (lectures, labs, one-on-one, etc.), and assessment of teaching by students. Other activities documented include: student advisement, participation in faculty development, and CME or postgraduate studies, curriculum development, development of educational materials, educational administration, and scholarship activities and honors received related to the science and art of education.

The development of the documentation system is still a work-in-progress, and the redefinition of the evaluation system will follow the development of the documentation system. While the order may appear backwards, much of the early discussion by the full Committee centered on adoption and implementation issues. Quite naturally there was considerable concern about adoption by faculty members and especially the Department Chairs. No one wanted to maintain an onerous database of information that would not be used. Thus, the Educational Evaluator has shown the Committee a relatively simple method by which each faculty member can maintain his/her own database. As members of the Committee review the components of the database, suggestions are forthcoming about more rigorous evaluation and review of educational activities.

Several factors have enabled UAMS College of Medicine to make substantial progress on recognizing educational activities. The effort began as part of a project funded by the Arkansas Department of Higher Education and so carried with it external funding and accountability. I. Dodd Wilson, Dean of the College of Medicine, has enthusiastically supported the project and reiterated on numerous occasions his desire that the project be completed in a timely fashion. Lastly, the Committee's composition reflects a balance of opinions from senior faculty about the need for and feasibility of a documentation and evaluation system. In addition, the Committee has been able to draw upon the expertise of a professional educational evaluator.

The future tasks before the Committee are significant. Much work needs to be done to improve the evaluation of teaching activities in a cost-effective manner. The documentation and evaluation system has yet to be approved by faculty members and department Chairs, and it must then be implemented. In addition, the Arkansas legislature eliminated the funding of faculty development grants through the Arkansas Department of Higher Education. It is anticipated that there will be some funding for the continuation of the faculty development curriculum and completion of the documentation and evaluation system through the UAMS Strategic Educational Development Fund, a fund controlled by the Chancellor's Cabinet.

Conclusions

The benefits of the proposed system are significant. Currently faculty in the College of Medicine may choose one of three tenure track pathways: basic scientist, clinical scientist, and clinical educator. Statistics indicate that faculty in the clinical educator pathway enjoy the higher percentage of promotion and tenure approvals. However , a review of the promotion and tenure guidelines indicates there is little counsel for either faculty or the Promotion and Tenure Committee concerning such promotions and approval of tenure. By creating the documentation and evaluation system, the College of Medicine provides the information from which future Promotion and Tenure Committees can make informed decisions about the contributions of faculty to the educational program. The College of Medicine also defines the expectations of its educators and establishes its identity as an educational institution.

References

1. Boyer, E.L. 1990. *Scholarship Reconsidered: Priorities of the Professoriate.* Carnegie Foundation for the Advancement of Teaching, Princeton, New Jersey, p.xi.
2. Ibid. p.xii.
3. Abrahamson, S. 1996. *Essays on Medical Education.* University Press of America, Inc., New York, p. 136.
4. University of Arkansas for Medical Sciences. 1995. *Six-Year Plan: 1995-2001.* p.7.

THEY NEVER TEACH YOU ANYTHING . . .

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As a clinician, I have spent a great deal of time contemplating the editorial in last winter's *Basic Science Educator,* in which the concept of "too much basic science in the first two years" was refuted. Personally, I do not feel there is too much basic science in the first two years, rather there is too little integration of basic and clinical science across the four years of the U.S. medical school program. However, if an adversarial relationship between basic scientists and clinicians is allowed to exist and U.S. medical school education continues as two two-year programs, I can guarantee that the clinicians will virtually always win the battle for the students' hearts and minds.

"Why?," you may ask. First, most students do not go to medical school to become researchers. They have the desire to help people, heal the sick, and care for the injured. They have the desire to be a physician. In today's world they will need to tackle managed health care, quality assurance, and utilization review. They will need to deal with ethical problems, economic constraints, and medicolegal issues. They will need to learn how to comfort a grieving widow, confront a child abuser, and supervise subordinates. They will need to balance family life and clinical work. The basic sciences are just a part of the journey to becoming a doctor. Students, in general, are more likely to gravitate towards clinicians to answer these questions and show them the way.

More importantly, clinicians have the last chance to mold students' opinion during which time basic scientists have little or no chance to refute, reform, or refine the opinions. Therefore, students are indoctrinated into a way of thinking that is passed from one class to the next. As a clinician, I have found three particular phrases that occur routinely in the clinical setting. In fact, I can think of specific instances in my own life that lend supportive evidence to their "inherent truth." Let me share these phrases with you.

They never teach you anything useful in the first two years... "This is the eighth hospitalization for this 50 yo WF with a h/o DM, HTN, CHF and CAD, who comes in with the cc of CP, SOB, and DOE." As a third-year medical student, I remember staring at the first line of this history and being terrified. It was almost entirely in foreign language! How was I ever going to pass if I couldn't speak medicolese? At least when I was in Germany, I could point, gesture, and hope that someone spoke a little English so that I could be understood. That would never do in this situation. I wanted to be viewed as a competent student — a good student. How could I shine if I couldn't even decipher what was wrong with the patient?

Anger slowly replaced the fear. Why had I not been prepared? Certainly someone must have known what would have been helpful. I couldn't have been the first student who felt overwhelmed. Then a great light appeared and an omniscient fourth-year subintern came forth saying, "Don't worry. They never teach you anything useful in your basic science years that you have to know in your clinical years. By next year, it will be natural and you'll be saying the same thing to the new, scared third-years." And, it was true. The next year, I spoke medicolese! I comforted those terrified third-years saying, "Don't worry. They never teach you anything useful in your first two years."

They never teach you anything important in the first two years... Actually, this is not exactly true. Really, the phrase should go, *"They never teach you anything important in a framework you can use; and if they do, you probably didn't recognize that it was important!"* Taking the first part — the first two years in a traditional U.S. curriculum teach you about diseases causing a host of symptoms. In the clinical years, patients rarely come in telling you their pathophysiological process. Clinical reasoning goes in the other direction — a patient presents with a symptom and a variety of potential diseases are entertained. For example, in the first two years a student may learn about gout and pseudo-gout in biochemistry, Lyme disease and gonococcal arthritis in microbiology, and lupus and rheumatoid arthritis in pathology. However, when presented with a 38-year-old woman with a swollen knee in medical clinic, and the at-

tending asks for a differential diagnosis, the thinking has to be quickly reversed. For many students the mental framework has to be entirely rebuilt in the third year to accommodate this clinical reasoning pattern.

The second part — *you didn't recognize it was important.* I remember being furious at my physiology professor for allowing a picky question on the final examination; the answer I could easily have looked up if I really needed to know it. That absurd question asked for the blood values for sodium, potassium, chloride, and bicarbonate. Had I realized that I would be using those values dozens of times during every clinical emergency department shift I work, I might have felt differently about the question. At the time, I thought it was just a way to separate the "A's" from the "B's."

Personally, I do not feel there is too much basic science in the first two years, rather there is too little integration of basic and clinical science across the four years of the U.S. medical school program.

You never will have to know that anyway... I believe this is a favorite phrase of physicians who don't remember their basic science, and need to say something when a student brings up a point they either didn't know, or had forgotten. While facilitating a problem-based curriculum course, I found that a commonly held clinical belief was wrong, and has been known to be wrong for at least 30 years! That belief is that the reason there are low cerebral spinal fluid glucose levels in bacterial meningitis is because the bacteria metabolize the glucose. It's not true! The bacteria could never eat enough glucose to overwhelm the glucose transport mechanism. I was astounded that I didn't know this, that texts were wrong, and that physicians continued to teach incorrect information. I passed this amazing revelation on to my colleagues and was rewarded with indifference. The response, "It's easier to remember bacterial meningitis has low glucose if you think it's because the bacteria eat it. This works well enough clinically. Why change?" In some ways it is accurate. I must know the difference between bacterial and viral meningitis. However, I will never have to know why the glucose is low to be able to treat the patient.

What can we do to break this cycle? There must be more integration, both of content and people. I have found working in a problem- based curriculum to be particularly rewarding for the students and myself. The students are introduced to the language, the differential diagnosis, the laboratory results, and the management that allows them to devise their own mental clinical framework. In addition, they get to develop interpersonal and teaching skills. For me, the review of old information and the incorporation of new information has been enlightening. An even greater benefit comes from learning who are the people on the other side. At my institution, the medical school is several blocks away from the hospital. If I did not participate in the problem-based program, I probably would never meet any of the basic scientists. Getting to know one another is the first step towards utilizing each others' expertise. Who knows, eventually, there may even be basic science electives in residencies. I've heard more than one physician say, "I wish I could go back and do some basic science again, now that I know what I need to know."

