



# *VitalSigns* | Learning About Our Learners

Office of Medical Education Research and Development

Fall 2000

## A New Look

This edition of *VitalSigns* marks a change. In the past, each edition focused on issues and outcomes organized under a broad theme relevant to medical education, such as basic science education, clinical performance and professionalism. In contrast, this edition presents a range of outcomes and indicators sampled across the undergraduate medical curriculum. The goal is to provide an overview of curricular outcomes highlighting both strengths and areas for improvement. Each edition also includes a spotlight section, focusing on a specific subset of outcomes. In this edition, CHM **admissions** is featured.

The outcomes included in this *VitalSigns* edition were abstracted from the annual CHM Outcomes Report. This report is produced by OMERAD and is distributed to administrators and department chairs at CHM. We hope that sharing this information in *VitalSigns*, which is distributed to all CHM faculty members, will better inform the College as a whole about our accomplishments as educators and our contributions to the profession.

In the future, we hope to move to a completely electronic version of *VitalSigns*, available via the internet. Past editions of *VitalSigns* can be accessed through the OMERAD webpage at <http://www.msu.edu/unit/omerad/vitalsigns/index.html>

## Evidenced-Based Assessments Tell Us How We Are Doing

In this issue, *Vital Signs* continues to take an evidence-based approach to basic questions about the College of Human Medicine. This issue focuses on CHM students and admissions. Dr. Christine Shafer, Assistant Dean for admissions, describes the processes used to draw a qualified and diverse student body, and the challenges CHM faces to maintain these traditions. We examine these empirical outcomes in the context of national trends in admissions, student progress toward graduation, and the practice profiles of our graduates. We note the contributions of CHM faculty in generating research on the process and impact of these medical education efforts.



The evidence we use to characterize trends in these outcomes draws on the diverse evaluation practices to which the College has made a commitment. Our experience in the most recent LCME self-study showed that CHM evaluation practices helped to address key internal and external questions about the immediate outcome and long-term impact of our curriculum.

CHM assessment practices that help to address key questions include the Student Performance Database, which enables tracking students' academic performance and the consistency of course and curriculum practices, and the Graduate Follow-Up studies of CHM alumni at two, six, and ten years after their graduation. These CHM-gathered sources are supplemented by external AAMC and AMA data in the development of CHM Outcomes Reports.

But commitment to new standards does not imply a break from the basic mission-driven challenge first posed for CHM when the school was founded, as indicated in a report on the CHM curriculum in *Science* in 1972:

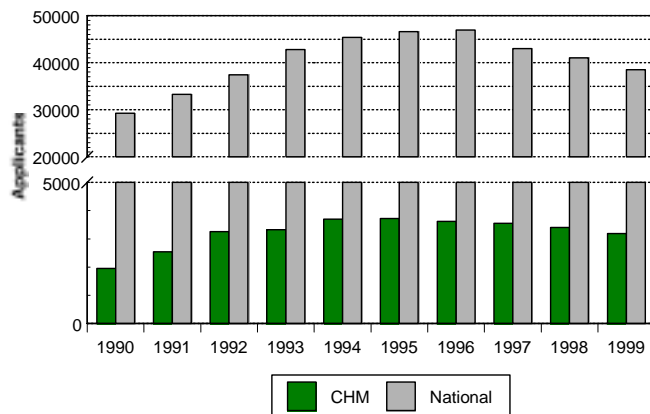
“The ultimate question, of course, is what kind of doctors MSU will produce. At MSU, however, there seems to be a genuine feeling that the prognosis is good for both the partnership between the medical schools and the communities.”

We are delighted to announce that Louise Arnold, Ph.D., Associate Dean at the University of Missouri - Kansas, has been named the Jack Maatsch Visiting Scholar. The award and her presentation will be held at CHM on May 14-15, 2001. For further information or for any comments about *VitalSigns*, please contact us at [Vitalsig@msu.edu](mailto:Vitalsig@msu.edu). We welcome responses from readers.

