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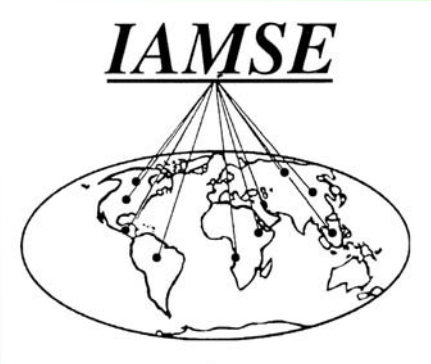

Excellence in Basic Sciences: A Novel Model for Instruction of Medical Students

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Message from the Executive Director

Roger W. Koment, Ph.D.

Scholarship. A word we all use but how is it actually defined? To the basic scientist the meaning is clearly ingrained from our graduate student days that scholarship equals publication. And not just any publication, but specifically within certain journals of our discipline. For decades, survival at the bench has seemingly necessitated becoming narrower and narrower in our expertise, cornering the market on a specific niche in the scientific research world. We publish in evermore specialized journals with an extensive list of co-authors, each of whom is an expert in an area adjacent to our own. How long can this specialization continue before serious consequences ensue? Ask the dinosaurs! How ironic that in all other aspects of our lives, the opposite is true. Career expectations are expanding and if we are to succeed, our definition of scholarship must do likewise.

The focus of this message is a wake-up call to all medical science educators, be they basic scientists or academic clinicians, to look around them at the world in which we live today. No longer can we blindly accept the doctrine in which we were trained that scholarship equals *only* research publications. The demands on medical faculty have forced us to broaden our outlook, to venture out of our laboratories and into the active milieu of the modern medical center. As faculty members, we are expected to be competent leaders in educational reform and creating institutional policy. It is assumed that we can move effectively between lecture format and small group teaching, all the while understanding the dynamics of adult learning. We are expected to competently and compassionately advise medical students on problems which ten years ago did not even exist. These plus a host of other skills that our graduate advisors could not have anticipated have now become the norm.

Yet beyond our narrowed disciplines, most of us are not experts! How then can we develop these new skills? Where can we go for a credible source of requisite knowledge? Whether visiting medical schools throughout the United States or traveling to countries abroad, I find such questions and insecurities are becoming a dominant concern. That is precisely why the International Association of Medical Science Educators (IAMSE) is so timely and necessary to medical academia today. As a professional development society, IAMSE strives to provide information, training, and opportunities for scholarship to meet the expanding roles of each individual member.

This journal, *JIAMSE*, is one such opportunity. Between these electronic pages are ideas to stimulate and inform. Medical education is evolving at an accelerating rate, and we as basic science educators cannot afford to be left behind. Many of you share my personal bias that it is we the practitioners who must guide those changes which impact most directly upon our disciplines. Reading *JIAMSE* and assimilating new ideas can educate the mind. Publishing in *JIAMSE* the educational techniques you have developed and honed is another step toward broadening your sphere of scholarship.

We live and work in ever expanding careers and to succeed, scholarship outside the research laboratory must keep pace. Through IAMSE and *JIAMSE*, we will continue to provide the means for individuals to redefine this term as they continually strive to redefine themselves.

The Medical Educator's Resource Guide

John R. Cotter, Ph.D.

In a previous issue of the Resource Guide (Vol. 12 #1, 2002), two examples illustrated how Websites can be linked to and incorporated into a lecture in real time. The incorporation of digitized Web based images into Microsoft® PowerPoint® presentations is another strategy for using the Internet for instructional purposes.

The Internet is a rich source of images for lecture. At my institution several professors of histology routinely find histological images on the Web that are used to complement their lectures. In addition to using Web based images for lecture, one instructor provides her students with the URL for each image that she uses. In doing so, students can go directly to the source of the image to study their lecture notes along with the images that were used in class.

If you peruse Web sites that are posted for courses on the Internet, you'll see that some instructors do much the same thing by providing students with a list of hyperlinked sites that are related in some way to the courses they teach. Students of histology at our institution, for example, are encouraged to use sites that are listed on our course resource page for self-assessment. Indeed, many of the sites have quiz options that students use with enthusiasm in preparation for examinations. Even without a formal method of assessment, sites that are content rich can be used for self-study and review.

In many instances, if you examine the copyright notice you may discover that the copyright holder for the site welcomes the use of their images. Often times, there is a clear statement that images may be used for noncommercial educational purposes. Be cautious though because some sites may be more restrictive. If there is any question regarding what you can or cannot do, you should contact the copyright holder and author for the appropriate permissions. If you plan to link to a site, you should also ask the copyright holder and author for permission to do so.

The Internet is a source of information for subjects that are taught by medical educators. However, the variety and unevenness of Web site construction can be perplexing when thinking about how to use Web sites in the basic science courses that we teach. The role of the Resource Guide is to identify Web sites that will be most useful to educators. If you have used on-line materials in your class, please consider sharing your experience with our readers by submitting a review of the Web site or sites that you are using to The Medical Educator's Resource Guide. Send all submissions to jrcotter@buffalo.edu or use the IAMSE Web page at <http://www.iamse.org/pub/bse_resource.htm>. Please include the URL and a short critique of between 100 and 200 words.

Malaria: An On-line Resource. Royal Perth Hospital.
http://www.rph.wa.gov.au/labs/haem/malaria/index.html

This site, created by the Division of Laboratory Medicine at Royal Perth Hospital in Australia, is designed for physicians and diagnostic laboratory personnel. Information at the site is current (2002-2003) and goes beyond what is found in a general medical microbiology textbook. Hot button topics include "History", "Diagnosis", "Prophylaxis", "Treatment", "Teach and Test", and "Links". To navigate the site as a student, start with "History" to obtain background information including the life cycle and epidemiology of the parasites, and basic information about prophylaxis and treatment. The clinical information regarding prophylaxis and treatment includes dosage information and is more appropriate for physicians. The "Diagnosis" section includes a description of the dipstick test for malaria, which, while used in Australia and other countries, is not yet licensed in the US. The extensive "Teach and Test" section is a very useful tool for learning to distinguish malarial parasites on blood smears. The user views a smear, accompanied by a short case history, to determine which species of parasite, if any, is involved. Correct and incorrect answers are explained, and key diagnostic features are emphasized. Links include WHO, CDC, and several other sites. (*Reviewed by Bonnie Buxton, Ph.D., University of Health Sciences- College of Osteopathic Medicine, Kansas City.*)

Medical Microbiology. Neal Chamberlain, Kirksville College of Osteopathic Medicine.
http://www.kcom.edu/faculty/chamberlain/

This is an excellent Web resource in medical microbiology. It is designed for a specific course but would be useful for faculty or students involved in similar courses at other institutions. The major focus is the course lectures and a laboratory exercise (cultivation and identification of bacteria), but there are abundant links to CDC information, e.g., notifiable diseases and immunization schedules; image libraries; and news sites. A lot of the material such as common causes of various diseases and infectious disease names and their etiologies can be downloaded to a PDA. There is also an exhaustive list of the microorganisms that

can cause specific types of infection, e.g., pneumonia and sexually transmitted diseases. Another nice feature is "Clinical Cases on the Web," which contains cases developed at KCOM and links to cases at many other sites. This site is outstanding but would be further strengthened by the addition of a section with practice questions for students. (*Reviewed by Dixie D. Whitt, Ph.D., University of Illinois College of Medicine at Urbana-Champaign.)*

Medical Mycology. The University of Wisconsin.
http://www.medmicro.wisc.edu/Resources/ImageLib/Mycology/index.html

This site is extremely useful for teachers, clinical microbiologists, undergraduates, and graduate students in different fields who are studying medical microbiology. It is divided into two sections: "Mycology Image Library" and "Diagnostic Key". In the latter, organisms are presented in three sections: a) Yeast and yeast like organisms, b) Molds, and c) Other selected images. Important diagnostic features of yeast, molds and dermatophytes such as pseudohyphae, blastoconidia, and chlamydoconidia, and septate and non-septate hyphae, as well as ectothrix and endothrix hair infections are highlighted. Tissue and mold forms of dimorphic fungi are clearly presented. The site uses different diagnostic stains and preparations to illustrate the organisms: gram staining, KOH preparations and histological preparations. Human and animal clinical images of infections are also shown. This site is interesting in its layout. It is concise, focused and easy to navigate. (*Reviewed by Musau WaKabongo, Ph.D., Des Moines University - Osteopathic Medical Center, Des Moines, IA*.)

Microbes.info. The Microbiology Information Portal.
http://www.microbes.info/index.html

As its name implies, this site is basically a comprehensive web portal with links to other microbiology related sites. Sites need to be carefully chosen, especially by students, since many of the links are for the general public. For medical students and professional medical microbiologists, the most useful links are listed in the "Medical Microbiology" section under "Resources". This opens additional categories, including "Diseases and Conditions", with more than 90 additional categories and additional links. There is a search utility that might help with navigating the site more quickly; however, it must be used carefully. For example, typing in "pertussis +toxin", as per the instructions, retrieves a fungi site as the best match, but "pertussis toxin" results in more specific sites. The search utility does not search the Web. For professionals, a similar search using Google, Kartoo, or Scirus is more useful. (*Reviewed S. James Booth, Ph.D., University of Nebraska Medical Center, Omaha, NE.)*

Renal Pathology Tutorial. J. Charles Jennette, University of North Carolina at Chapel Hill
http://www.gamewood.net/rnet/renalpath/tutorial.htm

This site is an instructive review of some of the aspects of renal disease and pathology. It includes the normal histology of the glomerulus, clinical presentation of glomerular disease, and a brief synopsis of a few of the glomerular diseases (minimal change disease, focal segmental glomerulosclerosis, membranous nephropathy, and membranoproliferative glomerulonephritis types I and II). The text is concise and informative. Incorporated into the text are diagrams and light microscopic, immunofluorescence and electron microscopic images. The images are clear and well explained. One drawback is that some of the images are not available for viewing. The site is linked to case studies (six) which provide clinical history, photomicrographs, pathologic diagnosis and in depth discussion. The site is still under construction with future segments highlighting diseases associated with the nephritic syndrome, renal vascular disease, tubulointerstitial diseases, transplant pathology, and renal neoplasms. This site is recommended for medical students and pathology residents. It is a useful and very good resource. (*Reviewed by Barbara K. Stefanick, M.D., Kaleida Health, State University of New York at Buffalo, Buffalo, N Y.*)