CONFERENCE PROCEEDINGS — UPDATE

Proceedings of the Third Biennial International Conference of the Basic Science Education Forum will soon be available for a nominal fee. This conference, hosted by the Medical University of South Carolina on June 21-24, 1997, in Charleston, South Carolina, U.S.A., was titled Strategies for Teaching Medical Sciences in the 21st Century *(see p. 9)**. The Proceedings will include audiotranscripts of all Plenary Session presentations, including audience discussions; a compendium of 500-word Summaries submitted by Breakout Session Leaders describing the main points of discussion and the outcome for each session; plus abstracts of the 19 Poster Session presentations. In addition, full transcripts are printed of the presentation on computerizing the United States Medical Licensing Examination, and the Point/Counterpoint Debate on Centralized vs. Departmentalized Governance of the medical curriculum. Watch for further announcements of this important addition to your personal library, in this publication and posted on the IAMSE Website (http://www.usd.edu/IAMSE).*

INTERNATIONAL PERSPECTIVE

ROGER W. KOMENT, PH.D.

If we look at the history of medical education within the United States and Canada, it becomes clear that the seminal changes which occurred as a result of Abraham Flexner's famous report [1] were strongly influenced by the systems of other countries. Men of learning in the mid- to late 1800s flocked to the universities of Austria, France, and especially Germany, to study science and medicine. Upon their return, they, and their subsequent students, began to significantly influence the educational systems of North America. Many regard Germany as the birthplace of the "scientific method" in medical education, and among those to assist in the delivery were famous scientists such as Robert Koch, Rudolph Virchow, and Paul Ehrlich. Here, microbiology, pathology, materia medica (pharmacology) and other disciplines were for the first time being defined as "the sciences basic to medicine". But all was not perfect. Even Flexner, in his comparison of medical education in Europe and the United States, noted that medical education in Germany was becoming more dominated by theoretical lectures. Patient contact and the integration of science and medical practice were, as he saw it, largely neglected.

Now , almost 100 years later, it seems an appropriate time to revisit the medical education system which was once so influential to North America. The author we have invited to accomplish this task is Dr. Wolfram Antepohl, who himself recently received an insider's view by obtaining his medical degree from the Christian Albrecht University in Kiel, Germany. Dr. Antepohl is now on staff at the University of Cologne, where currently he is implementing a Problem-Based Learning Curriculum in Pharmacology, one of the first such programs in Germany. We are proud that he is also a member of the IAMSE Board of Directors.

1. Flexner, A. *1910. Medical Education in the United States and Canada: A Report to the Carnegie Foundation for the Advancement of Teaching.*

MEDICAL EDUCATION IN GERMANY

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Institutions of Medical Education

Altogether, Germany has 35 medical schools, most of them part of large universities. Only one medical faculty (school) belongs to a private university, the University of Witten-Herdecke. On average, German medical schools have an acceptance rate of 288 medical students per school per year (1993). The total number of entering medical students in 1993/94 was 10,148. Differences between the medical schools concerning their curricula are not great, as the content and format are largely regulated by the State. Thus, German medical schools have few possibilities to develop their own profile. The freedom left within the medical schools, e.g., concerning additional electives, educational approach, and internal assessment, is often used very differently by the departments of any one medical school. Due to the department-oriented structure of German universities, it is often they who are responsible for "their" subjects in contrast to a more centralized structure where the entire faculty is responsible for curriculum design. It is thus possible that a course in one of the basic sciences becomes rather dominant over other subjects in one medical school, while in another, that same course plays hardly any role at all. At the same time, course quality within one medical faculty might vary greatly according to the dedication and creativity of staff from different departments.

The Present Curriculum

Medical education in Germany, in contrast to other university education, falls under the responsibility of the federal government and parliament. Its framework is defined in the *Approbationsordnung* (Medical Licensure Regulation), which was last changed in 1989. A new major revision is under discussion now and is expected to be

implemented in 1998 (see below). The medical curriculum in Germany is scheduled for a minimum duration of six years and three months or, in terms of hours, a minimum of 5,500 hours (as regulated in European Union law). It largely follows the traditional vertical (preclinical-clinical) and horizontal (by subject) subdivision and is divided into four semesters of preclinical education, two semesters of propedeutic clinical education, four semesters of course- and lecture-based clinical education, and a final practical year (see Table 1). It is important to note that, unlike in the United States for example, the big "division line" in German medical education so far still is drawn between "preclinical" and "clinical" sciences, with pathology and pharmacology being counted among the (so-called theoretical) clinical subjects. This may, however, change with the next revision of the *Approbationsordnung*.

The preclinical semesters cover biology, chemistry, and physics (there is no premedical education in Germany), as well as the "classical" preclinical subjects of anatomy, biochemistry, and physiology. Furthermore, medical psychology and sociology are taught. In 1989, additional clinically-oriented seminars were introduced in anatomy, biochemistry, and physiology, in an attempt to bridge the gap between the clinical and the preclinical part of the curriculum. Teaching in the preclinical section occurs in lectures, practical courses where, for example, dissection and microscopy are taught, and in seminars where clinical aspects should be discussed in smaller groups of about 20 students. Subjects are mostly taught in parallel, i.e., lectures and courses in different subjects would take place on the same day. That is, a second-year class might for example one day spend two hours in a dissection course early in the morning, followed by two hours of biochemistry and physiology lessons. The afternoon might take them to the department of biochemistry for four hours of laboratory practice. Their schedule for the next day might start with lessons in anatomy, and so forth. Some medical faculties or departments however, have meanwhile switched to teaching at least part of the syllabus in blocks, meaning that, for example, the first six weeks of a semester might be dedicated to anatomy lectures in the mornings and a dissection course in the afternoons, while the last eight weeks would be dedicated mainly to physiology.

Teaching in the preclinical section occurs in lectures, practical courses where for example, dissection and microscopy are taught, and in seminars where clinical aspects should be discussed in smaller groups of about 20 students.

The two preclinical years are followed by one year in which propedeutic elements, such as general physical examination and history taking, together with basic clinical-theoretical subjects, e.g., basic pharmacology, general pathology, and microbiology dominate. The lecture and course format is still most common here, but first patient contact eventually takes place in the course of clinical examination. In the fourth and fifth clinical year, "real" clinical subjects such as internal medicine, surgery, etc. are taught, together with further theoretical subjects like clinical pharmacology and pathology or social and industrial medicine. Even here lectures stand for a large share of the time table. "Practical" teaching in the clinical subjects takes place in small groups of between three and eight (sometimes even more) students. The course of internal medicine for example, may consist of three hours per week for one semester, during which the small groups meet patients on wards and try to examine and discuss them together with a physician.

The sixth year, known as the practical year *(Praktisches Jahr)*, does not consist of semesters, but rather is divided into three blocks of sixteen weeks each. Students in this final year do one subject per block: internal medicine, surgery, and an elective clinical subject. During these blocks, the students ideally work as part of the medical team in university or teaching hospitals. Under the supervision of physicians, they are expected to train clinical skills, as well as clinical thinking and decision making. After their graduation, young physicians in Germany must complete an additional internship (preregistration period, house officership) to become fully licensed.

Student Assessment

Basically, there are two different levels of assessment in German medical education. On the one hand, the departments usually perform in-course assessment, meaning they administer different kinds of exams (orals, practical exams, essays, MCQs...), during or after the courses for which they are responsible. Students must pass these exams in order to finish the course and receive a course certificate.

The second level of assessment in medical education is regulated by the government. The so-called State Exam (similar to the United States Medical Licensing Exam) is divided into four steps, one after each section of the curriculum.

The preclinical exam after the first two years is called *Physikum*, the exams after the other (clinical) sections are referred to as Step One (after the third year of the curriculum), Two (after the fifth year), and Three (after the sixth year) of the State Exam. To be admitted to these exams, students must have certificates from all departments in the section concerned, that is, they must have successfully passed all courses. The various steps have different elements: MCQs (multiple choice questions), oral, and practical examinations. While the *Physikum* consists of both MCQs (2/3 of the grade) and an oral part (1/3 of the grade), Step One only contains MCQs. Step Two again has MCQs and an oral examination, while Step Three only consists of a combined practical and oral part with no MCQs at all. The final grade for the graduate is a combined practical and oral part with no MCQs

at all. The final grade for the graduate is a combination of the grades in all three steps.

The assessment method in Germany has been subject to major discussion. While it is undoubted that the MCQs are a very objective means of examination, more and more individuals doubt whether centrally produced MCQs are a valid instrument to measure a student's qualification to be a physician. Many students in preparing for the State Exams simply memorize questions and answers from old tests (which are published!) that are likely to reappear in one form or another on this licensure exam. On the other hand, the Federal Institute for Medical Exams attempts to reduce repetitions and thus their questions have become more specific; although they often seem far from the common ground of relevant medical knowledge. The coming revision of the *Approbationsordnung* (Medical Licensure Regulation) is thus also expected to contain changes in the examination procedures (see below).