## Fewer Students Are Applying to Medical School

Since reaching its peak in 1996, the number of applicants to U.S. medical school has continued to decline. From 1996 to 1999, the number of applicants has decreased by 18% nationally. The trend among CHM applicants is similar to the national trend, although there has only been a 12% decline in applications since 1996. With fewer applications, medical schools must compete for qualified applicants.

### Application Trends: 1990 to 1999



A 1997 study by the Association of American Medical Colleges examined why some schools were less vulnerable than others to a declining applicant pool. At schools experiencing increased applications, incoming students rated the curriculum, teaching methods, residency placement, and schools' reputation as very important factors related to school choice. In contrast, students at schools with declining applications rated noneducational factors (tuition and location) as very important in their choice of school. This suggests that for schools attracting more applicants, geographic and financial considerations can be offset by a strong educational program.<sup>1</sup>

In 1999, CHM received 3,186 applications for a class of 106 students, a ratio of 30:1. This compares to 5,049 applicants for University of Michigan's class of 170 students (30:1) and 3,159 for Wayne State University's class of 253 students (12:1).

The table below summarizes demographic and educational characteristics for all applicants, accepted applicants and matriculants for CHM and the national pool for the class entering in 1999. CHM applicants were comparable to the national average with regard to demographic characteristics (women and under-represented minority status) and just below average with regard to their educational indicators (Grade Point Average and MCAT scores).

Applicants accepted for admission to CHM had stronger educational indicators than the total CHM applicant pool and included more women and under-represented minority students. The educational indicators of accepted CHM applicants closely approximated the national averages for accepted students.

Because many applicants were accepted to more than one medical school, the matriculating class historically has included a number of students drawn from the alternate list. The class entering in 1999 was typical for CHM in the diversity represented by gender as well as ethnic and racial minorities. Their educational indicators fell between those of the CHM applicant pool and accepted CHM applicants. These data indicate that some of the best students accepted to CHM chose to attend medical school elsewhere. This highlights the balance of educational and noneducational factors students consider when deciding which medical school to attend.

Class Entering 1999	All Applicants		Accepted Applicants		Matriculants	
	CHM	National	CHM	National	CHM	National
Total	3186	38529	170	17445	105	16221
Women	46%	45%	57%	46%	54%	47%
Under-represented minority	14%	11%	17%	11%	20%	11%
Science GPA (Mean)	3.2	3.3	3.5	3.5	3.4	3.5
Non-science GPA (Mean) <sup>2</sup>	3.5	3.6	3.7	3.7	3.6	3.7
MCAT Verbal Reasoning <sup>2</sup>	8.4	8.7	9.2	9.5	9.0	9.5
Physical Science	8.8	9.0	9.6	10.0	8.9	10.0
Biological Science	9.1	9.3	10.0	10.2	9.3	10.2
Writing Sample	O	P	P	P	P	P

<sup>1</sup>AAMC, Contemporary Issues in Medical Education, 1997; 1(2)

<sup>2</sup>MCAT scores for Verbal Reasoning, Physical Science and Biological Science range from 1 (low) to 15 (high); the Writing Sample is scored from J (low) to T (high).

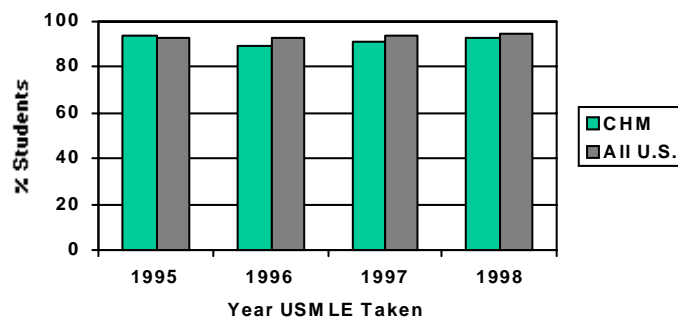
## CHM Graduation Rates Reflect National Trends