The World of Parasites. James Smith. McGill University
http://martin.parasitology.mcgill.ca/jimspage/worldof.htm

This site is a great resource for educators, students and lay people. A map of the world is the gateway through which the user is introduced to the subject of parasitic infections. A list of parasites from each part of the world, the name of the disease associated with the parasite, and its occurrence and mortality are displayed by selecting a region or country from the map. More information about a parasite is provided by selecting one of the parasites from the list. For example, when *Onchocerca volvulus* is selected, one is given a description of the disease; its severity, economic impact, and manner of transmission; a description of the adult worm; and a picture of the fly that is responsible for transmitting the parasite. The *World of Parasites* is simple, easy to navigate and well constructed. There are also a number of Internet links that the user may find useful. (*Reviewed by Musau Wakabongo, Ph.D., Des Moines University Osteopathic Medical Center, Des Moines, IA).*

Poem Upon Completion of Dissection in Gross Anatomy

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My father always told me your body is simply a vehicle
A vessel for transition
Superstitions predict positions of power for those who are selfless
Traditions pass visions of peaceful exodus
Yet next to us corpses are scorned as morose
Don't you rather them diagnosed as virtuous?
I know I am envious of their courage
Of their fearlessness and powerful pledge
For they may never hear their daughters' song
Or peer at their lovers' trembling lips
Yet they still come bearing gifts
And to keep giving even after their ascent
Is monumental action, just a fraction of amazing
To provide demonstration for education is beyond appreciation
It's extraordinary
And yet very few can comprehend their decision
And deem this path dim
I feel it swims in radiance
And as their spirits with Angels dance
I honor their resolution, their brilliance
For they knew that our scalpels had no place to pierce them
And death no place to enter
They have surpassed death
And with that given us more than we may know.

Eleonora Walczak
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Excellence in Basic Sciences: A Novel Model for Instruction of Medical Students

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ABSTRACT

An innovative and educationally sound method was introduced at the University of Louisville, School of Medicine for the education of the second year medical students. Instruction is by physicians, who present a clinical case in the Socratic manner. A group of students, through questioning, derive important facts about the case and ultimately agree on a differential diagnosis for the patient described in the case. The students then spend individual time arriving at the diagnosis of the disease and submit a report on their research. This information is shared with the entire class. This novel approach is amenable for use in other medical school years, as well.

INTRODUCTION

Extensive research on student learning has been conducted and has revealed that students learn most effectively (in ways that have sustained and substantial influence on the way they think, act, and feel) when at least five conditions prevail: 1) when they are trying to solve problems or answer questions that they regard as important, intriguing, or beautiful; 2) when they are able to do so in a challenging yet supportive environment in which they can feel a strong sense of control over their own education; 3) when they can work collaboratively with other learners to grapple with the problems; 4) when they believe that their work will be considered fairly and honestly; and 5) when they can try, fail, and receive feedback from expert learners in advance of and separate from any summative judgment of their efforts. This summation is distilled from the work described in ref. [1-18]

Excellence in Basic Sciences (EBS) was formulated on the basis of the research described above and matches all the criteria listed for optimal learning conditions. It is a method designed for putting medical students into a situation of nonthreatening discovery, relevant and cooperative learning, and group and individual problem solving.

METHODS

The cases

A clinical case illustrating a particular organ system is developed for the series. This includes a write-up of the case, attachment of appropriate history of present illness, relevant symptoms, physical findings, laboratory tests, imaging studies, and anything else that leads to a definition of the medical cause of the case. Then, after the solution is developed, all of the relevant basic science facts, which relate to the case are added (Figure 1).

The complete case is made available to the physician presenters. However, only the stem of the case describing the patient and complaint which brings the patient to the physician is distributed to the students (in this instance the second year medical class) by email.

The presenters

Physicians at various stages of their career are recruited to present the case to medical students (described in results).

The session

Students come to the session with the case. The physician opens with the question: "What do you want to know?" The physician only provides answers for questions asked by the students. As the questioning proceeds, the history, physical examination, tests ordered and available results are revealed, if requested. In the beginning sessions, the physician may prompt the students to make sure all relevant data are covered in the discussion. Later sessions reveal that the students have acquired a very efficient data seeking methodology. The physician then helps the students develop a differential diagnosis based on what has been revealed. Often this involves discussion among the students who are present at the session. The students are left with several differential possibilities, including the true solution to the case. Ideally, the students then do their own research to come up with the diagnosis and support their findings. They email the solution to the course

Figure 1 (see References 19, 20)

Beatrice, "Bee" to her friends, is a 39-y/o single woman who presents to the University of Louisville Hospital ER with increased shortness of breath, accompanied by left pleuritic chest pain. These symptoms started about 2 weeks ago. Prior to that she had no relevant health complaints. She is concerned.

What do you want to know?

History: She has a history over the past year of "dysfunctional uterine bleeding". Her chest pain has worsened upon respiration, is stabbing, and does not radiate. She also reports that she has increased coughing and brings up "yellow-green sputum" sometimes tinged with blood. She also states that she has had recent fevers, accompanied by chills. She is also easily fatigued and reports that she is disinterested in many of the things she likes to do. She reports she was tested for tuberculosis earlier this year, but the test was negative.

Family history- Significant for heart disease, her father, an aunt, and two uncles had early cardiac infarctions.

Social history- She is involved with church outreach activities and does not tolerate the use of alcohol, drugs or tobacco.

Meds- She is allergic to beta lactam antibiotics. She is currently on iron sulfate.

PE: Decreased chest movement during inhalation on the left side. Dullness of percussion on left lung base. Reduced breath sounds over left lung base and bronchial sounds auscultated on left side with friction rub. Tests on the right side are normal. Location of dullness moves with respiration and there is a decreased tactile fremitus over the left lung. Temperature is 102.9^{o} F; BP 87/55; pulse of 130, and respiration rate of 23. Head, neck, cardiac, abdomen, visual, extremity tests normal

LABS:

- CBC- elevated WBC with predominance of neutrophils
- Serum LDH- 248 U/L (100-190 U/L)
- Serum protein- 3.9 mg/dL
- Thoracentesis under CT guidance yields about 100ml of purulent fluid.
- Assay of purulent fluid: WBC 250,000 with 99% segs, 1 % lymphocytes, and no monocytes visualized. Pleural fluid glucose is 5.8mg/dL, protein 5.0mg/dL, and LDH at 20,000 U/L. Gram stain- visualize WBC and some Gram-positive cocci.
- Pleural fluid culture- Group A *Streptococcus.*
- Sputum culture- Gram stain- WBC, some epithelial cells and many Gram-positive cocci. Cultures grow *Staphylococcus aureus*.

CT: Chest shows "large left pleural effusion that has areas of loculation along the medial left heart border".

Diagnosis: Pleural disease as a sequelum to bacterial infection

Treatment: A left chest tube is inserted and a liter of fluid is drained. Bee's temperature decreases but she continues to have some fever and her white cell count does not moderate. When the fluid has drained, an X-ray demonstrates some areas of loculated fluid. She is treated with streptokinase through her chest tube to facilitate drainage. She subsequently responds to the treatment and is ultimately released and prescribed antibiotics to resolve any residual bacterial infection.

Basic science discussion: Effusions may be due to infection (viral, mycobacterial, bacterial, fungal) or malignancy, congestive heart failure, cirrhosis, nephrotic syndrome, trauma, pancreatitis, collagen disease and drug reactions. Effusions are transudative or exudative

	Transudative	Exudative
Pleural TP/serum TP	<0.5	>0.5
LDH	<2/3 upper normal	>2/3
Pleural LDH/serum LDH	<0.6	>0.6
WBC	<1000	>100,000
Glucose	= blood	< blood
Protein	<3g/dL	>3g/dL
Causes:	CHF, cirrhosis, nephrotic syndrome, peritoneal dialysis, hypoalbuminemia, urinothorax, atelectasis	TB, infections, malignancy, pancreatitis, pulmonary embolus, Chylothorax (milky pleural fl.), drugs, collagen vascular disease

Incidence of Pleural Disease (USA per year)			
CHF	500K	Pulmonary embolism	150K
Pneumonia (bacterial)	300K	Viral diseases	100K
Malignancy	200K	Cirrhosis (ascites)	50K
Lung	60K		
Breast	50K		
Lymphoma	40K		
Other	50K		

Figure 2. Sample solutions from students

1) A little review: "The pleura is a serous membrane made of a single layer of mesothelial cells. The *visceral pleura* covers the lung parenchyma, and the *parietal pleura* covers the remaining structures of the thoracic cavity. The airless space between the parietal and visceral pleurae is the *pleural space*. The fluid in the space is normally clear and colorless with a low protein concentration (less than 1.5 gm/dL) estimated at 10 ml in humans."-Noble:Textbook of Primary Care Medicine, 3rd Ed.

   Parapneumonic Effusion is defined as a pleural effusion associated with bacterial pneumonia. It occurs in 40% of bacterial pneumonia cases on the ipsilateral side of pneumonia. Pneumococcal pneumonia...although most common...does not usually cause parapneumonic effusion. This is usually caused by anaerobes, Gram-negative bacteria, *Staphylococcus aureus* and *Streptococcus pyogenes*. (Our patient had a Staph/Strep pneumonia).

   Criteria are as follows: Pleural effusion has 3 cardinal signs-dyspnea, chest pain, and a nonproductive cough. Parapneumonic effusion if exudative with leukocytes>10K and mostly PMNs. Uncomplicated if effusion resolves with antibiotic therapy only. Complicated if fluid needs a chest tube drainage, is empyemic, has a pH <7.0, glucose<40mg.dL or LDH > 1000 IU/L (our patient fits this profile)

   Source: Noble: Textbook of Primary Care Medicine, 3rd Ed.