Research in the Medical Curriculum

Research is not an obligatory part of medical education in Germany. Unlike the Anglo-American system, graduation from a medical faculty in Germany does not automatically confer the title of M.D.; although most students (about 70%) do a research project and write a thesis voluntarily in order to obtain this academic title. In principle, their research might range from a literature study to a three-year laboratory project. Some students do completely devote one or more semesters to the conduct of research, while others attempt to do it concurrently with their normal course of studies. Research merits, similar to graduation marks, have become a factor in the search for jobs, since unemployment is a recent problem for newly graduated physicians in Germany.

Application and Admission

With the number of applicants having declined over the last years (from 4.3 applicants per place in 1993 to 2.1 in 1996/97), rules for admission to medical education in Germany have recently been changed. Until the fall of 1996 there had been a central admission test, the results of which were combined with those of the secondary school degrees. But the government has recently implemented a new (which, in fact, is a very old) system. That is, 60% of the positions in medical schools will be allocated to applicants with the best grades from secondary school, while the remaining 40% of the places will be distributed according to a waiting list. Thus, medical schools have no influence on the selection of their students.

The Reform Discussion and Expected Reforms within the next years of medical education in Germany has been criticized from different sides and for various reasons throughout recent years. Major points of criticism are:

- lack of practical, patient-oriented training
- lack of both horizontal and vertical integration
- too much emphasis on more and more factual knowledge
- too little emphasis on global understanding
- antiquated teaching methods instead of more modern approaches such as problem-based and self-directed learning
- invalid assessment methods
- too much central regulation

Discussion regarding necessary reforms has thus been ongoing for quite some time. However, proposed initiatives have often been stalled because of the rigidity of the centralized system which does not permit much latitude for local experiments. Similarly, major reform at the national level was not achieved either, partly because of resistance from various lobby groups. Instead, small half-hearted programs were introduced, that would not harm anyone. Consequently, their positive effects were very limited as well. Only in the middle of the 1980s did a completely different curriculum take shape in the private medical school of Witten-Herdecke, initiated by the school's medical students and inspired by successful curricular reforms in other European countries and North America. Still, even Witten-Herdecke was limited by a number of federal regulations, especially concerning the centrally regulated student assessment system.

Horizontally integrated teaching will soon become obligatory.

Conclusions

The experiences from Witten-Herdecke, a number of smaller reform initiatives in other medical schools, and the growing pressure from students, politicians, and the public, helped to create an atmosphere in Germany that is now more open to reform. A new change in the federal *Approbationsordnung* (Medical Licensure Regulation) that is expected in 1998, will probably allow, for the first time, the implementation of experimental new curricula on a larger scale (plans exist, e.g., in Berlin and Munich). Furthermore, new learning methods, such as problem-based learning, are now appearing in the German curriculum, and integration is growing in importance. Horizontally integrated teaching will soon become obligatory. Clinical aspects will play a stronger role even in the first years, and the preclinical and first clinical phase will be joined together as one phase comprising the first five semesters. In all steps of the state exam, MCQs will be given less importance, while the weight of the oral and practical parts of the exam will be increased. Individual universities will have more possibilities to influence the MCQ questions. Concerning the clinical part, block courses and longer clinical attachments will be introduced. Finally, the number of admissions to medical schools will be reduced by 20% (i.e., from more than 10,000 students per year to about 8,000).

Even though the reforms now initiated by the federal government may be considered half-hearted and insufficient, they will at least sup-

ply those faculties willing to implement change with a chance to do so. Traditionalists might still be able to hide behind the new law, but for those ready to try a step towards the future, a new gate might open at last.

Table 1. Medical Education in Germany — The Standard Curriculum as Defined by Federal Licensure Regulation *(Approbationsordnung)*

DURATION	EDUCATION	EXAMINATION
4 years	**Primary School**	
9 (8*) years	**Secondary School (*Gymnasium*)**	final examination (*Abitur*) for general university admission, special test for admission to medical studies.
2 years (first and second academic year)	**Preclinical Section:** physics, chemistry, biology, physiology, biochemistry, anatomy, sociology, psychology, terminology; two months of nursing service (can be done before university studies	in-course assessment premedical exam (*Physikum*): 320 nation-wide MCQs over two days; oral in two subjects
1 year (third academic year)	**First Clinical Section:** general pathology, general pharmacology and toxicology, microbiology and immunology, clinical chemistry and hematology, radiology, general physical examination and history taking, emergency cases and first medical aid, biometric methods, human genetics, history of medicine	in-course assessment Step One of medical state exam (*Erstes Staatsexamen*): 280 nation-wide MCQs over two days
2 years (fourth and fifth academic year)	**Second Clinical Section:** special pathology, special pharmacology, internal medicine, pediatrics, dermatology and venerology, surgery, orthopedics, urology, gynecology and obstetrics, ophthalmology, ENT, neurology, psychiatry, psychosomatic medicine and psychotherapy, emergency medicine, family medicine, ecological course (hygiene, industrial medicine, social medicine, forensic medicine) 4 months of clerkships during semester holidays (can even be started in the first clinical section).	in-course assessment Step Two of medical state exam (*Zweites Staatsexamen*):580 nation-wide MCQs over four days;
1 year (sixth academic year)	**Third Clinical Section, Practical Year (*Praktisches Jahr*)** clinical attachments in surgery, internal medicine, and one elective subject; 16 weeks each in university hospitals or academic teaching hospitals	Step Three of medical state exam: oral and practical in the three subjects of the final year plus additional subject
1.5 years	**Internship/House Officer/Pre-Registration Period (*Arzt im Praktikum*)**: supervised practical work in hospital or practice practice.	no examination
4-6 years	specialization in one of 46 specialties and subspecialties	specialist exam

*in the East German states of Mecklenburg-Western Pommerania, Saxony, Saxony-Anhalt, and Thuringia

Card Games and Role Play: Strategies for Large Group and Small Group Teaching

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Introduction

In 1994, in Manchester a new problem-based curriculum was introduced, and suddenly working clinical physicians were faced with teaching medicine in a totally different manner. In view of this seismic change in our teaching lives we decided to experiment with our own variation on problem-based learning (PBL), and this paper describes our initial results.

Background

Problem solving, both individually and as part of a team, is the cornerstone activity of clinical medicine. In the recommendation on undergraduate medical education *Tomorrow's Doctors* (December 1993), the General Medical Council of the United Kingdom recognizes that one of the desirable attributes of an independent practitioner is the ability to solve clinical problems in medical practice by reasoning and judgement in the application of knowledge to the analysis and interpretation of data.

Diagnosis of a clinical condition involves two different skills: Reasoning from biological theory, and reasoning from past experience. The latter comes with time spent in clinical medicine but the former can be taught. Given the task of teaching problem solving in respiratory medicine to 100 third-year medical students in 60 minutes, we have developed a novel method which both motivates and instructs the students. Working as defined members of a team and using a system of request cards the students are encouraged to use the theoretical knowledge they have acquired in their first two pre-clinical years to synthesize and examine diagnostic hypotheses in a non-threatening environment where constructive feedback is possible.

Given the task of teaching problem solving in respiratory medicine to 100 third year medical students in 60 minutes, we have developed a novel method which both motivates and instructs the students.

Example Clinical Scenario

Brian Hargreaves, aged 64, was referred to you from the vascular surgical unit. He had been admitted the previous day for a carotid endarterectomy. As part of the routine work-up he was sent a CXR and while in X-ray apparently collapsed. On interviewing the patient, who is now comfortable in bed on the ward, you learn that he has had hypertension which for many years had been difficult to control, and that for this he is taking atenolol, captopril, nifedipine, and fursemide, with potassium supplements. He also tells you that about a year ago he began to experience numbness and weakness in his right arm and hand. These symptoms have been thought to be due to TIAs and a probable small stroke. This problem has gotten worse, and more recently he began noticing a toothache type of pain in this arm. He also mentions that he has developed pain and marked tenderness in his wrists and ankles. The latter have become swollen. His GP has treated this with increased diuretics and naproxen, but with no effect.