How well do CHM students progress through their training? In this article we examine the extent and pace of CHM students' completion of their preclinical academic program. We review these CHM outcomes in the context of national trends in student progress and attrition. Despite the decline in the number of applicants to medical school, the College of Human Medicine has continued to attract and admit cohorts of students who are academically prepared and represent diverse populations. In the last two decades national trends in the academic progress of medical students have changed. While most U.S. medical school students graduate in four years, the proportion of students who extend the time to graduation has increased. National studies show that the percentage of students graduating in five years has more than doubled, from 5.5% to 13.0%. In addition, the proportion of students who were still enrolled in medical school or were on extended absence after five years increased from 1.9% to 4.1%. The longer time to graduation was more likely to involve students who were older and students from under-represented minority populations. While some of the additional time can be attributed to students' involvement in research and additional study opportunities, extended graduation times more often reflect less adequate academic preparation and learning skills, resulting in greater likelihood that students will take less demanding academic loads and repeat courses and USMLE requirements.

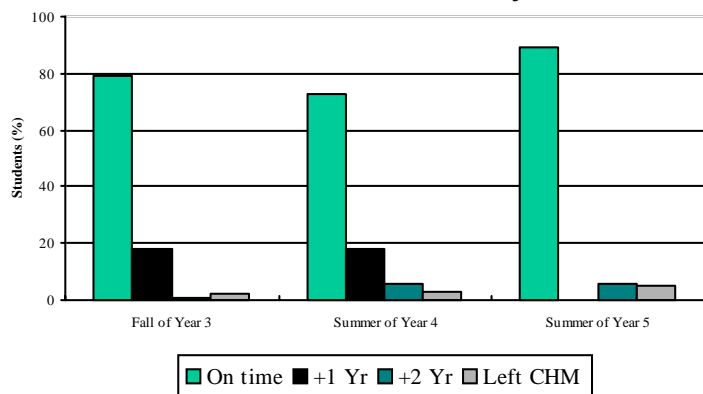
The figure (below) summarizes the academic progress of CHM students who have participated in our "new" curriculum—the 1992 through 1997 entry cohorts. As the figure shows, the majority of CHM students graduate

within four years. This figure also shows the extent of students who complete their program beyond four years or fail to graduate from medical school. By the fall of students' third year, the proportion of students who are projected to graduate within one additional year has ranged from 14% to 22%. The proportion of students who were projected to exceed this time to graduation was consistently 1-2% over these academic years. By the summer of their fourth year, the proportion of students who were projected to take more than one additional year to graduate ranged from 3% to 8% among these student cohorts. By the summer of the fifth year following students' entry, most students (88-91%) have graduated, with the proportion of students projected to take another year ranging from 4-8%. The progress to graduation in CHM follows the national trend in these areas. National data based on the matriculating class of 1992 show that, five years post matriculation, the percentage of students who have graduated from CHM is 89.8%, compared to 91.1% nationally, with 5.6% of CHM

### Students Passing USMLE I On First Try (%)



### CHM Students' Progress toward Graduation: Results for 1992 to 1994 Entry Cohorts



students still in school, compared to 5.1% nationally. As shown in the figure above, the percentage of students passing USMLE Step I on the first try has closely followed national trends during this period.

One bit of good news about this national trend of extended time of schooling is that this has also been found to be associated with a decline in attrition rates of under-represented minority students. Studies have suggested that this may reflect pacing of preclinical instruction in a more responsive and flexible academic load, and greater availability and use of academic support. But the longer periods of time until graduation clearly contribute to higher educational costs and debt loads for students.

## An Interview with Christine Shafer, *Assistant Dean for Admissions*

Dr. Shafer is an Associate Professor of Psychiatry and has been Assistant Dean for Admissions since 1998. This Fall, she was interviewed to share her thoughts about current issues in admissions, both at CHM and nationally.

**What criteria do you use to select students?** The committee remains focused on selecting students who will meet the mission of the College. We view the mission broadly, to include not only primary care but also serving the people of the state in all ways that are needed: clinical work in under-served areas, contributions to academic medicine. While selecting for primary care is a strong focus, we also look at people who are outstanding in other ways. To be selected, out-of state students must demonstrate that they will enhance the class or the profession. We continue to give high priority to Michigan residents.