2) I came in a little late, so I may not have all the correct information, but here is what I think: The patient's presentation is most consistent with a diagnosis of bacterial pneumonia with the complication of pleural effusion. Her fever, chills, pleuritic (stabbing, non-radiating) chest pain, cough production of yellow blood tinged sputum, dullness at left lung base, friction rub, decreased chest movement on the left, increased neutrophils, and Gram-positive cocci are all diagnostic features. I would even venture to say she may have empyema due to leukocytosis and infection.

director within three days (Figure 2). As an added benefit, a cost analysis of what the students "ordered" can be presented to the class to expose them to the reality of medical costs (Figure 3).

The solution to the case

The complete solution is posted a few days later for the class to review and copy if needed. Also, the solutions offered by students are posted along with the case for everyone to review.

RESULTS AND DISCUSSION

During the last two academic years, 57 voluntary Excellence in Basic Sciences (EBS) sessions have been done at the University of Louisville School of Medicine. The sessions occurred each Wednesday at noon, except during examination weeks and vacation time. The attendance varied with the sessions and the other events occurring at the medical school (ranging between 10 and 40 students per session/class of 140). There was a core of students that did not miss a session. There were several who came to most of them. Other students attended some sessions but not others, as time permitted. However, as shown in Figure 4a, the worth of these sessions was high for everyone who completed the survey and who attended the sessions. The overall effectiveness was rated as very high (Figure 4b). Since only a fraction of the class participated in this voluntary activity, the results may be skewed by the fact that motivated students, who would benefit most from these sessions, participated most and rated it well. This cannot be disproved, though experience has shown that students who are not at the top of the class have also come to the sessions regularly and even if not visibly participating, still took careful notes and presumably benefited from the exercise. A minority of the students turned in reports, though some did it regularly. Many more copy the posted case, solution and basic science correlation. Some request that the solution be emailed to them. Many keep a portfolio of these cases and use it as a

Figure 3. Estimated cost analysis of procedures in this case. (Average charges at our ER)

Level III ER Visit (Facility fee)	$348
Level III ER Visit (Physician fee)	$150
Chem 7	$115
CBC	$102
Chest X-ray	$190
Chest CT scan	$897
(Could you have treated with CXR only? Note huge cost difference)	
Chest tube insertion (Facility fee)	$396
Chest tube insertion (Surgeon fee)	$150
IV Clindamycin	$120/day x 7days
TCU hospital bed for 4-days/chest tube care	$1900/day
Physician hospital follow up visit for 6days	$55/day
Med/Surg hospital room for 3 days	$845/day
Total charges to Patient	$13,653

Remember these are average charges and it doesn't mean the insurance company will pay this. They usually steeply discount reimbursement. Medical care is expensive and should be considered as you order procedures and labs.

Figure 4a. Analysis of Student Responses to Questions about EBS (1 year)

Questions	Frequency
Were you able to correctly diagnose cases?	69% (22/32)
Did you find the case studies valuable even when you missed the diagnosis	88% (28/32)
These sessions will continue in the 2003-4 academic year. Would you recommend the EBS sessions to those coming behind you?	78% (25/32)

Figure 4b. On a scale of 1 to 5 with one being worst to 5 being best, please rate the effectiveness of EBS

Frequency						Mean	Median	SD
Scale	1	2	3	4	5			
# respondents	1	3	11	11	6	3.6	4.0	00

study aid. The students can interact with EBS at three levels-active research and solution of the case, passive note taking and copy of the solutions, or just listen to the presentation and derive knowledge of the clinical discovery mechanism. All are valid responses to the EBS series. More students would participate, if there were not competing events at lunchtime and the pressures of block exams at our school. Other schools may choose to operate a similar series at a different time of day.

In the last academic year we ran sessions on: kidney stones, MS, portal hypertension, idiopathic myelodysplasia, inflammatory bowel disease, PHH, Von Willebrand's Disease, acute pancreatitis, chronic granulomatous disease, myelodysplastic syndrome, pleural disease, tic doulourex, osteomalacia, juvenile rheumatoid arthritis, arsenic poisoning, Von Gierke's disease, hypothalamic amenorrhea, Munchausen's syndrome, depression after MI, sarcoidosis, Legionnaire's disease, pheochromocytoma, CMV colitis and *clostridium difficile* in AIDS, jaundice-neonatal and estrogen induced cholestasis, protein malnutrition-kwashiorkor, pancreatic-pleural fistula compounded by chronic pancreatitis and onset diabetes, and bioterrorism.

The faculty who ran these sessions ranged from residents and chief residents in Family Medicine, Pediatrics, Internal Medicine, and Medicine to faculty in Pediatrics, Medicine, Surgery, Family Medicine and Psychiatry. We also had the Dean of Student Affairs, the Associate Dean for Curriculum, and course directors for Pathology, CPS (Clinical preparation course) and PCC (Clinical Services). The sessions worked with no formal preparation of the faculty. They all received the full case several days before their presentation and had time to prepare themselves for the questions the students offered. Preparation time varied from person to person but usually consumed no more than a couple of hours. Some also brought ancillary materials and also prepared some basic science explanation of what results from physical exams, labs, and devices would indicate for the patient under discussion. We have videotaped some of our presentations and intend to use them as training material for future physicians.

The whole session is student question driven and relies on the innate knowledge of the physicians to relate the relevant facts to the students. Several of the physicians presided over multiple cases, and every one of them found this to be a stimulating and "fun" experience. Every one of the presenters has volunteered to run a case next year and we have several new volunteers as well. The Dean for Student Affairs ran two sessions, one early and one later in the year. She was impressed how far the students had progressed in their discovery questions and correlations.

In sum, EBS represents an exciting, novel education technique that both the students and the presenters appreciate. The learning in these sessions is multifaceted, not only exposing the second year students to the discovery process that they will learn in detail in the third year, but also causing them to recall and fix in memory basic science facts from previous courses and relating them to medical situations. Similar sessions, adapted for the needs of the other medical school years, would also provide an attractive variant to standard lectures. We have arranged for some EBS sessions in the first medical school year, initiated a session for the transition summer between first and second years, and have already run some for the third year medical students. This method should be applicable to a variety of curricula, impacting not only those which are standard lecture driven but also providing a refreshing alternative to purely PBL-based education. It must be mentioned that an EBS session covers a clinical case with many basic science applications, but requires considerably less time and faculty effort than standard PBL cases.

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Enhancing Academically Diverse Students' Learning and Interest in an Undergraduate Anatomy Course via Innovative Teaching Measures

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ABSTRACT

A challenge of the undergraduate anatomy course at the University of Michigan Medical School is the diverse educational background of students taking the course. Students taking this course belong to kinesiology, Literature, Science & Arts, dental hygiene, biomedical engineering, and pre-pharmacology and other graduate disciplines. Questionable motivation and poor course performance of more than 50% of our students caused us to introduce innovative teaching measures during the Fall 2002 semester. These measures included: 1) regular quizzes, 2) frequent visits to the gross anatomy lab, 3) specific lecture objectives handed out before lectures, 4) PowerPoint® lecture presentations that sometimes included animations of basic anatomical concepts, 5) a "Coursetools" web site that contained lecture objectives and presentations, schedules, announcements, and a discussion forum, and 6) mandatory modules that utilized plastinated specimens and covered essential course concepts. Student questionnaires were administered and analyzed to evaluate the effectiveness of these methods. The aim of introducing survey questionnaires during the semester was to focus attention on specific emerging issues that needed prompt management during the course. Results showed that the majority of students favored the weekly quizzes, lab visits, PowerPoint presentations, and lecture objectives. Also, there was a statistically significant improvement in students' performance from all disciplines during the final examination compared to the first and second examinations following the introduction of the measures. Although these teaching techniques have not significantly raised students' mean performance in relation to previous years, the results showed that they were welcomed by the majority of students and that performance was positively enhanced. These measures will be re-implemented during the next semester and their effectiveness further evaluated.

INTRODUCTION

The Division of Anatomical Sciences at the University of Michigan Medical School offers an annual anatomy course for undergraduate students in different academic programs. This is a required lecture-based course offered during the Fall semester that has an average annual enrollment size of about 150 students from five academic areas: 1) Kinesiology (35%), 2) Literature Science and Arts (LS&A) (25%), 3) Dental Hygiene (20%), 4) Biomedical Engineering (BME) (10%), and 5) other disciplines (Others) (10%). Former course assessment was based on three multiple-choice-question exams including the final. The first exam covered the first month's material that dealt with the general organization of the human body and the musculoskeletal system. The second exam covered the control and integration systems, and the final exam covered the remaining major systems and had 20% of its questions from earlier sessions.

A persistent and critical challenge is the diverse educational background of students taking the course. This issue is reflected on the students' perception of the course's relevance to their future careers. Many students consider anatomy merely a prerequisite for their graduate studies.[1] For several years it has been noticed that this matter has adversely affected the course performance of more than 50% of the students, particularly those students in the dental hygiene and kinesiology programs.

New teaching measures were introduced during the Fall semester of 2002 to address this issue and to re-emphasize the course's goal of acquainting students with the essential and integrated anatomical facts that will be useful in their studies, careers and everyday life. The teaching methods

employed in this study were based on published data that students' performance and interest could be enhanced with: 1) ongoing means of assessment,[1,2] 2) the initial provision of lecture objectives,[2,3] 3) the introduction of sufficient opportunities for students to interact with faculty and discuss concerns,[3,4] 4) the provision of interactive web-based tools for learning,[5] 5) the reinforcing of relevance through lab visits and modules.[6]

MATERIALS AND METHODS

Many of the new measures were implemented at the beginning of the course. These included: periodic quizzes, usage of plastinated anatomical specimens, frequent lab visits, three required learning modules, PowerPoint lecture presentations, and a course web page.

Quizzes were administered periodically to encourage both attendance and preparation. These quizzes were administered in PowerPoint format. Students answered on "scantron" computer forms, which allowed each quiz to be graded by the following day. This method permitted quick feedback to students and availability of the item analysis output.

