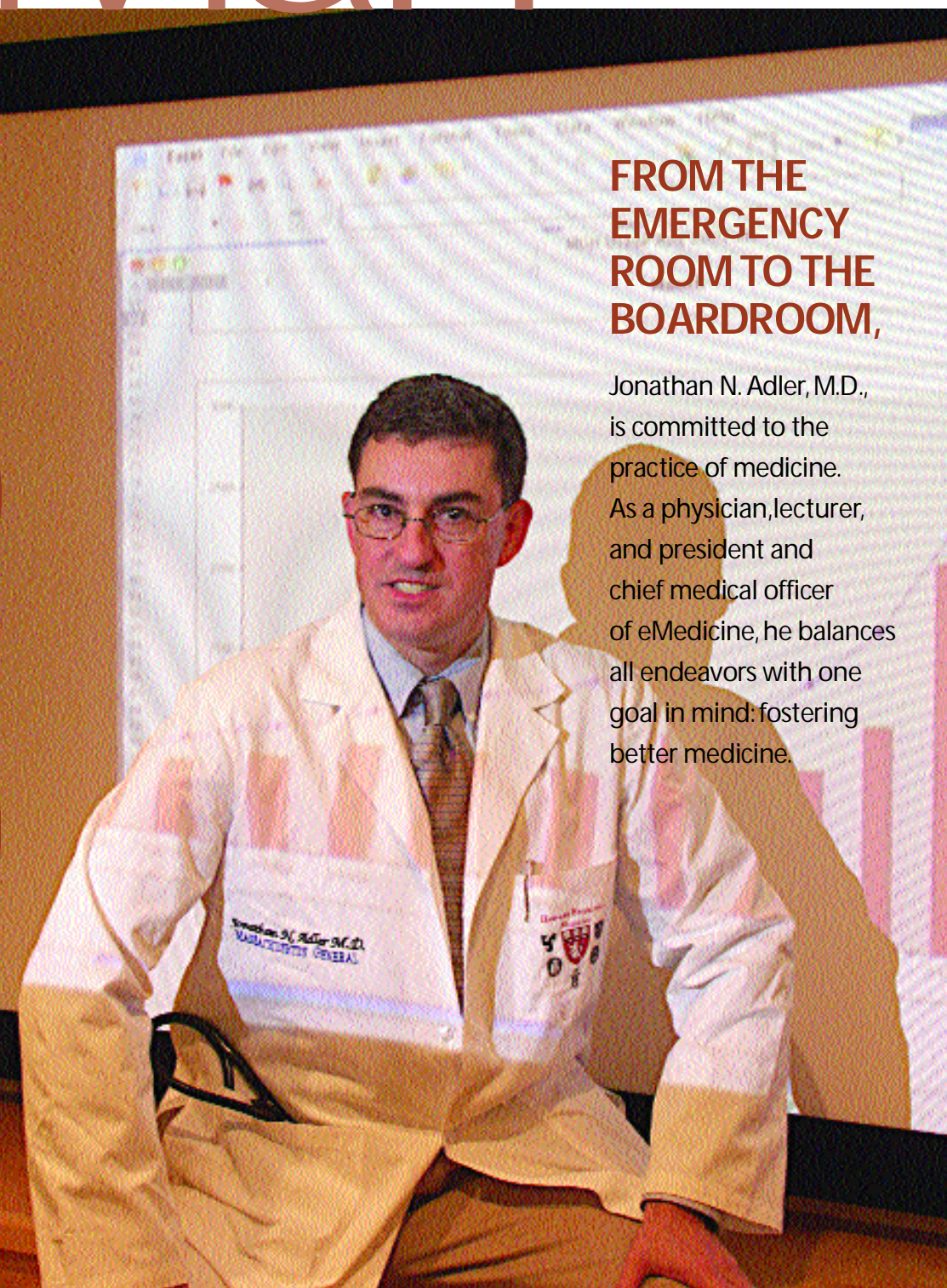


Man

MEDICINE



FROM THE EMERGENCY ROOM TO THE BOARDROOM,

Jonathan N. Adler, M.D., is committed to the practice of medicine. As a physician, lecturer, and president and chief medical officer of eMedicine, he balances all endeavors with one goal in mind: fostering better medicine.