Since coming into the hospital he has started to feel rather dizzy when he stands up and his collapse in X-ray was precipitated by being asked to stand to have the film taken. There was no loss or alteration of consciousness. The rest of the interview does not reveal any problem with the other systems apart from a smoker's cough with sputum production. He smokes 10 cigarettes/day and drinks 6 pints of lager/week. On examination he is lying comfortably in bed. Two things strike you. The first is that there is asymmetry of his face, and the second is that his fingers look rather bulbous*. There is tenderness of his wrists* and swelling and tenderness of his ankles.* He has a left carotid and a right femoral bruit. His BP is 90/50 and drops to 70 systolic on standing accompanied by severe dizziness. His cardiovascular, respiratory and abdominal systems are otherwise normal. Fundoscopy is abnormal.* His other cranial nerves are normal. In his peripheral nervous system, examination of his legs is normal, but in the arms there is weakness and wasting of the small muscles of the right hand and pain and sensory loss affecting the medial border of the right forearm and hand. The full blood count is normal but the electrolytes show:

K	6.7 mmol/l
urea	15.3 mmol/l
creatinine	μmol/l

There is 1+ protein in his urine. The ECG* is reported as abnormal. Fortunately, despite the collapse, the patient did have a CXR* and an X-ray of his feet* and ankles. Sputum cytology was performed.* A bronchoscopy did not reveal any endobronchial lesions. A CT scan was performed.*

DIRECTIONS: Working as a team in the roles assigned deduce the underlying scenario and formulate a working hypothesis/diagnosis. For each starred (*) item there is either a clinical photograph or an X-ray. See Figure 1.

The Session

Students are split into groups/teams of seven and each given the same clinical problem. These clinical scenarios are based on a composite of actual cases seen by TER and AMH and suitable real life "red herrings" are included. Each student is equipped with a team work pack, which contains the aims for the particular session, the advantages of good and not so good teams, their particular team role with an explanation of that role, the clinical scenario, and the students session evaluation sheet. The team roles given to each member of the group are derived from work by Belbin and are shown in Table 1. During the course of the year, the students remain in the same teams and rotate through all the roles so they may experience the different ways in which members can contribute to its smooth running and success.

Table 1. Student Team Roles

Chairperson/Coordinator
Innovator x 2
Resource Investigator x 2
Monitor/Evaluator
Completer/Finisher

Each student group has four cards which they can surrender in exchange for pieces of information. Each card may only be used once. Employing team roles can be very useful for inexperienced PBL tutors, such as ourselves, where within a group particular students become dominant and others tend to be marginalized.

The Cards

1. Library This card gives a limited amount of time during which the student can use the resource library provided.

2. Oracle This card can be used to "consult" a medical expert in any specialty of the students choice to obtain specialist information about a condition.

3. Information This card can be used to obtain further information by requesting investigations or further clinical details not already available from the scenario.

4. Rescue If the students become hopelessly bogged down or lost, playing this card entitles them to some direction from a tutor to get them back on the correct track.

The students are encouraged to initially brainstorm the scenario trying to identify the important areas to explore. Then they are asked to formulate diagnostic possibilities and to organize a hierarchy of information they require to test these hypotheses. Some students in the group are given the task of obtaining this information using the appropriate card or cards. They report back and the whole group reappraises the diagnosis(es) in light of this new information until finally a working diagnostic hypothesis is constructed. Each small group then reports back to the whole student body.

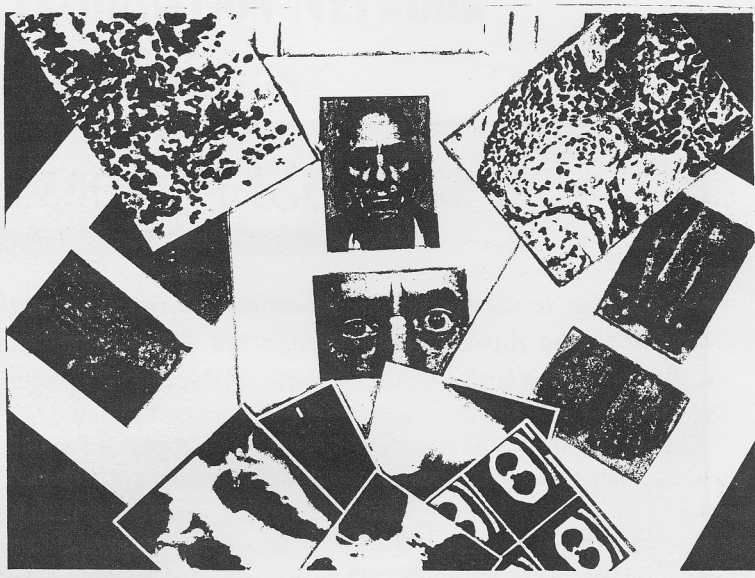

Figure 1. Visual Materials for Clinical Scenario

A tutor is shared between 2-3 groups and at the end of the session is able to give feedback on the group as a whole and their methods of deductive reasoning and also provide individual students with feedback on their personal contribution to the session and their interactions within the group. At the end of the session the students complete an evaluation questionnaire.

After two years of experimenting with this model as an adjunct to the teaching of problem solving, we feel that this type of approach can

help students adopt a team management approach and organize a logical and hierarchical approach to the care of patients.

Assessment by Students

At the end of each session the students are provided also with a form with which to give an anonymous assessment of the session and the tutor. Obviously, these are very subjective, but they have been very encour-aging, as has attendance at the session (about 90-95%).

Table 2. Comparison of Techniques for Teaching Problem Solving Skills (in percent)

	Previous Technique	Current Technique
Very Good	16	62
Good	65	30
Average	19	8

Conclusions

The way in which we teach our undergraduates is undergoing revolutionary change, and rightly so. However, in addition to the serious aspects of change, we would encourage that new methods of learning should be fun as well as instructive.

BSEF Global Memberships†

Prior to its evolution to become the International Association of Medical Science Educators, membership in the Basic Science Education Forum had increased to represent individual faculty members from medical universities, schools, and institutes geographically distributed throughout 87 countries of the world.

Argentina
Australia
Austria
Azerbaijan
Bahrain
Bangladesh
Belgium
Bolivia
Brazil
Bulgaria
Canada
Chile
China
Colombia
Costa Rica
Croatia
Czech Republic
Denmark
Dominica
Ecuador
Egypt
England
Ethiopia
Finland
France
Georgia
Ghana
Germany
Grenada
Greece
Hungary
India
Indonesia
Ireland
Israel
Italy
Japan
Jordan
Kenya
Korea
Laos
Latvia
Lebanon
Macedonia
Malaysia
Mexico
Mongolia
Mozambique
Netherlands
New Zealand
Nicaragua
Nigeria
Norway
Pakistan
Panama
Peru
Philippines
Poland
Portugal
Romania
Russia
Saudi Arabia
Scotland
Singapore
Slovakia
Slovenia
South Africa
Spain
Sri Lanka
Sudan
Sweden
Switzerland
Syria
Taiwan
Tanzania
Thailand
Trinidad
Tunisia
Turkey
Uganda
Ukraine
U.A. Emirates
United States
Venezuela
Vietnam
Yugoslavia
Zimbabwe

† *As of June, 1997*

It was June of 1996. Plans for reorganization of the Basic Science Education Forum into what now is the International Association of Medical Science Educators (IAMSE) had barely entered the discussion phase. Yet an abstract (see below) describing an ambitious goal was submitted to the AAMC for presentation at that year's annual Innovations in Medical Education Exhibits.

In the year to follow (1997), the BSEF would reach its zenith, having spread a message of sharing information — faculty member to faculty member — into medical universities, schools, and institutes of 87 countries of the world (see p. 24). Individuals from 85 of these countries beyond North America had been attracted to the BSEF in less than 4 years time (1993-1997)! Such overwhelming response amply demonstrated the need for honest and trustworthy communication on a global scale which crossed all medical science disciplines.

Today, under the new banner of the International Association of Medical Science Educators, we continue to work toward a goal of worldwide communication. IAMSE intends to reach all individual teaching faculty to provide them a reliable resource of useful information. Our message of freely sharing information on current and innovative instructional techniques provides a viable means to promote faculty development in a credible fashion. Our overall goal remains to collectively create physicians, appropriately trained in the sciences and the scientific method, for the practice of medicine in the 21st Century.

Evolution of a Global Information Network for Basic Science Education

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In a hotel meeting room in downtown Chicago, a few individuals gathered to discuss change in medical education and its inevitable impact on the basic sciences. Traditionally, these have been defined as Anatomy, Behavioral Science, Biochemistry, Microbiology, Pathology, Pharmacology, and Physiology. The year was 1988, and it witnessed the birth of the first Special Interest Group (SIG) of the AAMC Group on Educational Affairs (GEA). Since that time the Basic Science Education SIG has expanded to include basic science (and clinical) faculty members and staff representing every medical school under AAMC jurisdiction! Our purpose was not to thwart change in medical education, but rather to educate ourselves as to the issues involved, refine our own experiments in teaching, and become knowledgeable mediators of change. The ultimate intent is for faculty to assume leadership roles within our disciplines for teaching these fundamental sciences of medicine in the 21st Century. Four Regional SIG Chapters serve their constituency contributing to this goal, each led by an elected Regional SIG Convener (WG, PH, GR, and MS).