Plastinated anatomical specimens were used during each lecture. Students were given the opportunity to closely examine them afterwards. Also, students were given the opportunity to familiarize themselves with pertinent plastinated material during frequent visits to the gross anatomy lab. Four visits to the gross anatomy lab were arranged. Plastinated specimens were displayed and faculty members were available to assist students in understanding the relevant anatomical and clinical knowledge.
Throughout the semester three learning modules were assigned which covered essential course concepts and utilized plastinated specimens. Each module consisted of a plastinated organ or joint and instructions with illustrations explaining its required anatomical features. Students were encouraged to review these modules in groups to facilitate discussion and understanding. PowerPoint presentations were created to accompany each lecture. These presentations often included animations of basic anatomical concepts.

A "Coursetools" interactive web page was created. It allowed students a twenty-four hour access to lecture objectives, PowerPoint presentations, schedules, announcements, and provided a discussion forum to facilitate communication amongst students and faculty.

Directly following the first course examination, an informal meeting was scheduled with a representative group of students to address their concerns surrounding test performance. Forty-five students, approximately one third of those enrolled in the course, volunteered and met to discuss the new measures. This provided a forum for direct communication with those students most concerned with the course's structure and teaching methods. Consequently, the following measures were also implemented as a result of the meeting: 1) specific lecture objectives were prepared and distributed to students, occasionally, quiz and exam questions were based on those objectives, and 2) more quizzes were added to continue with the weekly pattern through the end of the semester.

Two identical questionnaires (Q1and Q2), administered after the first and second exams focused exclusively on our testing techniques. The questions centered on the relevance of examinations to lecture objectives and physical testing boundaries (i.e. exam length and time). A third questionnaire (Q3) administered at the midpoint of the course (immediately before exam two) contained 25 questions that surveyed the broad array of new measures implemented in this investigation. Questions were organized into the following categories: improving the lecture, usefulness of the learning modules, course web evaluation, laboratory visits, class quizzes, and exam structure. The value of course web material and the desired frequency of lab visits were investigated for their overall effect on the learning process.

A fourth questionnaire (Q4) was administered during the final exam and further examined the issues described in the mid-point survey (Q3). Students were again asked to respond to the usefulness of the new teaching methods.

All student responses were evaluated using a five-point Likert scale and analyzed using the Statistical Package for Social Sciences software (SPSS version 6.1 for Mac). In tabulating the responses the scale was reduced to three points for the sake of simplicity. Mean responses to each question from all surveys were calculated and analyzed. Each new measure could then be considered using its relative approval as evaluated anonymously by the students. The first, second and final exam scores in all five disciplines were assessed by a multivariate analysis of variance with repeated measures. These analyses examined the magnitude of improvement in performance over the three exams. Analysis of variance (F ratio $p<.05$) and Duncan's Multiple Range Test (global alpha=.05) were used to determine differences in students' performance in the five disciplines.

Each questionnaire also contained a written "Comments" section that gave students an opportunity to communicate other course-related issues.

RESULTS

The response rate to the questionnaire about the new measures (Q3) was 83% (N=143). The majority of students favored lecture objectives (80%), PowerPoint presentation of lectures (64%), posting PowerPoint presentations on the course's web (75%); weekly quizzes (71%); exams to be based on lecture objectives (89%), lab visits (60%), and the learning modules (60%). Around half of the students favored didactic presentations (49%), the use of anatomical specimens (56%), PowerPoint presentation of quizzes (58%), including images and diagrams in quizzes and exams (56%), more than two exams during the semester (53%), and more regular lab visits (55%) (Table 1). Likewise, the final

exam questionnaire (Q4) showed similar responses from students (Figure 1).

The response rate to both exam questionnaires (Q1 and Q2) was 86% (N=143). Table 2 shows a significant improvement in student satisfaction with the exam following the implementation of the new measures. Feedback from the exam one questionnaire (Q1) indicated that one-third of students did not feel that the exam covered material from lectures, textbook or syllabus. Moreover, nearly half of the students disagreed with the statement that their exam performance was reflective of their overall preparation efforts. The average grade of the first examination was 72.6%.

The same questionnaire was administered to all students after the second exam (Q2). When asked about relevance of exam questions to course material, readings and the syllabus, only 4% of students disagreed with these questions. More than half of the students agreed that their performance was reflective of their overall efforts, while only 25% disagreed and the remainder gave a neutral response (Table 2). The improvement in second exam mean performance (76.5%) compared to that of the first exam (72.6%) was statistically significant. In general, feedback from this questionnaire was more positive on almost all issues.

Figure 1. Students' responses (N=143) to the survey questionnaire on the new measures administered during the final exam.

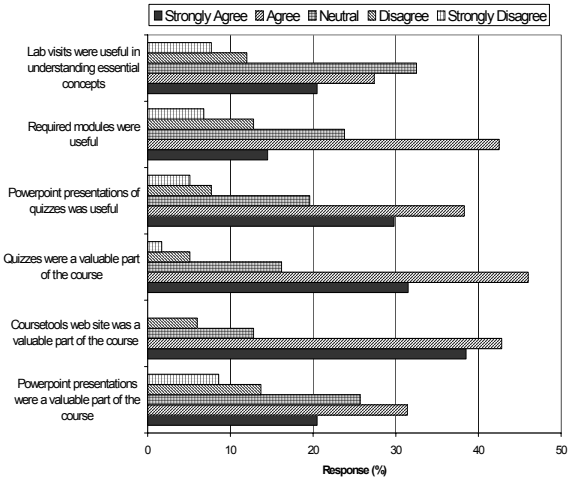

Table1. Students' responses to the survey questionnaire on the new measures (N=143).

Items	Agree (%)	Neutral (%)	Disagree (%)
Lectures: objectives helpful in studying	80	17	4
PowerPoint presentations helpful in promoting Understanding	64	14	22
Didactic presentations were helpful	49	44	7
Last 30 min for discussion	41	34	25
Anatomical specimens were helpful in understanding concepts	56	33	11
Web: PowerPoint presentations on the web were helpful	75	13	12
Course Web was useful in promoting understanding	36	45	19
Quizzes: weekly?	71	14	15
Too many?	49	27	24
PowerPoint quizzes were useful	58	25	18
Written quizzes?	33	32	35
Include images and diagrams?	56	31	12
Exams: more question types?	35	34	31
Based on Unit objectives?	89	9	3
Higher percentage of the final grade?	41	36	22
Include images and diagrams?	53	32	15
More than 2 major exams?	53	26	20
Posting practice questions on the web	85	10	5
Lab visits were helpful	60	28	13
More regular?	55	32	13
Modules: were helpful in promoting understanding	60	23	17

Table 2. Students' responses to the two exam questionnaires.

Exam:	Agree		Neutral		Disagree	
	Exam1	Exam 2	Exam1	Exam 2	Exam1	Exam 2
Covered lecture material	38	78	29	18	34	4
Covered syllabus material	52	84	37	14	11	2
Covered material in assigned readings	63	86	29	12	11	2
Generally balanced	42	69	30	17	30	14
About the right length	58	78	20	15	23	6
Items clearly written	60	71	24	20	17	9
Straight-forward	52	76	28	17	29	7
Enough time	82	97	7	1	11	3
Performance reflects overall efforts in the course	22	36	29	22	49	25

There were no noteworthy differences between agreement and disagreement in the questions regarding exam length, question clarity, time, and candor of the questions for both exams. The average score of the final examination was 80.2%.

The first, second and final exam scores in all five disciplines were assessed by a multivariate analysis of variance with repeated measures. These analyses examined the magnitude of improvement in performance over the three exams. Results showed that there had been a significant improvement in students' performance in all five disciplines (Table 3).

Analysis of variance (F ratio $p<.05$) and Duncan's Multiple Range Test (global alpha=.05) of the final course's grades revealed significant differences in students' performance in the five disciplines. Dental hygiene students' performance was significantly different from that of the remaining four disciplines. Kinesiology students' performance was significantly different from that of BME and Others students. However, there was no significant difference between students' performance in the BME, LS&A and Others disciplines. Similar statistical procedures applied to the previous four years scores had confirmed the lower grades of the dental hygiene students but did not show consistent and conclusive differences in performance among the remaining four disciplines.

The class's mean final cumulative grade was 78.08 (SD ±13.59), while that of the previous four years combined was 77.13 (SD ±10.75). The difference in both scores was statistically insignificant.

A broad array of opinions was expressed by students in the "Comments" sections of questionnaires. Most of the comments emphasized responses to questionnaire items. The class meeting held immediately after the first exam was welcomed by many students as a positive approach that allowed them to interact with faculty, express concerns, and receive feedback on improving their study habits.

DISCUSSION

A common predicament associated with undergraduate anatomy courses is the large number of students with diverse educational backgrounds.[1] An important issue with many undergraduate anatomy courses is that they are usually lecture-based without an opportunity to reinforce content in a laboratory setting.[7]

The issues of academic heterogeneity among undergraduate students and the absence of anatomy labs were recognized in the undergraduate anatomy course offered at the University of Michigan Medical School. The diverse academic backgrounds of students has been reported to affect motivation for learning anatomy, thus many students consider anatomy merely a prerequisite for their graduate studies.[1] This is usually reflected unfavorably on their course performance, a known outcome that has been observed over a long period of time.

The instructional techniques that we introduced in the 2002 Fall semester in our anatomy course were intended to improve students' conceptual understanding and performance in anatomy. This is based on the concept that students' performance could be enhanced with frequent quizzing,[1, 2] the provision of lecture objectives,[2, 3] sufficient opportunities for students to interact with faculty and discuss concerns,[3, 4] interactive web-based tools for learning,[5] and by reinforcing relevance through lab visits and learning modules.[6]

In this study, the majority of students agreed that the lecture objectives were useful (80%); weekly quizzes (71%); and

Table 3. Comparison of students' mean performance in the first, second and final exams.