My medical experience helped me



The demands of medicine mean physicians are required to spend many hours of their days absorbing the latest research on their own area or areas of expertise or conducting and offering research of their own. While it's one thing to remain current, it's quite another to take on the added challenge of passing on that information to students, other professionals, and the general public. Jonathan N. Adler, M.D., finds the time to do all that and more.

He works clinically as an emergency physician, gives lectures, and participates in the emergency medicine department at Massachusetts General Hospital, while also serving as president and chief medical officer of eMedicine, a Web-based clinical knowledge source for physicians and other healthcare professionals.

It's a difficult balance, Dr. Adler admits, especially since he also has obligations to his family. But it is a balance that he seems to manage with aplomb.

Uncharted **WATERS**

Throughout his career, Dr. Adler has shown a predilection for forging paths into new or less well-known territories. Before turning to medicine, Dr. Adler studied aerospace engineering. He credits this nontraditional background with giving him the ability to look at situations from a different point of view and to find unorthodox solutions to time-proven challenges.

Having made the decision to study medicine, Dr. Adler found himself drawn toward emergency medicine. Part of the attraction was his active nature. Another attraction was the newness of the discipline.

"Emergency medicine is the youngest specialty and at the time I started my training there were only 66 programs in emergency medicine in the U.S.," he says. After completing his training at Christ Hospital in Chicago, Dr. Adler set his sights on academia, and landed at Massachusetts General Hospital.

determine what tools needed to be created to improve

"At the time I joined the group there were no other residency trained emergency physicians on the staff," he says. "And while the hospital had been taking care of emergencies since 1811, it hadn't developed an academic emergency medicine program. I got to participate with a fantastic group of very enthusiastic and interesting colleagues to create a new residency training program."

On top of his vast experience as an emergency medicine physician and in teaching medical students and residents, Dr. Adler has had extensive experience writing and with editorial projects. After completing his residency training in 1992, Dr. Adler co-authored a book with eMedicine Founder Scott Plantz, M.D., FAAEM, on emergency medicine.

"With the book, 'Emergency Medicine Pearls of Wisdom,' we created a different format, one that was more firmly based in educational theory," he explains. "The book allowed people to learn facts, and to assimilate kernels of information into a body of knowledge, the purpose of which was to help people with board review exams or for residency-based training."

That book eventually became part of Boston Medical Publishing, from which eMedicine sprang. In addition, Dr. Adler was involved with writing and editing two emergency medicine books for Lippincott Williams & Wilkins.

Worlds **COLLIDING**

With his diverse background as a practicing emergency-medicine physician, in teaching medical students, and establishing the Mass General residency training program, and as a writer and editor of medical books, chapters and papers, Dr. Adler has been able to bring invaluable knowledge and experience to eMedicine.

"I've been very active in teaching both medical students and residents," he says. "I have been through the medical process myself, which helped me determine what tools needed to be created to improve the educational process. That experience was compounded by my involvement as an educator, working very closely with students and residents in training. Those experiences were instrumental in creating my view of what we wanted eMedicine to become as a learning and educational resource."

eMedicine is a cutting-edge tool that contains information on disease states, research, and cures and treatments for a wide audience. The site, which was launched in 1996, is described by the company as the largest and most current clinical knowledge base available to physicians and health professionals.

His experience as an associate editor for the *Journal of Emergency Medicine* helped Dr.

the educational process.

Adler identify the editorial process for eMedicine.

The appeal of eMedicine to healthcare professionals and pharmaceutical companies is the quality of its product, and, as chief medical officer, one of Dr. Adler's primary roles is quality control. To that end, he supervises the peer-review process, and has been involved in the creation of tools to improve the standard of topics covered.

"At the outset, we felt it was important to have accountable peer review," he says. "Scientific journal articles usually use blinded peer

review, so authors don't know who reads their material. We believe in the reverse, which is accountable peer review, so authors know who their editors are, editors know who the author is, and the names of all appear on the article. The editors have more accountability, and because this is dynamic con-

tent, they are obligated to make sure it's current, maintained in good shape, and is accurate."

Professional users can e-mail the editor and

into new or less well-known territories.

forging paths



Jon Adler has shown a predilection for

A 360-degree perspective

IN AN EXCLUSIVE INTERVIEW WITH PHARMAVOICE, JONATHAN N. ADLER, M.D., PRESIDENT AND CHIEF MEDICAL OFFICER OF EMEDICINE, PROVIDES HIS VIEW OF THE HEALTHCARE INDUSTRY.