Integral to the success of SIG goals was development of methods for communication between members. The first venue was the creation in 1991 of our semi-annual publication, now titled the *Basic Science Educator,* which encouraged exchange of opinions, reported current developments in medical education, and included original articles on teaching and learning the fundamental sciences. The next year witnessed planning of a three-day conference for 1993 — by faculty, for faculty — on *New Educational Strategies for the Basic Sciences,* to provide further opportunity for communication and information exchange.

It was in 1993 that the Basic Science Education Forum (BSEF) was created as an independent offshoot of this SIG in response to requests to participate from faculty abroad. The Conveners of the AAMC-GEA Regional SIGs were invited to also take on the job of becoming the first Regional Directors of the BSEF, which constituted its Executive Committee. From that time to the present, individuals from medical schools around the world have continued to seek participation in our fundamental activity of sharing information. By 1994 we had developed an Internet Listserv, termed MICRONET, to meet the rising demand for the means to communicate. MICRONET is a valuable and growing resource of both SIG and BSEF, and all professionals are invited to join (send an e-mail to mailserv@slu.edu "subscribe micronet yourname").

Combined membership in SIG and BSEF has grown to nearly 2,000 individuals from medical facilities in 54 countries of the world. Twice yearly all receive the *Basic Science Educator,* all are invited to join in discussions over MICRONET; and all may participate in the Biennial

International BSEF Conferences. But this year will witness the beginning of our most ambitious project in communication to date: the establishment of BSEF Regional Offices abroad, each staffed by a Regional Director for his/her country. Within seven years, every country will be electronically linked together through their Regional Office in a global information network for the purpose of reaching all faculty responsible for teaching the basic sciences. Six countries have agreed to participate, and members in another four are negotiating with their Deans or Rectors.

IAMSE intends to reach all individual teaching faculty to provide them a reliable resource of useful information.

The world in the 21st Century will be defined by its ability to access and process information. The Basic Science Education SIG and the Basic Science Education Forum intend to see that all faculty, in the United States, Canada, and around the world, have access to the most current information on teaching the fundamental sciences of medicine. Through collegial interactions we will produce better physicians for the future, firmly grounded in the sciences.

TRANSITIONS

W. Marshall Anderson, Ph.D., Professor of Biochemistry and Molecular Biology at Indiana University Northwest Center for Medical Education, has been appointed to the Editorial Board of the *Basic Science Educator.* He replaces Michael Schmidt, Ph.D., as Associate Editor for the column *Computer Applications in Basic Science Education.*

Penny Hansen, Ph.D., Professor of Physiology at Memorial University of Newfoundland Faculty of Medicine, has resigned as Convener of the Northeast Regional Chapter of the AAMC-GEA Special Interest Group on Basic Science Education after serving a very successful three-year term.

Wayne North of Pharmacia-Upjohn was honored by the Basic Science Education Forum (BSEF) on the occasion of his retirement from the company. He was presented with a plaque which read "The Basic Science Education Forum Proudly Recognizes Wayne K. North as a Loyal Friend and Supporter, 1988-1996." During those years as a Medical Sciences Educational Liaison for the Upjohn Company, Wayne was instrumental in securing funds for many BSEF projects.

Murray Saffran, Ph.D., Professor of Biochemistry and Assistant Dean for Medical Education at the Medical College of Ohio, has resigned as Convener of the Central Regional Chapter of the AAMC-GEA Special Interest Group on Basic Science Education after serving a very successful four-year term.

Gabriel Virella, M.D., Ph.D., Professor and Vice Chair of Microbiology & Immunology at the Medical University of South Carolina, has resigned as Editor-in-Chief of the *Basic Science Educator* after serving for three years and producing six issues. We thank him for his organizational skills, for many provocative editorials, and for setting the professional direction for our publication.

ASSOCIATIONS INTERNATIONAL, INC. AND THE IAMSE MANAGEMENT TEAM

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Association Management: not exactly the words to conjure up a daring, adventurous profession like oil-rigging on the North Sea or doing something as vital as Emergency Medicine. But association management *is* vital to those who lead non-profit organizations on a voluntary basis. As an association management company, we provide shared office space, equipment, personnel, and knowledge to multiple associations. That produces a cost-effective situation — significantly lower costs than associations providing their own in-house staff, and a significantly higher experience level in association management. Believing wholeheartedly in its goals, Associations International, Inc. (AI) is proud and delighted that the International Association of Medical Science Educators (IAMSE) has selected us to serve as your headquarters and to provide administrative support.

AI was incorporated in the Commonwealth of Virginia in 1975. Over the past 22 years, we have worked with dozens of organizations and have gained a wealth of knowledge and experience which we gladly share with IAMSE. Our clients have been primarily in the fields of scientific societies and university alumni organizations. We also have clients in the recreational field and in animal care. IAMSE's arrangement with AI covers three general areas of service:

1. HEADQUARTERS We serve as IAMSE's headquarters; receive and respond to mail, fax, E-mail, and telephone calls; process mailings; maintain files; and assist in developing long-range goals and plans.

2. MEMBERSHIP We maintain IAMSE's membership records; collect dues and process memberships; recruit new members; send new member packages; create and distribute membership brochures; provide summary membership statistics; and generate membership lists and labels.

3. FINANCIAL We maintain all IAMSE's financial records; deposit all income; prepare checks for the Treasurer's signature; assist in the development of the annual budget; produce monthly and quarterly financial statements; and prepare monthly, quarterly, and annual federal, state, and local tax returns and reports.

In addition to the above tasks, AI has performed many other services for IAMSE. These include facilitating the incorporation of IAMSE in the Commonwealth of Virginia; obtaining IAMSE's federal employer identification number from the Internal Revenue Service; drafting initial Bylaws documents and advising the Board in matters of their refinement; facilitating logistical arrangements for Board of Directors meetings and providing oral and written reports; facilitating the design of a more professional look for the *Basic Science Educator,* and working to secure IAMSE's 501(c)(3) tax exempt (grant eligible) status. In continuous contact with IAMSE's President, Dr. Roger Koment, by phone, fax, and E-mail, AI provides guidance on a myriad of organizational matters. In the future, we expect to assist with conferences, publications, grant preparation, and other activities.

A firm believer in bigger is not necessarily better, AI is a small, compact, efficient management machine. The three key players share the duties each association presents, with each taking on his or her specialty; and wear many different hats throughout the course of our day.

Dr. Armand B. Weiss, AI's President and Founder, is the primary point of contact for IAMSE and handles all the financial management, meetings, and Board relations. He received his B.S. in Economics and M.B.A. from the number one business school in the nation, the Wharton School of the University of Pennsylvania, and a D.B.A. from George Washington University. A Certified Association Executive (CAE), he has been active in association management for over 30 years. He has been president of many organizations, and founding editor of the largest circulation publication in the world in the fields of operations research and management sciences. He is a Fellow of the AAAS, past president of the Washington Academy of Sciences, and is listed in current issues of *Who's Who in the World, Who's Who in America, Who's Who in Science and Engineering,* and other references.

Vice President Jo Ann Weiss's forte is publications: writing, editing, producing, designing, and managing. Each association has membership flyers, brochures, newsletters, proceedings, and directories, and it is her task to keep information flowing.

Jo Ann holds a B.A. in Political Science and a Publications Specialist Certificate from George Washington University. She has more than 20 years experience in data management, publications, and office management.

Jennifer McLellan, Database Manager for AI, keeps each group's database up-to-date and running. She produces reports and labels, adds and deletes membership records, and keeps track of membership dues. She is our mailing manager and is also one of the courteous voices on the other end of the phone when you call IAMSE's business number with your membership or other inquiries. Jennifer has course work in computer science and holds a Certificate in Information Systems. She has been with AI for five years. Previously, she was a computer/equipment operator and production controller with another company.

As an association management company, we provide shared office space, equipment, personnel, and knowledge to multiple associations.

As IAMSE's management team, we are on the "front line." We are the people who receive and answer your calls and letters, process your dues payments, remind you ever-so-sweetly to pay your dues, produce and distribute the *Basic Science Educator,* help plan your meetings, and just offer support in any way we are asked. As an IAMSE member, we wanted you to know that Associations International, Inc. is actively involved in realizing the dream of making IAMSE the leading association in the world for the educational, technical, and psychological support of medical science educators.

We look forward to helping IAMSE grow and achieve its goals.