Discipline	Exam 1 Mean grade (%)	Exam 2 Mean grade (%)	Final Exam Mean grade (%)	*p* value
Dental hygiene	58.13	64.59	67.44	<.001
Kinesiology	69.39	76.67	76.32	<.001
LS&A (Literature, Science & Arts)	74.69	82.98	82.8	<.001
Biomedical Engineering	81.64	89.95	88.9	<.001
Other, e.g. pre-pharmacology	79.19	85.41	85.6	<.001
Overall	72.6	79.92	80.2	

posting the PowerPoint lectures presentations on the course's web (75%) reflected a significant satisfaction with these techniques (Table 1, Figure 1). Students were more content with course exams following the introduction of these measures (Table 2). The statistically significant improvement of the entire class exam performance and in each of the five different discipline groups (Table 3) reflected an objective benchmark for the effectiveness of these measures.

The significant differences in students' performance in the five disciplines proved by the Analysis of variance reflect an interesting finding. We think that this could be attributed to several factors that warrant investigation. These include: 1) the diverse academic level of students, the BME students are usually at the graduate level and hence are more experienced, while most of the dental hygiene and some of the kinesiology students are either in the freshman or sophomore levels, and 2) students differ in their prospective plans in taking this course. Dental hygiene and pre-pharmacology students (Others) take the course as a prerequisite and apparently are more concerned on attaining a mere passing grade. Students in the BME and many in the LS&A and kinesiology programs plan to start a more competitive career or apply to a medical school. They usually study hard to earn a high score and to understand anatomy for future relevance to medical study.

Comparison of the mean class performance during the past four years with that of Fall 2002 showed an improved trend that was not statistically significant. Nevertheless, such an outcome represents a modest initial success in implementing these techniques.

Plans have already been started in refining the application of these techniques. These include the early provision of lecture objectives, improving the course's web material, and introducing more structured lab visits and modules. Moreover, an exam bank that is based on item analyzed data that would be more effective in assessing students' comprehension is being established.

The initial positive outcome of this study encourages us to invest more effort in developing the new measures and in evaluating their effect on stimulating students' awareness in learning anatomy. The approach described here in addressing the issues of students' motivation and performance in anatomy could be utilized by other institutions offering similar courses. We hope that it will contribute to the general efforts aiming to enhance the effectiveness of anatomy instruction and facilitate learning.

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APPENDIX

Questionnaire on the Effectiveness of course teaching techniques

Please check the appropriate box:

	Strongly agree				Strongly disagree
	1	2	3	4	5
Lectures					
• objectives were helpful in studying for the course					
• should be 2 full hours with a short break at 11					
• PowerPoint presentations are helpful in promoting understanding					
• anatomical specimens at the end of the lecture were useful in promoting understanding					
• didactic presentations are helpful in understanding concepts					
• better have the last 30 minutes for discussion					
• Take Note books are also useful in labeling images					
Modules					
• The modules were helpful in promoting understanding					
Course Web					
• has been useful in promoting understanding					
• all course material should be regularly posted on the web					
• PowerPoint presentations on the web were helpful					
• posting practice questions on the web is useful					
• having discussions over the Coursetools web is useful					
Lab visits					
• Lab visits were helpful in promoting understanding					
• more regular visits to lab					
Quizzes					
• more frequent, e.g. weekly quizzes					
• using images as part of quiz questions					
• PowerPoint presentation of quizzes is useful					
• have quizzes on paper					
• quizzes should make up a higher percentage of the final grade					
Exams					
• should include a wider variety of question types					
• include images in questions.					
• questions are too many					
• questions should be based on unit objectives					
• more than two major exams before the final					

Comments:

Sleep Medicine Education Benefits Pharmacists

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ABSTRACT

At a regional continuing education conference for pharmacists, 278 attendees answered five questions before and after attending a seminar on important topics in sleep medicine. The purpose of the study was to assess the need for sleep medicine education and to determine the effectiveness of the seminar at the conference. On the pre-test, 80% of the pharmacists answered two or fewer questions correctly. After the seminar, on the post-test, 77% of the pharmacists answered three or more questions correctly. The results of this study indicate that continuing education seminars on sleep medicine are beneficial to pharmacists. In addition, this study provides evidence supporting the need for sleep medicine education in this group of health care professionals.

INTRODUCTION

Sleep disorders are highly prevalent, affecting nearly 40 million Americans.[1-3] In a national survey, approximately 35% of adults reported disturbed sleep.[4] With fatigue and sleep disorders on the rise,[5] it is important for health care professionals to understand underlying mechanisms of sleep. One of the primary healthcare professionals on the front line of patient care is the pharmacist.

In American culture, otherwise "healthy" adults with sleep problems are more likely to discuss their sleep disturbances with a pharmacist instead of a physician because of accessibility. Furthermore, some pharmacists perceive sleep aids to be the most misused over-the-counter (OTC) product available.[6] Pharmacists are in a unique position to recognize sleep problems[7] and to serve as advisors to patients.[8] Therefore, sleep medicine education is essential in these health care providers.

Since 1980, when the American Pharmacists Association recognized sleep as a growing problem in the United States,[9-10] some continuing education events for pharmacists have included sessions on sleep.[11-12] However, to our knowledge, the benefits of such sleep medicine seminars were not assessed. Furthermore, although previous studies have assessed sleep knowledge in nurses, medical students and practicing physicians,[13] no study to date, that we are aware of, has assessed sleep knowledge in practicing pharmacists.

The purpose of this study was to demonstrate the benefits of continuing education events featuring sleep medicine education and to substantiate the need for sleep medicine education in the pharmacy curriculum.

MATERIALS AND METHODS

During a regional conference for Contemporary Issues in Pharmacy, held in Florida, 278 pharmacists from around the state were evaluated on their knowledge of sleep medicine before and after a seminar. The individuals attending the conference were asked to take a pre-test, consisting of five questions, in order to assess their prior knowledge regarding sleep medicine. The pre-test was specifically designed to simulate scenarios attendees may see, or have possibly encountered, as practicing pharmacists.

Description of the Pre-Test

Before the speaker began, each individual was given a No. 2 pencil and one Scantron™ sheet. Participants were told that they should not fill in any identifying information. In this way, the data from the questions would be considered de-identified, thereby protecting the confidentiality of the participants. A projection slide reiterated the instructions. Each question was then projected on the screen. The speaker read each question aloud and asked the participants to choose the best answer from the projected choices (A-E). Sufficient time was given for the participants to read and mark their answer choice. The speaker did not read the answer choices so as not to influence the audience by intonation. Everyone was asked to keep their Scantron™

sheet since they were to be used for a post-test after the seminar. (See Appendix 1 for specific pre-test questions).

Description of the Seminar

The speaker then gave a 45 minute PowerPoint presentation entitled: "The Importance of 'Good' Sleep Healthcare for your Patients." The seminar covered factors that promote "good" sleep, with a particular emphasis on endogenous melatonin, the hormone secreted by the body that induces sleep.[1] In addition, various sleep disorders and recent significant sleep research, with potential therapeutic implications, were discussed. The seminar was the final talk of the day, given at 4:00 p.m. on Saturday, May 3, 2003.

The speaker began by defining what constitutes "good" sleep regarding quantity and quality. Individual variations in sleep patterns were examined with regard to age,[14-15] gender,[16] lifestyle and circadian rhythms.[17] Next, the typical endogenous pattern of melatonin secretion was described.[18] Emphasis was placed on two principles: 1) melatonin is secreted at night and 2) melatonin secretion is inhibited by bright light.[1,19]

The point was made that secretion of melatonin is controlled by genetic factors. Therefore, individual variation exists within the population regarding the amount of melatonin secreted and the timing of its secretion. In particular, some individuals are high secretors and some are low secretors. This difference is thought to correlate with heavy and light sleepers, respectively. In addition, the timing of melatonin secretion varies in individuals. Specifically, the rising of melatonin levels earlier in the evening correlates with early birds (advanced phase of secretion). The rising of melatonin levels later in the evening correlates with night owls (delayed phase of secretion). Since genetic factors are involved in the timing of melatonin secretion, time of day preferences for the morning or evening can be seen to run in families. Subsequently, disorders of melatonin secretion, known as circadian rhythms disorders, were described; specifically, Advanced Sleep Phase Syndrome (ASPS)[20] and Delayed Sleep Phase Syndrome (DSPS).[21] A warning was given to emphasis that DSPS is often misdiagnosed as depression.[22] Then treatments for circadian rhythm disorders were outlined.[19] Of course, the most effective "treatment" is for a person to maximize their time of day by adapting their lifestyle to fit their sleep-wake cycle. However, since this is not always possible, the most common treatments, utilized by sleep medicine physicians, are bright light therapy and OTC melatonin preparations.[23,24]

As an example of how the principles underlying melatonin secretion can benefit individuals, the results from a recent study conducted in night shift workers were presented. The results of the study showed that bright light exposure at night increased performance at work and wearing sunglasses on the drive home improved sleep of the shift workers, presumably by decreasing the inhibition of melatonin secretion.[25] In addition, based on recent findings in another study of shift workers, a warning was given that late night meals result in elevated triglycerides.[26,27] Factors affecting melatonin levels and sleep, such as caffeine, alcohol and various foods were mentioned.[28] Additionally, participants were told of findings from a recent study showing that caffeine, prior to a short nap, will increase performance.[29]

Jet lag was also discussed with an explanation of the most effective treatments. Emphasis was placed on resetting the body's internal clock before departure. This can be accomplished by using bright light to shift the sleep-wake schedule. Regarding westward travel, it is thought that delaying sleep a half hour to one hour each night is effective. Regarding eastward travel, OTC melatonin preparations have been found to be effective.[28,30]

In addition, important research discoveries concerning major sleep disorders were presented. Narcolepsy was described and a warning was given that narcolepsy may be misdiagnosed as insomnia; 50% of narcoleptics report disturbed nocturnal sleep.[31,32] Most importantly, the attendees were told of the recent discovery that narcolepsy is associated with a deficiency of the neuropeptide, hypocretin.[33] This finding has implications for new therapies such as hypocretin replacement therapy and using hypocretin levels as a diagnostic tool.[34]

The pharmacists were reminded that OTC melatonin is approved for use in insomnia.[35] However, this was quickly followed by a warning that OTC melatonin is contraindicated in patients with a history of depression. This is because OTC melatonin may intensify or exacerbate depression in these individuals.[36] Still, there are conflicting views on this point.