HOW WOULD YOU DESCRIBE THE STATE OF THE INDUSTRY?

These are wonderful times. There have been unbelievable developments and improvements in terms of evaluation and treatment and even basic understanding of medical diseases that physicians in an earlier time just weren't fortunate enough to have. Coupled with that is the explosion of digital technology. Part of what I find very satisfying is being able to create something like this resource, eMedicine.

WHAT ARE SOME OF THE BIGGEST CHALLENGES FACING THE INDUSTRY TODAY?

The first is hubris. There is a natural tendency because of the wealth of information, new drugs, and new treatments to think that we're really getting somewhere. But there are many diseases we don't fully understand, that we can't treat, that are still causing tremendous morbidity and mortality on a worldwide basis; we have a long way to go. There are other practical issues. It's wonderful to create great diagnostic and treatment capabilities, but these are all tremendously expensive and represent a huge drain on resources. Very rich countries can somehow moderately manage to afford healthcare, but for the rest of the world these innovations still are very inaccessible. The tremendous cost of healthcare is the second-largest challenge.

IN YOUR CAREER, WHO HAS HAD THE MOST SIGNIFICANT INFLUENCE ON YOU?

My adviser as a graduate student at the University of Colorado in Boulder was Dr. Marvin Luttgies. He was bright and patient and lenient and he had a tremendous ability to let us, as graduate students, muddle through on our own. He didn't tell us how to do everything, which he was fully capable of doing. That really provided an educational foundation. We had to figure out how to solve problems. He was a very big influence on me and unfortunately he passed away at a very young age.

Dr. Alasdair Conn, who is the chairman of the emergency department at Mass General, has been a very positive influence on me, both in the clinical setting because of his ability to remain calm under fire, and as a role model in an administrative area, because he's very good at what he does. He's encouraged me to pursue the things that I've wanted to do, including eMedicine, even though it's made me less available to the department. He gave me tremendous opportunities. All the things that I was able to pursue, were positions that came from him.

AS THE RECIPIENT OF NUMEROUS AWARDS, OF WHICH ARE YOU THE MOST PROUD?

In medical school I received, two years in a row, the Creative Contribution to the Field of Medicine from the Adler Foundation – no relation. I had come up with a novel line of research to investigate. That probably, on some level, helped encourage me to realize I could start to think outside the box, and not be afraid to pursue lines of research or ideas that are a little different.

In the first year of our newly established residency training program at Harvard, I received an award for Best Role Model from our residents.

That had a lot of personal meaning to know that the people I was working with and training viewed me as a role model.

author directly. "I see those e-mails," Dr. Adler says. "So if there's a problem with the topic, or any concern about the quality or accuracy, we can address that right away."

Dr. Adler also created an evaluation system so all professionals can score each article.

Responsibility for handling the large volume of data associated with the eMedicine project was not completely new to Dr. Adler. His duties as associate program director of Massachusetts General Hospital, Harvard Affiliated Emergency Medicine Residency involved a huge administrative challenge — ensuring that 265 hours of educational time throughout the year was allotted, planned, and slotted.

"That ended up being good cross-training for the eMedicine project because of the volume of content," he says. "eMedicine is obviously much larger and complex, but that previous experience was very good in terms of learning to manage large projects that require attention to detail."

Dr. Adler describes the creation and development of eMedicine as one of the "largest collaborative educational healthcare projects undertaken." The eMedicine Clinical Knowledge Base provides coverage of 7,000 diseases and disorders, and includes contributions from almost 10,000 physician authors and editors. The evidence-based content provides practice guidelines in 62 medical specialties, and is kept current around the clock. All of eMedicine's original content undergoes four levels of physician peer review plus an additional review by a Pharm.D.

"It's tremendously satisfying to play any role in helping elevate the quality of care that's being delivered to patients," Dr. Adler says. "That's what it boils down to in terms of eMedicine's role in healthcare."

eMedicine, which can be viewed at emedicine.com, began as part of Boston Medical Publishing. The Website's first work was the Emergency Medicine Volume, a conglomeration of 735 articles with about 500 contributing physicians. The project, which took a little more than a year to bring to fruition was, Dr. Adler says, the turning point for the company.