**Are the classes diversified?** Yes, in many ways. We usually have about 20% under-represented minority students in the class. When all minority students are accounted for, that number reaches about 30%. This year about 26% of our students are from areas designated as rural. While we have many children of professionals, more of our entering students continue to be the first generation attending college than is seen at other schools. The number of women entering CHM has been increasing to a high this year of 60%. Our average student age - about 25 years - is

typical, but we do have many nontraditional students, including several with advanced science and non-science degrees.

**How do we find highly qualified students?** We have two programs that contribute directly to the class. Medical Scholars, our BA/BS-MD program enters ten exceptional college freshmen and about 80% matriculate at CHM, the others leaving the program for alternate career directions. Also, each year the committee identifies several under-represented minority and disadvantaged students who are highly desirable in experiences and other attributes yet are not academically ready for the challenges of medical training. These students are referred to the ABLE program. Typically, eight students are invited to participate in the 13-month program where success leads to entry into the CHM. We have one student from the recently established LANE Society, an enrichment program for talented minority MSU premedical students. We look forward to more of these students choosing CHM.

Many wonderful applicants are in the traditional applicant pool. Recruitment visits are made to colleges around the state and we host many groups here. Our students are excellent recruiters as they are strong supporters of the College. They visit colleges and premed clubs as well as lead tours and interview prospective students. There is the opportunity for informal recruitment in each contact the

faculty and alumni have with the public. Faculty make a tremendous difference by the contact they have with students during the interview process. Many more faculty are needed to interview!

**What is Interview Day like?** Applicants spend the morning in orientation including presentation of the curriculum, student services, and financial aid. They have a student-led tour and lunch with students. After lunch they have two interviews, one with a faculty member and one with a student. Applicants really like the people they meet here. They comment favorably upon their admissions experience and predict that it reflects how they will be treated as students.



CHM Admissions Committee discusses a medical school applicant

**Who sits on the admissions committee?** The admissions committee is made up of 14 members. There are ten faculty members and four second-year students on the committee. Like most other schools, our committee members are volunteers, but unlike many other admissions committees, we have diverse representation, including women physicians and under-represented minorities. In the past few years we have had faculty committee members from most of our community campuses sitting on the committee. The committee is cochaired by two faculty members. In addition, I attend the committee meetings as a nonvoting member. My role is to record the committee decisions on applicants as well as to keep the committee members informed about admissions policies and procedures, national trends and related issues.

**What is the impact of the high cost of tuition?** The impact is significant, both on the students who come to CHM and to those students with multiple acceptances who see it as a major deciding factor against considering CHM.