To emphasize the importance of sleep medicine research and the potential impact on new pharmacological agents, a recent study in patients with insomnia was presented. The results of the study showed that cerebral blood flow in patients with insomnia was significantly decreased in specific brain regions.[37]

An overview of topics covered in the seminar is shown below.

Seminar Topics:

- Sleep Hygiene
- Melatonin Secretion
- Circadian Rhythms Disorders
- Melatonin Replacement Therapy
- Bright Light Therapy
- Sleep in Shift Workers
- Effects of Caffeine and Performance
- Restless Legs Syndrome [38-40]
- Narcolepsy
- Insomnia
- Jet Lag

Prevalence values for the most common sleep problems were given.[4] To emphasize the importance of detecting sleep problems, the effects of sleep problems on everyday life were enumerated.[41,42] The pharmacists were reminded that they are on the front-line of healthcare. Therefore, they have the opportunity to make helpful recommendations and have the potential to make a difference in the lives of their clients. A handout with references was included in the course materials booklet for the conference.

Description of the Post -Test

After the seminar, participants took a post-test to assess how much information they retained. The same five questions used in the pre-test were projected and read aloud. The participants were again asked to choose the best answer (A-E). For the post-test, the questions were renumbered 6 through 10. In addition, since the attendees would be using the same Scantron ™ sheet they used for the pre-test, the answer choices on the post-test were rearranged. This was done to discourage anyone from changing their answers on the pre-test questions. (See Appendix 2 for specific post-test questions.)

RESULTS

The results of the pre-test and post-test are summarized in Tables 1 and 2 respectively. The results of the pre-test and post-test are graphically represented in Figures 1 and 2 respectively. On pre-test question one, a large number of the attendees responded that for jet lag they would recommend OTC melatonin (31%) or reset the body's clock (30%). However, after the seminar, on the post-test, the responses to question six showed that the majority of the attendees (44%) learned that both OTC melatonin as well as resetting the body's clock could be recommended for jet lag. In addition, a significant portion (33%) of the audience remembered that the body's clock can be reset by bright light exposure and therefore would be helpful for jet lag. When added together, the attendees who selected the correct answer (E = 33%) and those who chose the next best answer (D = 44%), the results show that 77% of the attendees retained the major points of the seminar.

Table 1. Results of Pre-Test

Question #	A	B	C	D	E
1	*31 %*	7 %	*30 %*	19 %	**12 %**
2	10 %	*30 %*	17 %	**19 %**	22 %
3	4 %	3 %	**37 %**	5 %	*50 %*
4	24 %	5 %	13 %	19 %	***37 %***
5	16 %	5 %	8 %	28 %	***42 %***

Percentages represent the proportion of attendees who chose answer A, B, C, D or E. Bold numbers represent the percentage of attendees who chose the correct answer. Italicized numbers represent the most frequently chosen responses.

Table 2. Results of Post-test

Question #	A	B	C	D	E
6	15 %	1 %	6 %	*44 %*	***33 %***
7	*37 %*	4 %	3 %	***45 %***	9 %
8	3 %	1 %	0 %	***96 %***	0 %
9	13 %	0 %	2 %	2 %	***83 %***
10	5 %	7 %	4 %	17 %	***67 %***

Percentages represent the proportion of attendees who chose answer A, B, C, D or E. Bold numbers represent the percentage of attendees who chose the correct answer. Italicized numbers represent the most frequently chosen responses.

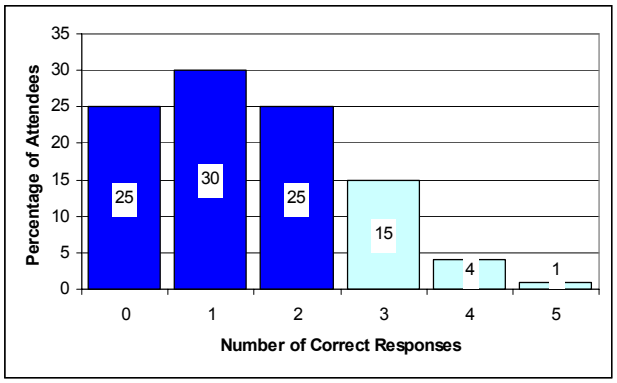
On pre-test question two, a large number of the attendees (30%) thought that narcolepsy was caused by excess melatonin. However, after the seminar on the post-test, the responses to question seven showed that many of the attendees learned that narcolepsy is caused by hypocretin deficiency (37%). Furthermore, a large number of the attendees learned that narcolepsy is also associated with autoimmune reactions (45%). Similarly to the first question above, when added together, the attendees who selected the correct answer (D=45%) and those who chose the next best answer (A=37%), the results show that a remarkable majority of the attendees (82%) retained the major points of the seminar.

On pre-test question three, a large number of the attendees thought that pregnancy would preclude the use of melatonin (50%). A significant number knew that depression would preclude the use of melatonin (37%). However, after the seminar on the post-test, the responses to question eight show that almost all of the pharmacists (96%) recognized that depression was the most serious condition that would preclude the use of melatonin.

On pre-test question four, a large number of the pharmacists (37%) recognized the major things that would be helpful to a nurse working the graveyard shift. However, a significant number of the attendees only recognized OTC melatonin as a potential benefit (24%). But after the seminar on the post-test, the responses to question nine showed that an overwhelming majority (83%) of the attendees were able to recognize the major things that would be beneficial to a night shift worker, such as a nurse on the graveyard shift.

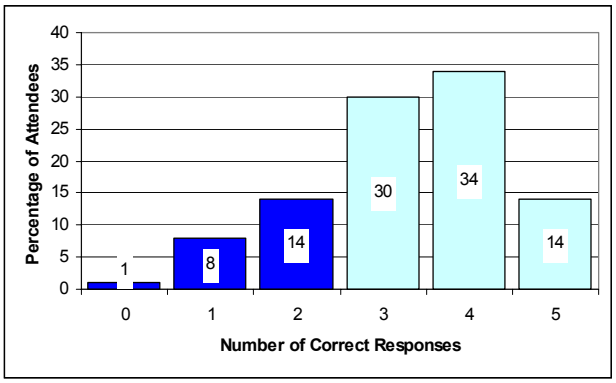
On pre-test question five, a large number of the attendees (42%) recognized major sleep problems that would benefit from OTC melatonin. However, a substantial number of attendees, indicated by the percentage of responses for choices A and D, were unaware that melatonin is used to

Figure 1. Responses to Pre-Test



Dark bars represent the percentage of attendees who chose the correct response on two or fewer Pre-test questions. Light bars represent the percentage of attendees who chose the correct response on three or more questions.

Figure 2. Responses to Post-Test



Dark bars represent the percentage of attendees who chose the correct response on two or fewer Post-test questions. Light bars represent the percentage of attendees who chose the correct response on three or more questions.

treat circadian rhythms disorders or they were unfamiliar with these types of sleep disorders. However, after the seminar on the post-test, the responses to question ten show that there was an increase in the number of individuals who understood that melatonin would be appropriate to treat these sleep problems. Ironically, 17% of the attendees failed to recognize that melatonin could be used for insomnia. However, added together, the results indicate that the majority of the attendees (84%) retained the major points of the lecture.

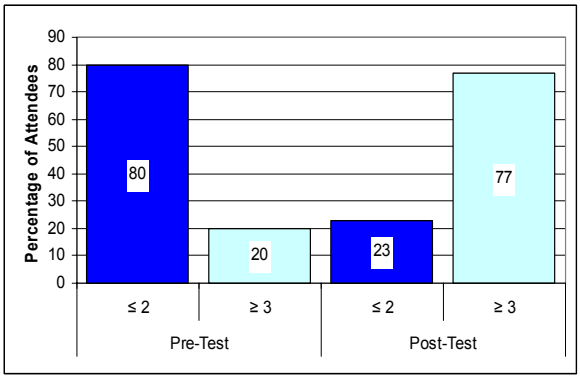
On the pre-test, nearly 80% of the participants answered only two or fewer questions correctly (Figures 1 & 3). In contrast, after the seminar, 47% of the participants answered four or five questions correctly and 77% answered three or more questions correctly (Figures 2 & 3). Even individuals having no correct responses on the pre-test significantly improved their knowledge of sleep medicine with 63% of these participants having two or three correct responses on the post-test. Furthermore, a comparison of correct responses between the pre-test and the post-test reveals a significant increase in the percentage of correct responses on the post-test. In addition, the format of the questions allowed the examiners to differentiate between individuals who retained the maximal information and those who mastered the major points, but missed the minor ones. Unfortunately, due to the limited number of questions, the test reliability number was low for the pre-test (0.40) as well as the post-test (0.39).

DISCUSSION

Although the amount of medical knowledge has increased exponentially, the medical curriculum has been unable to expand proportionally. Unfortunately, due to the time constraints of the medical curriculum, physicians are poorly trained in the area of sleep medicine.[43,44] Therefore, even individuals who voice their sleep complaints to their physicians are often misdiagnosed with depression and anxiety disorders.[22]

Similarly, topics pertaining to sleep medicine are minimal or dispersed throughout the pharmacy curriculum. For example, although the biosynthetic pathway of melatonin is usually covered in biochemistry, the pattern of melatonin secretion and its effect on sleep patterns is not discussed.[45] Also, time constraints in the general physiology course may preclude the discussion of the basic physiology of sleep.[46] Often, the extent of their training leaves the future pharmacist with only one doctrine: "melatonin induces sleep". The particulars of how and when this important hormone works are usually not covered.

Figure 3. Overall Results



Dark bar represents the percentage of attendees who chose the correct response on two or fewer pre-test questions. Lighter bar represents the percentage of attendees who chose the correct response on three or more pre-test questions.