The genesis behind eMedicine was to provide healthcare professionals with current, accurate, credible medical information that physicians and the public could use to make better medical decisions.

"The fundamental problem that we were addressing was a need for current content," Dr. Adler says. "Text books are out of date the day they reach the bookstore shelf. We wanted to create a new entity that would fill that need for comprehensive content that summarized the current understanding about a medical condition."

Dr. Adler credits Dr. Plantz, eMedicine founder, and Jeff Berezin, the chief technical officer, with leveraging the power of the Web to create an authoring environment.

"Because the content is on the Web, we are not constrained by page length or image size, which limited other publishing means, and can create search tools and other capabilities that allow people to access what they want," he says.

The goal from the beginning, he notes, has been to present information in such a way that professionals can glean the data they require without being forced to wade through exhaustive references.

"The analogy that I use, because of my experience in aerospace engineering, is of a fighter pilot," he says. "A fighter pilot has plenty of information at his finger tips — a wall of gauges and dials and instruments. But sometimes a critical decision needs to be made quickly. There's a heads-up display, which summarizes the information needed. The pilot can choose the data he wants displayed in different circumstances, and can rapidly get to the kernels needed to help him

take action. That's what eMedicine was designed to do — allow people to quickly access data of interest."

Dr. Adler's central role in establishing eMedicine as a highly respected, much-tapped resource has earned him enormous respect.

"Jon has done three critical things to help bring eMedicine to where it is today," says Deryk Van Brunt, Dr.PH, eMedicine's CEO. "One has been the recruitment of highly qualified physicians; two has been to create a structured definition of how evidence-based content should be generated; and three was formulating a system to maintain that content — and this is huge because no one has ever done it before."

eMedicine continues to be a work in progress. In late August, the company rolled out its new user interface making the content easier to access and more understandable.

"We're at a great transition — we're starting to look at becoming profitable," Dr. Adler

Parallel pursuits

JONATHAN N. ADLER, M.D. — RESUME

EMEDICINE FORMATION

1997 TO PRESENT. President and chief medical officer, eMedicine, which was spun off from Boston Medical Publishing in 1997. Involved in developing eMedicine's proprietary publishing system. Begins authoring and editing eMedicine's first book

1992 TO 1993. Establishes Boston Medical Publishing with Dr. Scott Plantz. BMP's first book published.

ACADEMIC APPOINTMENT

1993. Instructor of Medicine, Harvard Medical School, Boston

HOSPITAL APPOINTMENT

1993. Assistant in Emergency Medicine, Massachusetts General Hospital, Boston

ADMINISTRATIVE APPOINTMENTS

1994 TO 1999. Associate Program Director, Massachusetts General Hospital, Harvard Affiliated Emergency Medicine Residency, Boston

1994 TO 1998. Course Director, Emergency Medicine Senior Clerkship at Massachusetts General Hospital, Boston

EDITORIAL POSITION

1998 TO 2001. Associate Editor, *Journal of Emergency Medicine*, Elsevier Science Inc., New York

EDUCATION

1988 TO 1989: General Surgery Internship, Emanuel Hospital, Portland, Ore.

1988: M.D., University of Colorado School of Medicine

1983: M.S., University of Colorado College of Engineering Sciences (Aerospace Engineering Sciences)

1980: B.A., University of Colorado College of Arts and Sciences

POSTDOCTORAL TRAINING

1989 TO 1992: Emergency Medicine Residency, Christ Hospital and Medical Center, Oak Lawn, Ill., Affiliate with Rush Medical College, Chicago

says. "The next stages for us are to continue to evolve the content, our working relationship with the corporations, and enhance the user experience," Dr. Adler says.

In addition to the new user interface, the company plans to roll out a natural language search function, a "fuzzy logic" search feature, wireless access, and enhancements to its PDA and Palm download functions.

Another innovation, which Dr. Adler says he had a modest role in enhancing, is the group publishing system, or GPS, a patented software technology.

"Through GPS we can interact with all the content, add authors and delete authors, add topics, assess how everyone is coming along, and set the progress and e-mail all the authors and editors who are involved in the approval process," he explains. "Through this process we have a wonderful area — a book control center — which in part has allowed us to leapfrog past traditional publishers."