ANNOUNCEMENT

ECFMG INTERNATIONAL FELLOWSHIPS IN MEDICAL EDUCATION 1998-99

The Educational Commission for Foreign Medical Graduates (ECFMG) announces the 1998-99 Application Cycle for the INTERNATIONAL FELLOWSHIPS IN MEDICAL EDUCATION, a program for medical scholars from abroad to study medical education in the United States. In keeping with ECFMG's aim of promoting excellence in international medical education and the convergence of the goals and objectives of the Foreign Faculty Fellowship Program and the International Medical Scholars Program, a decision was made to consolidate the two programs into one beginning with the 1997 program year. The new program, International Fellowships in Medical Education (IFME), will continue to provide opportunities for faculty members from schools of medicine outside the United States to study aspects of medical education in the United States that have the potential to improve medical education in their home country institutions and departments. The fellowship program also invites applications from individuals who are working on the integration of medical education and health care services in their home countries.

Program

Approximately 20 fellowships will be awarded annually. Mentoring will be provided by preceptors in U.S. basic and clinical science departments, medical education departments, and health system institutions. Eligible areas of study include: educational methodology; curriculum design; evaluation systems; medical school governance; development of basic and clinical science departments; and the design and operation of medical education programs linked to the health care service systems of the home country. Under this program, fellowships are not provided for any of the following: programs in basic or clinical research; degree-granting educational programs that require acceptance to an institution and tuition payments; tuition grants for short-term courses; specialty training in residency programs; or training solely in clinical procedures. ECFMG screens applications, matches approved candidates with appropriate U.S. faculty mentors, and provides formal recognition for the educational program upon its completion. Priorities and program emphasis may change periodically. Program priorities for the 1998-99 program year will be announced in January 1998. Candidates for this program must:

- reside and work in their home countries at the time of application;

- have a graduate or professional degree in medicine or in a basic medical science that is taught in a medical education setting, or a professional degree in public health or health administration;
- have not less than three years of work experience in their chosen field in the home country following completion of their formal academic and clinical training;
- hold an academic appointment as a faculty member in a school of medicine if in a medical education setting, or hold a position linked to medical education if in a health services setting;
- have the ability to communicate effectively in the English language, as determined by having passed either the ECFMG English test or the Test of English as a Foreign Language (TOEFL), or by meeting other criteria acceptable to ECFMG;
- have the endorsement of a home country medical school, organization, or institution for the proposed educational program, and have a position to return to in the home country medical school, organization, or institution upon completion of the fellowship.

Duration of Programs

The duration of the educational programs varies, depending on the approved program. Programs range in length from six months to one year. Fellowships are limited to a maximum stay of one year.

Home Country Endorsement

Individual applications must have the endorsement of an institution or agency in the home country. Endorsing institutions abroad may be schools of medicine, postgraduate institutes, or ministries of health or education. Other qualified sponsors will be considered and requests will be reviewed and accepted on merit. Candidates and endorsing home country institutions are expected to certify that candidates will return to the organization or institution of origin or to a position that has been designated for them upon their return. It is important to note that only one application can be accepted for review from each home country endorsing institution.

United States Host Institutions

United States institutions that host fellows must have an academic administrative unit responsible for accepting fellows; must arrange their educational programs; and must ensure that appropriate supervision is provided. Host institutions are asked to submit a program plan for the fellow. Although most applications originate in the home country without a designated U.S. sponsor, the IFME accepts applications for which a U.S. institution has expressed interest in the candidate. However, all applications are subject to the same review process and require the same assurance regarding the availability of a position in the home country upon completion of the fellowship.

Procedure

Applications are mailed in response to requests beginning in January of each program year. A complete application consists of three parts. Part I, completed by the candidate, and Part II, completed by the endorsing home country institution, must be submitted by the candidate directly to ECFMG by August 15. Part III of the application is sent by ECFMG to the U.S. host institution for completion.

Candidates are responsible for submitting Reference Report forms from two individuals chosen to provide references for the candidate.

Application Review Process

ECFMG staff screens applications to make sure they are filled out completely and for basic eligibility of candidates. A Scientific Review Panel reviews eligible applications and makes recommendations for awards. In reviewing applications and making awards, consideration is given to the following:

- professional qualifications of the candidate;
- appropriateness of the educational programs proposed by the candidate and the endorsing home country institution;
- the home country endorsing institutions plans for utilizing the benefits of the fellowship to meet identified needs;
- assessment of the overall value of the fellowship experience to the candidate, the home country institution, and the home country.

Financial Allowances

Fellowship allowances generally include a monthly stipend of $2,200; round trip economy class air fare for the fellow only; and travel to one scientific meeting in the U.S., as appropriate. In addition, the program provides health insurance for the fellow and accompanying family members. The only allowance for dependents is health insurance coverage.

Timetable

August: Applications — Parts I and II are due at ECFMG by August 15.

August: The two Reference Reports are due at ECFMG by August 15.

November/December: Review of applications by Scientific Review Panel.

January-April: Placements obtained in U.S. host institutions for selected fellows.

May: Awards announced. Programs must begin within one year of award announcement date.

Requests For Applications

Application materials for the 1998-99 IFME application cycle may be obtained after January 1, 1998 by written or phone request from:

ECFMG/International Fellowships in Medical Education
2401 Pennsylvania Avenue, N.W., Suite 475
Washington, DC 20037, U.S.A.
TEL: (+) 1-202-293-9320
FAX: (+) 1-202-457-0751

The Medical Educator's Resource Guide

Roger Koment, Ph.D., IAMSE President

It is an an undisputable fact that computers and computer telecommunications have forever changed the course of medicine and medical education. The way we, as medical faculty, conduct our daily work and the methods we use to teach our disciplines are continually influenced by advances in computer technology. And this influence will only increase with time. The recent advent of the World Wide Web (WWW) as a resource for supplementing course materials and promoting active student learning has opened an entirely new dimension of possibilities.

In keeping with our mission, the International Association of Medical Science Educators is pleased to provide this Resource Guide to valuable educational sites on the World Wide Web. Such an address is referred to as a URL, or Uniform Resource Locator, and anyone who has done so knows that a huge amount of time is easily consumed by the activity of searching and evaluating such sites. Much duplication of effort can be avoided if we simply share what each of us has found. We encourage submission of URLs deemed of value for the teaching of medical sciences, or in some other fashion of interest to medical faculty. These will be published in subsequent issues of the Basic Science Educator *with contributors' names listed as below. Also, look on our website for this feature with live "hotlinks" to each URL listed. You can find us at www.usd.edu/IAMSE. (N.B. Please remember that URLs are case sensitive and should be entered exactly as written.)*

The URL submissions which follow are credited to Michael Altman, M.D. (Northwestern University), W. Marshall Anderson, Ph.D. (Indiana University), Olga Artamonova (BSEF Eastern European Correspondent), Deborah Griffith (Southern Illinois University), Richard Kriebel, Ph.D. (Philadelphia College of Osteopathic Medicine), Thomas Langworthy, Ph.D. (University of South Dakota), David Penney, Ph.D. (Wayne State University), and Roger Koment, Ph.D. (IAMSE President), Send URLs with any comments for usage to Roger Koment, Ph.D., at the address listed on the inside front cover of this publication.

GENERAL

Center for Instructional Support	http://www.uchsc.edu/CIS
The Interactive Medical Student Lounge	http://falcon.cc.ukans.edu.edu:80/~sween
The Interactive Patient	http://medicus.marshall.edu/medicus.html
The Medical Education Page	http://www.scomm.net/~greg/med-ed
The Virtual Hospital	http://indy.radiology.uiowa.edu/VirtualHospital.html

ORGANIZATIONS

American Association for the Advancement of Science	http://www.aaas.org
American Association for Higher Education	http://www.aahe.org
American Medical Association	http://www.ama-assn.org
American Society for Microbiology	http://www.asmusa.org
American Society for Microbiology International	http://www.asm-intl.org/index.htm
Association of American Medical Colleges	http://www.aamc.org
Association for Medical Education in Europe	http://www.dundee.ac.uk/MedEd/AMEE
Centers for Disease Control & Prevention	http://www.cdc.gov/cdc.html
Educational Commission for Foreign Medical Graduates	http://www.ecfmg.org
International Association of Medical Science Educators	http://www.usd.edu/IAMSE
National Board of Medical Examiners	http://www.nbme.org
Society for Medical Decision Making	http://polaris.nemc.org/SMDM
World Federation for Medical Education	http://www.wfme.org
World Health Organization	http://www.who.ch

THE MEDICAL EDUCATOR'S RESOURCE GUIDE

ANATOMY

The Heart Preview Gallery	http://sln.fi.edu/tfi/preview/heartpreview.html
Radiologic Images	http://www.cc.emory.edu/ANATOMY/Radiology/Home.Page.MENU.HTML
NUS Histonet	http://vhp.nus.sg/HIS
The Visible Human Project	http://www.nlm.nih.gov/research/visible/visible_human.html
The Whole Brain Atlas	http://www.med.harvard.edu/AANLIB/home.html