The results of our study suggest that practicing pharmacists have had little exposure to sleep medicine education. The findings on the pre-test suggest that training in the area of sleep medicine is essential. The responses on the post-test indicate that the majority of the attendees were able to assimilate the major points from the lecture. In addition, the percentage of individuals who responded correctly to questions one and two on the post-test showed their ability to grasp the big picture, as well as sub points. Therefore, our study indicates that sessions on sleep medicine, similar to the one in our study, would be beneficial for practicing pharmacists. Furthermore, with the explosion of data being published in the field of sleep research, it is imperative that the topic of sleep be expanded in the pharmacy curriculum.

Although pharmacists are unable to diagnose sleep disorders, a basic understanding of sleep patterns and circadian rhythms is crucial. Knowledge of the body's melatonin secretion pattern would enable pharmacists to better advise their clients regarding their sleep problems. In particular, an understanding of the endogenous secretion of melatonin, and its possible individual variations would be extremely helpful when they discuss OTC melatonin preparations with their clients.

For example, night owls may be interested in taking melatonin to go to sleep earlier. The melatonin secretion in these individuals typically rises later at night. On the other hand, early birds may be interested in taking melatonin to go back to sleep because they arise earlier in the morning. The melatonin secretion in these individuals typically rises earlier in the evening and declines early in the morning.

Furthermore, melatonin secretion varies with age. Teenagers, for example tend to be night owls because their rise in melatonin secretion occurs later at night.[47] For this reason, studies are being conducted to reevaluate school start times.[48] In addition, melatonin secretion declines with age[31]. Therefore, melatonin replacement therapy may be beneficial in the elderly.[49]

More training will give pharmacists a better understanding of sleep and enable them to appropriately answer questions regarding OTC melatonin preparations and refer clients to sleep clinics when necessary.[9] With a focus today on promoting wellness, the importance of sleep should move to the forefront of healthcare. More importantly, over the past century, changes in lifestyle have made an understanding of factors promoting good sleep essential. Today there are more double-income families than ever before. Yet, the stressors in our daily lives have increased substantially. Therefore, being in "good" health is a matter of survival. By extension, a good night's sleep is one of the fundamental elements of good health. With over one-third of Americans complaining of disrupted sleep, it is essential that health care professionals be better trained in this area.

Various sleep medicine organizations have made efforts to educate physicians as well as the general public. For example, the National Sleep Foundation (NSF), in conjunction with the Sleep Research Society (SRS) will be hosting a conference at the NIH on March 29 & 30, 2004 (http://www.nhlbi.nih.gov/meetings/slp_front.htm). The American Academy of Sleep Medicine (AASM) has a series of excellent brochures which are aimed at patient education. Most recently, the pharmacy profession has begun to utilize online methods to provide continuing pharmaceutical education. An example of this type of article, focusing on insomnia, the sleep cycle and treatments, can be found at this website (http://secure.pharmacytimes.com/lessons/200306-01.asp). However, health care professionals must be made aware of these resources. For the practicing pharmacist, this could be accomplished with seminars, such as the one described in our study or through online continuing education endeavors as described above. Currently medical educators interested in sleep medicine education are working to develop a plan to integrate sleep topics into the medical school curriculum.[50] Hopefully in the future, the pharmacy curriculum will also be expanded to cover sleep medicine in more detail.

CONCLUSIONS

The design of the present study allowed the assessment of the baseline level of knowledge of sleep medicine in practicing pharmacists. The results of the pre-test indicate that prior knowledge of sleep medicine regarding melatonin was minimal and that sleep medicine education is needed. The results of the post-test showed that the majority of the conference attendees significantly improved their knowledge of sleep medicine by attending the seminar. In addition, the results of this study indicate that presentation of the material in a lecture format was an effective way of increasing the knowledge level of the attendees, regardless of their individual educational backgrounds. We hope the results of this study provide an impetus to include sleep medicine education as part of continuing educational events for pharmacists, and eventually as part of the pharmacy curriculum.

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APPENDIX 1

The PRE-Test consisted of the following five questions

1. What do you recommend for *Jet Lag*?

   A. OTC melatonin
   B. bright light therapy
   C. reset the body's clock
   D. A & C
   E. all of the above

2. Which of the following may cause *Narcolepsy*?

   A. autoimmune reactions
   B. excess melatonin
   C. hypocretin deficiency
   D. A & C
   E. all of the above

3. Which of the following conditions would preclude the *use of melatonin*?

   A. heart disease
   B. cancer
   C. depression
   D. diabetes
   E. pregnancy

4. A nurse on the graveyard shift asks you what could help her?

   A. OTC melatonin
   B. sunglasses driving home
   C. light at work
   D. avoid late meals
   E. all of the above

5. OTC Melatonin could be appropriate for which sleep problems?

   A. insomnia
   B. circadian rhythm disorders
   C. jet lag
   D. A & C
   E. all of the above

APPENDIX 2

The POST-Test consisted of the following five questions

6. What could you recommend for *Jet Lag*?

   A. reset the body's clock
   B. bright light therapy
   C. OTC melatonin
   D. A & C
   E. all of the above

7. Which of the following may cause *Narcolepsy*?

   A. hypocretin deficiency
   B. excess melatonin
   C. autoimmune reactions
   D. A & C
   E. all of the above

8. Which of the following conditions would preclude the *use of melatonin*?

   A. pregnancy
   B. diabetes
   C. cancer
   D. depression
   E. heart disease

9. A nurse on the graveyard shift asks you what could help her?

   A. sunglasses driving home
   B. OTC melatonin
   C. avoid late meals
   D. light at work
   E. all of the above

10. OTC Melatonin could be appropriate for which sleep problems?

   A. circadian rhythm disorders
   B. insomnia
   C. jet lag
   D. A & C
   E. all of the above

A Continuous and All-Level Educational Activity in Medical Ethics: "Problem Discussions"

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ABSTRACT

This article is based on the authors' experience with and observations of an academic activity entitled, "Problem Discussions in Medical Ethics", conducted by the Department of Deontology at Ankara University for more than 13 years. The overall scope of the presentations has actually proven to be more comprehensive than that of Medical Ethics as a definite academic discipline including topics such as medical education; nursing, dental and veterinary ethics; academic life in general;, and women's issues, which may or may not have a direct relationship with medical ethics. As another methodological point related to our activity, the meaning of the term "problem" is not limited to the event or single case level, but potentially represents many cases which form a group or set due to their similarities to be taken into account in the related ethical (and metaethical) discussions. Within the scope of the present paper, we consider first, the place of the problem solving approach in academic teaching as well as the importance of the continuous all-level discussions in medical ethics. We will discuss the activity in question in the light of a systematization of the topics presented and in that of our critical observations on the preparation and actualization of the presentations.

INTRODUCTION

The Importance of Problem Solving in the Teaching of Ethics

From both a methodological and pragmatic point of view, every human activity, can be seen as a "problem-solving" endeavor. Be it basically conceptual (philosophy), cognitive (basic science), applied health sciences (engineering), technical (technology), and other. To appreciate the problems, of a given academically based activity, we must see it in the light of its main methodogical aspects, including its subject matter, purpose(s)/aim(s) and method(s). Medicine, for instance, is an applied science, or science-based applied activity, with basic science being its necessary condition (or sine qua non), and man's health problems constituting its subject matter. The essential and overall purpose or aim of medicine is to find ways to cope with these problems. Its methods vary according to the medical discipline in question.[1,2] This is also necessary for an analysis of the related moral issues, as in the case of ethical discussions and research on morality -- we must inevitably be in a position to know the factual states of affairs, empirical context, in which the moral problems regarding medicine or its main, secondary, or tertiary divisions take place.

The ethical or moral issues in medicine, are dependent upon, if not directly derivable from, the properties of this activity's specific, scientific-technical methodologies, the characteristics of its main divisions -- basic medical sciences, preventive medicine/public health, clinical/therapeutic medicine, and their subdivisions, each having its own kind of submethods or techniques applied in the course of their realization. Furthermore, Medical Ethics as an academic discipline can be regarded as an interdisciplinary field, an intersection between medicine and ethics or moral philosophy. Understandably, however, as a subfield and in the last methodological analysis it is ethics and not medicine. It may thus be regarded as a "differentiated extension" of ethics into the medical area. The corollary is that the subject matter, purpose, methods/techniques involved in the activity of medical ethics are those of moral philosophy in principle, and, in accordance with the current more comprehensive use of the term "medical ethics", additionally those of human/social sciences involved in moral values and moral problems in medicine. There have been other[3,4,5,6] who also considered medicine from such an academic-methodological perspective.

In the context of the present article, we discuss the methodology of "Medical Ethics" from a pedagogical as well as methodological perspective. It must be stressed that although moral discussions (and judgments) are open-ended, which means that there would be no unanimity of opinion among discussants in a given case or set of cases, what matters in (Ethics and) Medical Ethics pedagogically is that the teacher in this field must be in a position to express his or her own stance in moral matters in a logically (coherent

and) rationally sound way.[7] Although there can in principle be no definite answers to be given to moral problems, and the teacher, as an individual as well as moral thinker, must express his/her own ethical decision making (as well as his/her moral views and judgments), giving, as far as it is possible in the moral sphere, his/her rationales.[8] Contrary to what we might call "neutrality thesis" as a generally held attitude in different areas of ethics education in our time, we believe that our approach represents good pedagogics, provided that he/she discusses moral issues sincerely and open mindedly with the students. For teachers as well as for learners, and generally speaking, education involves, a complex set of relationships which form a life-long, process[7,9] and this is an institutional and/or individual setting. This temporality involved in the educational process is one of the main aspects of this article as reflected in its title.