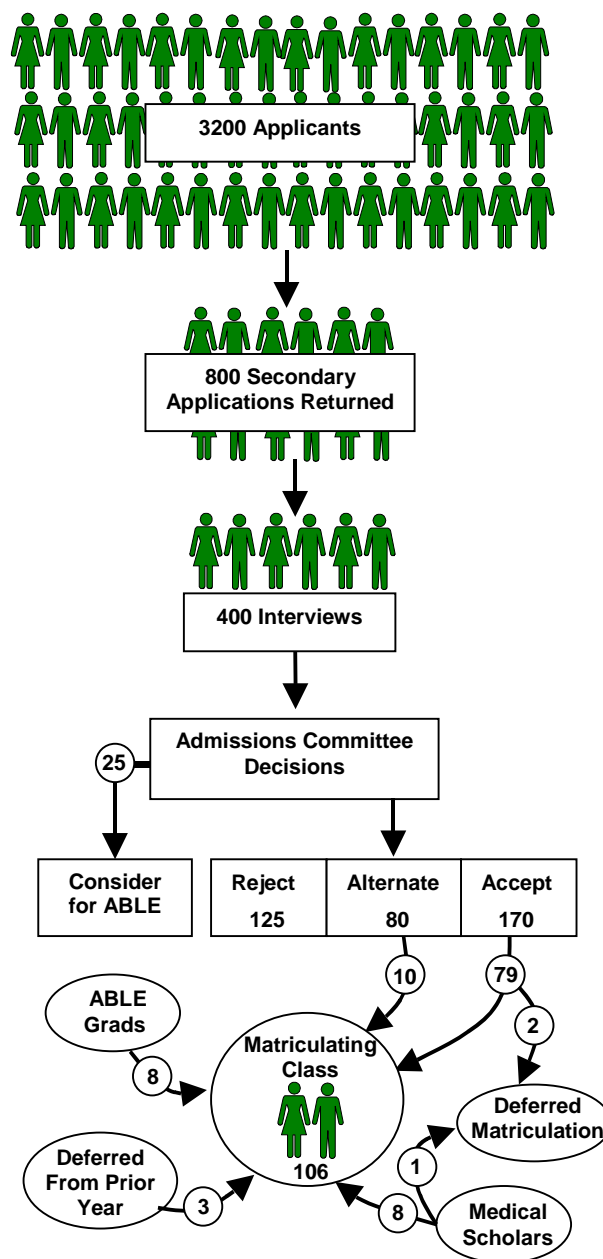
**What is on the horizon in terms of future challenges?** Our biggest problem is retention of the applicants we accept. We are part of a national trend of decreased applications to medical school. As we are coming off of an unprecedented high in the number of applicants in the mid-1990s and we continue to have a large number of qualified applicants, we are not yet concerned with the actual number of applicants. Loss of qualified minority in-state applicants is a huge problem; over 70% of the accepted applicants withdrew. Most of these students are from the greater Detroit area. For them, Wayne is close to home and less expensive. The University of Michigan is also familiar as well as having reputation and financial incentives. A similar profile is noticed when we look at the majority students who withdraw after acceptance. As a group they have a better academic profile than those who matriculate.

For more information about CHM Admissions, visit the web page at <http://www.chm.msu.edu/chmhome/admissn.htm>

For further information about medical school admissions nationally, check out the Association of American Medical Colleges at <http://www.aamc.org/stuapps/facts/>

### CHM Admissions Process

This diagram illustrates the process for developing a matriculating class at CHM. The numbers represent what has been typical for the last three entering classes.

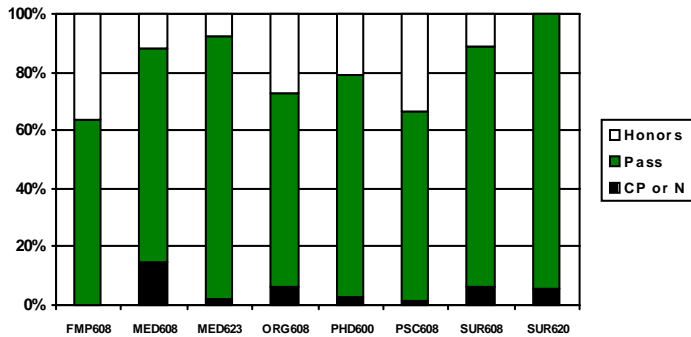


## CHM Students Close the Gap on USMLE Step 2 Performance

CHM’s unique community-based structure poses a number of evaluation issues for the clinical curriculum. These include whether grades are being assigned consistently across clerkships and communities and whether students are performing adequately compared to their peers at other medical schools. Each of these issues is addressed below.

The second figure presents average USMLE Step II exam scores for CHM students during academic years 1991-92 through 1999-2000. National averages are included for reference. CHM performance has risen sharply over the last two academic years and is now at the national average.

### Grades Assigned by Clerkship During 1998-99 Academic Year

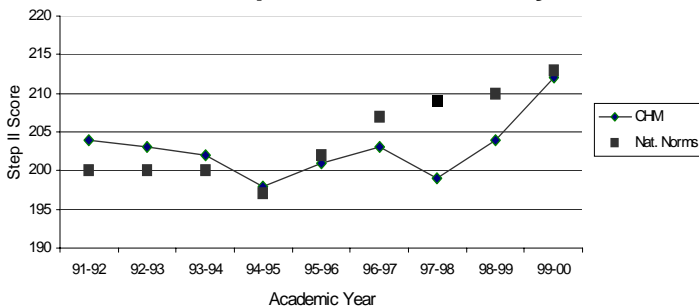


FMP608 Basic Family Medicine Clerkship  
 MED608 Basic Medicine Clerkship  
 MED623 Advanced Medicine Clerkship  
 ORG608 Obstetrics and Gynecology Clerkship  
 PHD600 Pediatrics and Human Devel. Clerkship  
 PSC608 Psychiatry Clerkship  
 SUR608 Basic Surgery Clerkship  
 SUR620 Advanced Surgery Clerkship