Finding **RESOURCES**

Because eMedicine reaches such a vast audience, it has become an attractive source for the pharmaceutical industry to reach out to physicians.

Part of eMedicine's funding is derived from investors, part from subscriptions and sales, and part from corporate sponsorship. One of

eMedicine's first investors was Tenet Healthcare, which owns about 129 hospitals in the U.S. A subsequent round brought funding from Omnicom, a holding company, and HIG Capital, a venture capital fund out of Florida.

In addition, there are corporate sponsorships from a number of pharmaceutical, biotechnology, and device manufacturers.

"Since we have relationships with our physician users, corporate sponsors can take advantage of that relationship to help them educate people about their products and offerings," Dr. Adler says.

Through this relationship with a large number of contributing physicians, one of the things that the company is starting to explore is ways to help pharmaceutical companies reach this audience by helping sponsors create their own content, or educationally directed materials or continuing medical education.

"As the site continues to evolve and the relationships with the companies evolve we'll find more and more ways to work closely together," Dr. Adler says.

Another innovative partnership collaboration is eMedicine's integrated microsite.

"A corporate sponsor can place its active Website — albeit somewhat smaller than the average Website — within the medical content," Dr. Adler explains. "It's all above board, it's clearly identified as sponsored-advertising material. This information benefits our users because when they go to an eMedicine article, they usually are on a mission. The user may see

some information that they would like to pursue while they're reading specific content. Users seem to like this. They're accessing the content, they're clicking onto the sites."

Some of those integrated microsites have been developed through in-house interaction with corporations, while others are the result of a relationship with agencies, such as i-Frontier, an online ad agency that works primarily in the pharmaceutical arena.

As well as the microsite, eMedicine offers an opportunity to pharma companies to sponsor an entire specialty area.

A third source of revenue for the company is iMedicine.com, the subscription model of the site. "We have about 120 institutions that currently subscribe to the institutional offering," Dr. Adler says.

A fourth, and still growing source of revenue for the company is sale of CME content via Palm or PDA download.

Through the company's medical education center, it offers about 40,000 hours of medical education credits, including 10,000 Category 1 AMA PRA CME for physicians, 10,000 CEs for nurses, 10,000 CEs for pharmacists, and 10,000 OCEUs for optometrists. In the future, eMedicine also plans to offer CEHs for pre-hospital providers, respiratory therapists, and physical therapists. ♦

PharmaVoice welcomes comments about this article. E-mail us at feedback@pharmalinx.com.

eMedicine: A resource for healthcare professionals

THE GOAL

To provide healthcare professionals with the information they need, at the point of care, to make sound clinical decisions that will improve outcomes, save lives, and deliver cost-efficient care.

eMedicine's products represent a vast educational repository that empowers physicians and other medical professionals to make better decisions at the point of care, and to support their medical and clinical research. Knowledge delivered at the point of care can reduce errors, enhance patient safety, and reduce medical costs.

TARGET MARKETS

Physicians

- About 95% of physicians are online (524,000 users).
- They regularly use the Internet (average 5.4 hours per week).
- They use the Internet to search literature databases (81%), search for information about drugs (66%), and take CME courses (45%).

Institutions, including hospitals, medical schools, government, and military

- More than 6,000 U.S. hospitals, of which only 5% use online clinical-

management systems. Implementing decision-support systems is the major goal of most hospital systems.

Products

- **Clinical Knowledge Base** — 7,000 evidence-based, peer-reviewed articles covering 62 specialties, with each chapter undergoing five levels of peer review, including four physicians and one Pharm.D.; 10,000 academic physicians recruited; 85% of editors are program directors, department chairs, research directors and/or journal editors.
- **Point-of-Care Tools** — streaming more than 30,000 multimedia/images, 100 clinical calculators, DDX search allowing users to type in symptoms and get differential diagnoses, PDA and wireless applications for high portability.
- **Patient Education Material** — 500-plus disease-specific chapters and current articles, which are physician authored and peer reviewed.
- **Continuing Education** — 40,000 hours of CE for physicians, nurses, pharmacists, and optometrists; more than 6,500 category 1 CME courses.
- **Distributed Publishing and Knowledge Tools** — guideline, protocol, and formulary agents.