BIOCHEMISTRY

Clinical Case Studies	http://home.cc.umanitoba.ca/~blanch/
Medical Biochemistry	http://colossus.chem.indiana.edu
Biochem & Molecular Biology	http://www.biocfarm.unibo.it//bbc/sequences.html

MICROBIOLOGY

CAI in Microbiology	http://monera.ncl.ac.uk/cal/cal.html
Medical Microbiology Course	http://midget.towson.edu/~wubah/medmicro/hpage.html
Molecular Virology	http://www.bocklabs.wisc.edu/Welcome.html
World Lecture Hal	http://www.utexas.edu/world/lecture/mic/

PATHOLOGY

Pathology Images	http://www-medlib.med.utah.edu/WebPath/GENERAL.html
Pathology Manual	http://indy.radiology.uiowa.edu/Providers/Textbooks/OBGYNOncology/PathologyManualHome.html

PHARMACOLOGY

Pharmaceutical Information Network	http://pharminfo.com/pin_hp.html
Pharm Web	http://sunsite.unc.edu/pwmirror/
Pharmacy World Wide Web	http://Chemdept.uwsp.edu/tzamis/pharmacyworldwide.html

PHYSIOLOGY

Virtual Classroom	http://www.phypc.med.wayne.edu

LIFE-LONG LEARNING

Lifelong Learning Sites	http://mailer.fsu.edu/~jflake/lifelong.html
Sunsite	http://sunsite.unc.edu/sunhome.html
(Untitled)	http://www.gsn.org/site/alpha.index.html
National Teaching & Learning Forum	http://www.ntlf.com

PROBLEM-BASED LEARNING

The PBList Home Page	http://ddsdx.uthscsa.edu/pblist/pblist.html
Southern Illinois University College of Medicine	http://edaff.siumed.edu/DEPT/Pblapp.htm

NEWS and INFORMATION

Biomedicine and Health in the News	gopher://inform.uchc.edu:70/11gopher_root%3A%5B_data04._data0401%5D
Chicago Tribune	http://www.chicago.tribune.com/
Chronicle of Higher Education	http://www.chronicle.merit.edu/.index.html
CNN	http://www.cnn.com
Internet Yellow Pages	http://www.wbsite.com/homepage.html
New York Times	http://www.nytimes.com/yr/mo/day/index.html
Wall Street Journal	http://www.wsj.com

JOURNALS ONLINE

AAAS Science	http://science-mag.aaas.org/science/home/index-alt.html
British Medical Journal	http://www.bjm.com/bjm
Emerging Infectious Diseases	http://www.cdc.gov/epo/mmwr/mmwr_oth.html
Journal of the American Medical Assn	http://www.ama-assn.org/public/jama/jamahome.htm
Listing of Peer Review Journals	http://www.ama-assn.org/med_link/peer.htm
Medical Teacher	http://carfax.co.uk/mte-ad.htm
Morbidity & Mortality Weekly Reports	http://www.cdc.gov/epo/mmwr/mmwr.html
Network of Community Oriented Educational Institutions for Health Sciences	http://www.unimaas.nl/~network/NEWSL27.htm
New England Journal of Medicine	http://www.nejm.org

LIBRARIES

National Library of Medicine	http://www.nml.nih.gov/index.html

TRAVEL

Currency Exchange Rates	http://www.olsen.ch/cgi-bin/exmenu/pathfinder
Language	http://pathfinder.com/@@M3wDF10FyQIAQN6y/Travel/language/index.html
Maps	http://pathfinder.com/@@FTrMTGOkGAAAQNyy/Travel/maps/index.html

TAKE A BREAK

Calvin and Hobbes Comics Gallery	http://eos.kub.nl:2080/calvin_hobbes/
Sherlock Holmes	http://www.cs.cmu.edu/afs/andrew.cmu.edu/usr18/mset/www/holmes.html

CALENDAR OF EVENTS

1998

A Systematic Approach to Assessment Across the Curriculum

February 8-12, 1998 — Springfield, Illinois, U.S.A.

CONTACT: Office of Continuing Medical Education, SIU School of Medicine, P.O. Box 19230, Springfield, IL 62794-1218; TEL: (+)1-217-782-7711; FAX: (+)1-217-785-4413

Options in Health Science Education

February 8-13, 1998 — Albuquerque, New Mexico, U.S.A.

This experiential workshop is oriented toward health care professionals who wish to explore the following topics: Problem-Based/Student-Centered Learning, Student Assessment, and Innovative Approaches to Teaching and Learning in an Integrated Curriculum.

CONTACT: Office of Continuing Medical Education, UNM Health Sciences Center School of Medicine, HSSB Rm 140, Campus Box 713, Albuquerque, New Mexico 87131-5126 TEL: (+)1-505-272-3942; FAX: (+)1-505-272-8604; EMAIL: kbrecken@unm.edu *(http://som.unm.edu/cme)*

Stop Surfing — Start Teaching 1998 National Conference

February 22-25, 1998 — Myrtle Beach, South Carolina, U.S.A.

Sponsored by the University of South Carolina. This conference will create a forum for higher education professionals to share ideas and solutions as well as propose questions and develop answers on the growing use of internet instruction.

CONTACT: TEL: (+)1-803-777-9444; FAX: (+)1-803-777-2663; EMAIL: confs@gwm.sc.edu

Orientation to the Tutorial Process Workshop

March 9-13, 1998 — Springfield, Illinois, U.S.A.

The purpose of this workshop is for participants to understand and apply the PBL Tutorial Process in the role of tutor, or facilitator.

CONTACT: Department of Medical Education, Southern Illinois University School of Medicine, P.O. Box 19230, Springfield, Illinois 62794-1217; TEL: (+)1-217-782-0795; FAX: (+)1-217-524-0192

Alternate Approaches to Traditional PBL

Annual Meeting of the Southern Region SIG on Basic Science Education

March 12-14, 1998 — New Orleans, Louisiana, U.S.A.

The Southern Regional Special Interest Group on Basic Science Education will meet for this **two-hour program** as an integral part of the annual spring conference held by the Southern Regional AAMC Group on Educational Affairs.

CONTACT: Gary Rosenfeld, Ph.D., AAMC-GEA National SIG Convener, Department of Pharmacology, UT-Houston Medical School, 6431 Fannin, P.O. Box 20708, Houston, TX 77030; TEL: (+)1-713-500-7435;FAX:(+)1-713-500-7455; EMAIL: grosen@farmr1.med.uth.tmc.edu

Teaching Microbiology and Immunology to Medical Students

Seventh Educational Strategies Workshop

May 2-6, 1998 — Myrtle Beach, South Carolina, U.S.A.

Presentation and workshop sessions related to Process, Content, Evaluation, and Curriculum. The emphasis this year will be on Content.

CONTACT: Roderick Nairn, Ph.D., Chair, Department of Medical Microbiology & Immunology, Creighton University School of Medicine, 2500 California Plaza, Omaha, Nebraska 68178; TEL (+)1-402-280-2921; FAX: (+)1-402-280-1875; EMAIL: rnairn@creighton.edu

Second Alberta Meeting on Medical Education

May 3-6, 1998 — Jasper, Alberta Canada

CONTACT: Evaluation of Instruction and Recognition of Teaching Conference secretary: Linda O'Dowd-Brown, Division of Studies in Medical Education Walter MacKenzie Centre, Edmonton, AB T6G 2R7 TEL: (+)1-403-492-6776; FAX: (+)1-403-492-5487; EMAIL: Linda.Brown@ualberta.ca *(http://www.ualberta.ca/~med/dsme.htm)*

Evolving Assessment: Protecting the Human Dimension

Eighth International Ottawa Conference

July 12-15, 1998 — Philadelphia, Pennsylvania, U.S.A.

This conference is a forum for professionals from around the world who are concerned with teaching and assessing health professionals.