The importance of all-level academic discussions and interaction in medical ethics and the related areas

In this section we consider, the rationale(s) of the activity, which has taken place in our Department regularly as monthly presentations during the academic year for 14 years under the general title of "Medical Ethics Problem Discussions". Understandably, what such a title could signify would not at all be foreign to the reader of the Journal. Regardless it seems to be necessary to explain what we mean by the terms "all-level", "academic interaction" and "related areas" in connection with a series of activities on medical ethics in a related and "dynamic" university department.[10,11] First, the meaning of "all-level" is three-fold: the great variety in the age, academic title and the professional status of the presenters and participants; the variety of the specialties involved so far as their degree or level of academic technicality is concerned (pediatric surgery, forensic medicine, clinical psychology, and so on); and a variety in the subject matter of their presentations. Secondly, "academic interaction" means that as an established attitude in our meetings, we expect the participants and the presenters, to give their rationales in whatever they claim, be it (basic) scientific, logical, moral… and to whatever extent any one of them would be possible. Thirdly, the expression "related areas", or areas related to medical ethics may refer to dental, nursing and veterinary ethics, medical education, different aspects of academic life such as one's observations as a university administrator or the problems of women academicians; the relation of each one of academic fields or topics may differ from a methodological point of view.

Medicine is evidently not just a sum total of scientific knowledge and technical skill, but also includes, as a sui generis activity perhaps, inherent moral values. The latter is closely related to what has been known in our time as the "doctor's identity". This is understandable, because the doctor is "a (professional) moral agent". The acquisition of this identity is explained in two ways: the affect of the moral atmosphere in which the student finds herself/himself during medical education, and the observations of students as regards the attitudes and actions of the teaching staff, in

Table 1. Systematization of the presentations made at Medical Ethics Problem Discussions.

a. General, Methodological, Philosophical Aspects of Medical Ethics
   - "The ethical aspects of arriving at a diagnosis" (Physicotherapy)
   - "The problems of medical aesthetics from an ethical point of view" (Deontology)
   - "The distress created by the passive role in interdisciplinary work, with special reference to pathology" (Pathology)
   - "To be a woman: as a scientist, as a spouse, and as a mother" (Pharmacology)

b. Research and Publication Ethics in Medicine
   - General Aspects: "The ethical dimension of writing medical articles" (General Surgery).

c. Basically Socially / Publicly Oriented Topics in Medicine, and in Medical and Health Ethics
   - "The society and the tuberculosis patient with drug resistance: Whose responsibility?" (Chest Diseases)
   - "Ethical issues in family planning" (Medical Anthropology)
   - "Transsexuality from the viewpoint of Forensic Medicine" (Forensic Medicine).

d. Genetics and Ethics
   - "Medical ethics and the use of human gametes and embryos" (Family Medicine);
   - "The Lysenko case from the viewpoint of science ethics" (Deontology).

e. Clinical Ethics - Presentations Related to Different Clinical Branches and Topics
   - "Ethical issues in the application of radiodiagnostic visualizing methods" (Diagnostic Radiology).)
   - Psychiatric Ethics: "Alternative Medicine" in modern psychiatry and the related ethical questions" (Psychiatry)
   - "Psychiatry, torture and the physician's responsibility" (Psychiatry).)
   - The Ethical Aspects of Organ Transplantation

f. Various Ethical Issues in Medicine
   - "Physical Medicine and Psychiatry as two Clinical Branches Where Indeterminacy is Frequent" (Physical Medicine and Psychiatry).)
   - The Dead Body: "Ethical questions related to dead body from the viewpoint of psychiatry and forensic medicine" (Psychiatry and Forensic Medicine - two speakers.)
   - Death and Suicide as Topics of Medico-Ethical Interest: "The patient-doctor relationship vis-à-vis death" (Cardiology); "The impact of the media upon suicide attempts" (Clinical Psychology).)

g. Ethics and Medical Education
   - "Education of the physician and his responsibility in renewing himself, (Deontology).
   - "The teaching responsibility of the teaching staff" (Neurology).
   - "The education and identity of the life scientist" (Pharmacology)

h. Ethics and the History of Medicine as a Discipline
   - "Ethical issues in medical history, with the beginning of modern anesthesia as a case in point" (Anesthesiology).)

i. Other Subjects, Directly or Indirectly Related to Medical Ethics
   - Dental Ethics: "The three E's in dental medicine: Ethics, Esthetics, and Economics" (Dental Medicine and Deontology).
   - Nursing Ethics: "The ethical aspects of the care of the prisoner as a patient" (Pediatric Nursing)

j. Presentations as regards Personal Experience and Observations on Topics of Medico-Ethical Interest
   - "Being an academic administrator in a medical faculty and its problems" (General Surgery).
   - "The Physician Couple: The Ethical Dimension of Their Working Together" (Cardiology - two speakers -)

other words, the latter's overall role-playing. Judging by the variety of the participants so far as their field, academic status, professional experience and so on are concerned, however, it may be said that it is oriented, to the acquisition of identity in other academic professions as well. In our time, where the "mechanization" and even "dehumanization" of medicine are not infrequently mentioned expressions, the doctor is visualized as a professional who would not listen to, does not care much about, the patient, and who has alienated himself/herself from the society at large. This is certainly a justifiable observation, and to whatever extent it may be true, many determinants / factors seem to have been involved in it. In the present context, however, it may suffice for us to indicate that this state of affairs strongly implies a new shaping of medical education from the viewpoint of the future physician's moral values and communication skills, with an effective emphasis on an awareness and consciousness in ethics / medical ethics.

What has so far been considered is certainly a universal problem concerning in principle the institutions of medical education and the medical profession in all the societies. So far as our Faculty is concerned, we have recently begun to give graduate medical ethics courses to specialty and/or doctoral students in different departments, notably in psychiatry and pharmacology. Our regular monthly discussions on the ethical problems in medicine and related areas, as mentioned above and which we will consider in some detail below, may be regarded as a complementary activity in this regard, with its expected common "appeal" to participants of different categories.

A systematization of the topics presented

Here, we give an informative and sufficiently illuminatory systematics from the material at hand, with certain characteristic titles in most sets / subsets given as typical or "not so typical" representatives of them, together with the specialties of the presenters. In those cases where no example has been found worth mentioning in this context, the title of the set and/or the subset, would extent "speak for themselves" so far as the related ethical questions are concerned. We have formed the systematics by beginning with the most general subjects and ending with the basically special if not too specific ones. In any case, we cannot say that our overall outline of the topics / subjects of our program here could be the only and "ideal" systematics which one could create out of the material we had "at our disposal".

The presentations in question have not been ad hoc; instead, there occur weekly and often as "brown-bag" talks of certain academic circles in medical/biomedical ethics as informal if not necessarily unacademic interactions.

One might say that Table 1, together with the examples accompanying each item / set, would give a basic idea on the conceptual-academic scope and boundaries of the presentations made in the course of our regular monthly program (Table 1).

CONCLUSION

Critical Observations on the Activity from Academic and Psycho-social Standpoints

The qualification "all-level" in the title signifies the presence or active participation of the "representatives" of different generations of academic / professional life, with differences in their experience, understanding and approach, such as graduate students and research assistants, assistant and associate professors, professors, and other academic people with or without an academic title or degree. Mainly with the overall academic circles of Ankara University School of Medicine in mind, it has possibly had an audience of over 900 potential participants, who would be informed in time by a circular, in principle, about our regular activity taking place on a definite day of the month during the academic year (altogether seven meetings). In the course of time, more and more speakers have been invited from the academic, mainly medical circles outside our Faculty (but as a rule in Ankara). From the very beginning the overall participation in our activity has not been so high as we think it should, possibly with no more than 15 participants as an overall mean number per meeting, changing between a minimum of six and a maximum of 25 (not taking account the extreme cases on both ends). Undergraduate students have only occasionally taken part in the activity as participant, because we invited them, knowing their interest in certain topics of medico-ethical or social, or methodological interest.

Since its beginning in January 1989, the program has been prepared, first, on a monthly, and then semester basis; and for some years now, at the end of the previous academic year and announced in the beginning of the next. As for their actualization, there has been two gaps during the whole course of the meetings which have otherwise taken place regularly or without interruption, with such excuses as "forgetting" in one and "to have to do the clinical routine (surgical operation)" in the other. Interestingly, a rather young professor of psychiatry, who would speak on "the Ethical Aspects of Psychotherapies" according to the program, began his presentation with the question, "What should I really speak about now?"

A great majority of the speakers or presenters have been academicians from different branches of medicine and the related fields. In most cases, the speaker has made a presentation on a subject directly related to his/her specialty. In cases where a more general topic beyond the scope of his/her own limited field was presented, his/her role was that of a teacher, medical thinker, or an experienced academician with his/her different roles. Some presentations were made by more than one speaker, and it may perhaps be interesting to learn that in two cases the speakers were three young sister physicians.

A psychologically interesting and academically significant point arises from our observations on how some of the speaker candidates' reactions to our proposals to them, to make a presentation in the following academic year's

program in the medical ethics problem discussions. When the choice was of a candidate from among the "frequent guests" or "loyal participants" of our activity, he/she would normally accept our invitation with no or little, if any, hesitation. For some of those candidates who had little experience with presentations, discussions and the literature in medical ethics, and ethics in general, to think of themselves sitting in the presenter's chair could apparently give them a feeling of responsibility somehow hard to bear. Such candidates would try to give the excuse that they had no academic experience with the subject, and that, accordingly, "they did not know" ethics. When we tried to explain to them that for us ethical discussion, even in an academic milieu, would involve, rather than knowing, the expression of impressions and sharing of feelings and concern in moral issues which should be discussed on a case or set basis, with a clarification of ethical decision-making and moral reasoning in very different professional and/or academic situations, they would mostly be convinced and "accept the invitation". As we emphasized, the speakers did not at all need to speak in an academically technical language; what we expected from them could be very briefly put as "the sharing of concern in interhuman relationships in their respective areas of academic and/or professional life.

In spite of the fact that the overall academic and social atmosphere during the presentations in our program was apparently not a "formal" one, it was not "informal" either, using both of these words in their usual senses. Most speakers took their expected "jobs" or "missions" seriously from an academic-scientific point of view; and this even when, during the activity itself, humor was a significant component of their presentation and the following discussions. Furthermore, in recent years more and more speakers took their presentations even more academically, with some having a very successful systematics and content which appeared to be texts almost ready as manuscripts to be considered for publication in scientific/academic journals.

We wonder if a possible comparison of such non-routine academic activities between different educational and/or research institutions and countries could be realized in future studies, taking into consideration the different social, cultural, specifically institutional, and possibly other aspects.

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