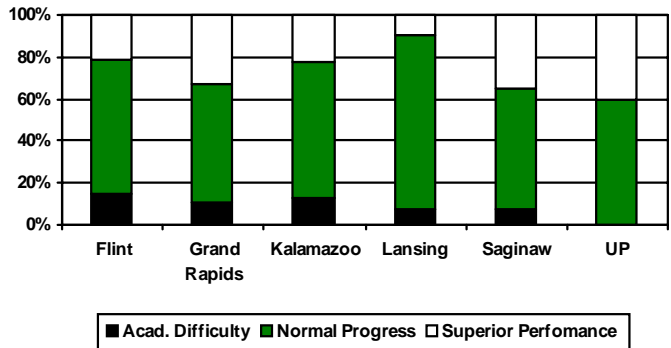
The figure above presents the percentage of students in each grading category in each of the required clerkships during the 1998-99 academic year. Only three “No Pass” grades were given across all required clerkships. These were combined with “Conditional Pass” grades in the graph.

As can be seen in the figure, there appears to be substantial variation in the grade assigned across the required clerkships. Both Family Practice and Psychiatry assigned approximately one third of the students honors grades while no honors were given in Advanced Surgery. Approximately 15% of the students received an N or CP grade in the Basic Medicine clerkship while no N or CP grades were assigned in Family Medicine.

### USMLE Step II Performance by Year



### Clerkship Performance Categories by Community



The above figure presents the academic performance of students within each of the six CHM communities over the last three academic years. Students listed with academic difficulty received either two “conditional pass” grades or a “no-pass” grade for their required clerkships. Students listed as making normal progress received “pass” grades and up to two “honors” grades for their required clerkships. Students listed as having superior performance received at least three “honors” grades for their required clerkships.

It should be noted that students are not randomly assigned to communities. Differences in performance between communities may reflect many factors including the entry characteristics of the students as well as the nature of the educational experiences they receive in the community.

Students in the upper peninsula campus have been performing quite well over the last several years with 40 percent receiving at least three honors grades in their clerkships and with no student receiving a “no pass” and/or two “conditional pass” grades. A large proportion of students in Grand Rapids and Saginaw, roughly 35%, also has received at least three honors grades in their required clerkships. Flint and Kalamazoo have the largest percentage of students with “no pass” or two “conditional pass” grades.

## Residency Directors Give CHM Graduates High Marks

**What Specialties Do Graduates Select?** To monitor one aspect of program impact, the College yearly collects information on residency selection and performance in the first year of training. Since CHM's founding, with its orientation to primary care, the National Residency Match Program (NRMP) data base has been used by the College to determine what specialties the graduates select. Despite some modest fluctuations, CHM consistently graduates physicians who demonstrate a strong preference for primary care. Nationally and for CHM, 1997 was the decade high

point for primary care when 57% of the nation's medical school graduates selected one of the primary care specialties. By 2000 the national percentage had dropped to 54% and declined every year since 1997. Many observers attribute the 1997 finding to several large scale demonstration programs as well as increased attention to the need for primary care providers. While some medical schools have reported a student "backlash" to the emphasis placed on primary care specialty choice, this has not been evident at CHM.