CONTACT: National Board of Medical Examiners, 3750 Market Street, Philadelphia, Pennsylvania 19104; TEL:(+)1-215-590-9870; FAX: (+)1-215-590-9755; EMAIL: ottawa@mail.nbme.org *(http://ottawa.nbme.org)*

CALENDAR OF EVENTS

Current Issues in Medical Education
Association for Medical Education in Europe Annual Conference
August 30 - September 2, 1998 — Prague, Czech Republic
Plenaries, Workshops, Short Communications, and Poster Sessions relating to many different aspects of current issues. Directed toward teachers, educators, practitioners, students, and administrators.
CONTACT: AMEE Office, Centre for Medical Education, University of Dundee, Tay Park House, 484 Perth Road, Dundee DD2 1LR, Scotland, UK; TEL: (+)44-1382-631967; FAX: (+)44-1382-645748; EMAIL: p.m.lilley@dundee.ac.uk
(http://www.dundee.ac.uk/MedEd/AMEE/conf98.htm)

Faculty Development in the 21st Century
WHO/AMEWPR Fifth Conference
September 21-23, 1998 — Manila, Philippines
This conference is being arranged in collaboration with the Philippine Society of Medical Education.
CONTACT: Mrs. Loraine Kerse, Acting Regional Adviser, Human Resources for Health, World Health Organization Regional Office for the Western Pacific, United Nations Avenue, P.O. Box 2932 1000 Manila, Philippines

Higher Education in the Twenty-First Century
UNESCO World Conference on Higher Education
October 5-9, 1998 — Paris, France
CONTACT: UNESCO, 7 place de Fontenoy, 75352 Paris, 07 SP France; TEL: (+)33-1-45681095/45681126;
FAX: (+)33-1-45685626/27/28; EMAIL: ml.kearney@unesco.org
(http://www.education.unesco.org)

Eleventh Annual Meeting of the AAMC-GEA Special Interest Group on Basic Science Education
October 30-November 5, 1998 — New Orleans, Louisiana, U.S.A.
This Special Interest Group on Basic Science Education will meet for a **two-hour program** as an integral part of the Group on Educational Affairs during the Annual Meeting of the Association of American Medical Colleges.
CONTACT: Gary Rosenfeld, Ph.D., AAMC-GEA National SIG Convener, Department of Pharmacology, UT-Houston Medical School, 6431 Fannin, P.O. Box 20708, Houston, TX 77030; TEL: (+)1-713-500-7435; FAX: (+)1-713-500-7455; EMAIL: grosen@farmr1.med.uth.tmc.edu

1999

Fourth Biennial Conference of the International Association of Medical Science Educators
June 19-22, 1999 — (theme and location to be announced in spring of 1998)
Plenaries, Featured International Speakers, Point-Counterpoint Debates, Learning Workshops, Small Group Sessions, and Poster Presentations. All topics relate to faculty development through sharing and understanding the process of teaching and learning the basic sciences throughout the continuum of medical training.
CONTACT: Roger W. Koment, Ph.D., IAMSE President, Department of Microbiology, University of South Dakota School of Medicine, Vermillion, South Dakota 57069; TEL: (+)1-605-677-5174; FAX: (+)1-605-677-6299; EMAIL: rkoment@sunbird.usd.edu *(http://www.usd.edu/IAMSE/confer.htm)*

2000

Ninth Ottawa International Conference
March 1-3, 2000 — Cape Town, South Africa
This conference is a forum for professionals from around the world who are concerned with teaching and assessing health care professionals. CONTACT: Dr. Athol Kent, Postgraduate Conference Centre, Medical School, Anzio Road, Observatory 7925, Cape Town, South Africa; TEL: (+) 27-21-406-6381; FAX: (+) 27-21-448-6263; E-MAIL: hero@ct.lia.net

INSTRUCTIONS FOR CONTRIBUTORS

General

Deadlines for all submissions to the *Basic Science Educator* are December 1 for the Winter issue, and June 1 for the Summer issue. Most articles are approximately 2,000 words in length, except for Commentaries which are restricted to 1,500 words, and Letters which are limited to 500 words. Each submission will be reviewed by the Editor and two other members of the Editorial Board. Unless otherwise noted, send all submissions to Roger W. Koment, Ph.D., Editor, by e-mail (ASCII format) or by mail (University of South Dakota School of Medicine, Vermillion, South Dakota 57069, U.S.A.) See inside front cover for contact information on all Associate Editors. If mailed, enclose three complete copies including any photographs.

Articles

Submission is encouraged of articles relating to all aspects of teaching and learning in the medical sciences, and all forms of faculty development. Examples include, but are not limited to, integration of science throughout the continuum of medical training; experiments in individual course or curriculum design; creation of methods which stimulate thinking, problem-solving skills and foster independent student learning; methods to encourage student integrity, humaneness, and team-building characteristics; and programs directed toward basic science faculty development.

Innovations in Basic Science Teaching and Learning

The purpose of this column is to share new approaches to the teaching of medical sciences which will enhance the student's ability to learn. Contact: Harold Traurig, Associate Editor.

Computer Applications in Basic Science Education

The purpose of this column is to explore means by which computer technology may be used to aid both faculty and students in the teaching and learning of medicine. Contact: W. Marshall Anderson, Associate Editor.

Social Issues in the Basic Sciences

The purpose of this column is to present articles which stimulate basic science faculty to consider their role in all aspects of medicine and society. Contact: David Bolender, Associate Editor.

International Perspective

The purpose of this column is to demonstrate both the diversity and yet commonality of how the fundamental medical sciences are taught throughout the world. Contact: Roger Koment.

The Educator's Portfolio

The purpose of this column is to disseminate techniques currently in use, or under development, for the documentation of the educational activities of medical school faculty. Contact: Jay Menna, Associate Editor.

In My Opinion... (Debates)

Debates on issues of timely interest to medical science educators are welcome, and may actually be arranged with help from the Editorial Board. The purpose is to present readers with common arguments on each side of an issue to help us better understand different views. To discuss your ideas, to volunteer as one side of a debate, or to suggest a topic you would like to see debated, please contact Roger Koment. Format and length are negotiable.

Commentary

The Editorial Board encourages submission by individuals of their views on timely topics in medical education, especially those which relate to teaching and learning of the medical sciences. These essays may be up to 1,500 words in length.

In The Literature...

This column features reference citations and brief excerpts from articles in medical science education which are published in other journals or sources. Your submissions are encouraged.

Quotable Quotes . . .

These are anecdotal phrases of both serious or humorous (sometimes the reader must decide!) interest to medical science educators. Your submissions are encouraged.

Letters to the Editor

Reader response to articles in the *Basic Science Educator* is encouraged in the spirit of dialogue, and will be published as space permits. Letters may be up to 500 words.

Announcements

Announcements and news of interest to medical science educators are published in each issue. All topics may be considered.

Calendar

Notices of upcoming conferences, workshops, and other events of interest to medical science faculty are listed chronologically in each issue. Please send information regarding your event well before the December 1 and June 1 submission deadlines.

CHARTER MEMBERSHIP BENEFITS

INTERNATIONAL ASSOCIATION of MEDICAL SCIENCE EDUCATORS

- Subscription to the newly revised *Basic Science Educator* (two issues per year). Written specifically *for* medical science educators *by* medical science educators, this publication contains first released articles describing current trends in basic medical science education, reports, critiques, and commentaries on innovative teaching methods, debuts of educational software, and candid editorials.
- 20% discount on registration, plus priority admission to limited access IAMSE Conferences on educational strategies in the medical sciences
- 15% discount on IAMSE Conference Proceedings
- Complimentary copy of the IAMSE Directory of Colleagues, containing members' discipline, mailing address, phone, fax, e-mail address
- No increase in annual membership fee for 1998; further discount for Two-Year Membership
- Mailings of IAMSE conference announcements, brochures, calls for abstracts, and announcements of Conference Proceedings availability
- Professional advancement opportunities to network with colleagues at other medical facilities, establish collaboration and exchange programs, publish in the *Basic Science Educator,* conduct and/or attend workshops on educational methods, present projects from your school, and develop the credentials of a truly effective medical educator.

Charter Membership Fees (in U.S. Dollars)

	One-Year Membership			Two-Year Membership	
	Individual	Institutional†	Student††	Individual	Institutional†
United States	$35	$125	$20	$60	$230
Canada/Mexico	$40	$140	$25	$70	$250
All Others	$45	$150	$25	$80	$260

† Deans, Departmental Chairs, or equivalents may purchase Institutional Memberships which provide 4 Individual Memberships each. Those 4 designated by the purchasing body will be listed in the Directory. Limit one per department or unit, although more than one department or unit in a school may become Institutional Members.

†† Applications for Student Membership must be accompanied by a letter verifying this status from either your Professor (Graduate Students & Post-Docs) or Office of Student Affairs (Medical Students & Residents). Renewal must be verified annually.

(Please type or print clearly)

NAME_____ (Ph.D.) (M.D.) (Other)

ADDRESS_____

_____

_____

PHONE_____

FAX_____

E-MAIL: _____

Complete the following and return to:

International Association of Medical Science Educators,
6729 Curran Street, 1st Floor,
McLean, VA 22101, U.S.A.
TEL: (+) 1-703-442-4860,
FAX: (+) 1-703-448-6914,
E-mail: aiboss@aol.com

PAYMENT METHOD:

❑ Check is enclosed. (Payable to IAMSE) ❑ Credit Card — Visa or MasterCard (please circle)

$ _____ Membership Fee Enclosed. Additional U.S. Tax-Deductible Contribution to IAMSE: $_____ Total Amount Enclosed: $_____

Account Holder's Name: _____

Account Number: _____

Expiration Date:_____

Signature: _____

THE BASIC SCIENCE EDUCATOR

A Publication of the International Association of Medical Science Educators

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