### Specialty of Initial Training Program of CHM Graduates

PROGRAM SPECIALTY	Graduates in the Class of			
	1996	1997	1998	1999
Family Practice	36%	34%	43%	24%
Internal Medicine	8%	13%	11%	18%
Pediatrics	11%	9%	8%	11%
Internal Medicine/Pediatrics	5%	7%	2%	8%
Sum--Primary Care Specialties	<b>60%</b>	<b>63%</b>	<b>64%</b>	<b>61%</b>
Obstetrics/Gynecology	7%	8%	10%	12%
Surgery	9%	10%	11%	10%
Other Programs	<u>24%</u>	<u>19%</u>	<u>15%</u>	<u>17%</u>
	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**How Well Do Graduates Perform?** Each year, CHM contacts the graduates' residency program directors to assess residents in terms of their broad clinical and professional skills. The survey also asks the directors to report whether they would renew the contract; extend the program; and consider the person for Chief Resident. The table below presents these assessments of our graduates, by their residency

directors, since 1996. Nearly all perform well in the first year, and many would be considered for a Chief Resident position. On the written comments section of the assessment form, residency directors frequently refer to our graduates' "strong interpersonal skills and enthusiasm". Occasionally the directors report the first year resident is overwhelmed by the clinical work load.

### Residency Directors Response to Questions

	Graduates in the Class of			
	1996	1997	1998	1999
Will you renew the Resident's contract? (% yes)	97%	93%	98%	96%
Will the Resident's program require extension? (% no)	95%	96%	97%	99%
Will you consider this Resident for Chief Resident? (% yes)	69%	71%	64%	74%

## A Sampling of CHM Education Program Related Publications

*CHM Faculty publish regularly about the curriculum and its outcomes. A sample of these publications is listed below.*

- Anderson, KD. The Ten Commandments of Logbook Development. *Focus on Surgical Education*. 1996, 14:23-24.
- Anderson, WA, Carline JD, Ambrozy DM and Irby DM. Faculty Development for Ambulatory Care Education. *Academic Medicine*. 1997, 72:1072-1075.
- Blue A, Elam C, Mavis B and Hoffman H. Computer literacy: A recommended skill for medical school applicants. *The Advisor*. 1999; 19:12-15.
- Kalaian HA, Mullan PB and Kasim RM. What Can Studies of Problem-Based Learning Tell Us? Meta-Analytic Tools for Synthesizing and Modeling Effects on National Board of Medical Examination I and II Performance. *Advances in Health Sciences Education*. 1999, 4 (3): 209-221.
- Kalaian HA and Mullan PB. Exploratory factor analysis of students' ratings of a problem-based learning curriculum. *Academic Medicine*. 1996, 71:390-392.
- Kumar K, Daniel J, Doig K and Agamanolis DP: Teaching of Pathology in US Medical Schools, 1996/97 Survey. *Human Pathology*. 1998, 29:750-755.
- Langford TW, Reznich CB and Erwin S. A computer "boot camp" for academic medicine faculty. *Academic Medicine*. 2000, 75(5):555-556.
- Lovell K, Mavis B, Turner J. et al. Medical Students as Standardized Patients in a Second-Year Performance-Based Assessment Experience. *Medical Education Online*. 1998, 4:1-6.
- Mavis B, Henry R, Hoppe R. et al. \$100,000 Shopping Spree: The Home Version. *Teaching and Learning in Medicine*. 1999, 11:44-47.
- Mavis B, Lovell K and Ogle K. Why Johnnie Can't Apply Neuroscience: Testing Alternative Hypotheses Using Performance-Based Assessment. *Advances in Health Science Education*. 1998, 3:165-175.
- Mavis B, Henry R, Ogle K and Hoppe R. The Emperor's New Clothes: The OSCE Reassessed. *Academic Medicine*. 1996, 71:447-453.
- Molidor JB and Campe JL. Once Upon A Time...The Use Of Narrative Story In The Selection Process. *Teaching and Learning in Medicine*. 1998, 10(2):116-122.
- Molidor JB and Duff J. Whatcha Gonna Do When They Come For You? Preparing Your Responses for Your Interview. *The Advisor*. 1998, 18:45-49.
- Mullan P, Werner A and Seagull E. Medical students attend to case-based psychosocial information: A prospective study. *Academic Psychiatry*. In print, 2000.
- Ogle K, Mavis B and Rohrer J. Graduating Medical Students' Competencies and Educational Experiences in Palliative Care. *Pain and Symptom Management*. 1997, 14:280-284.

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