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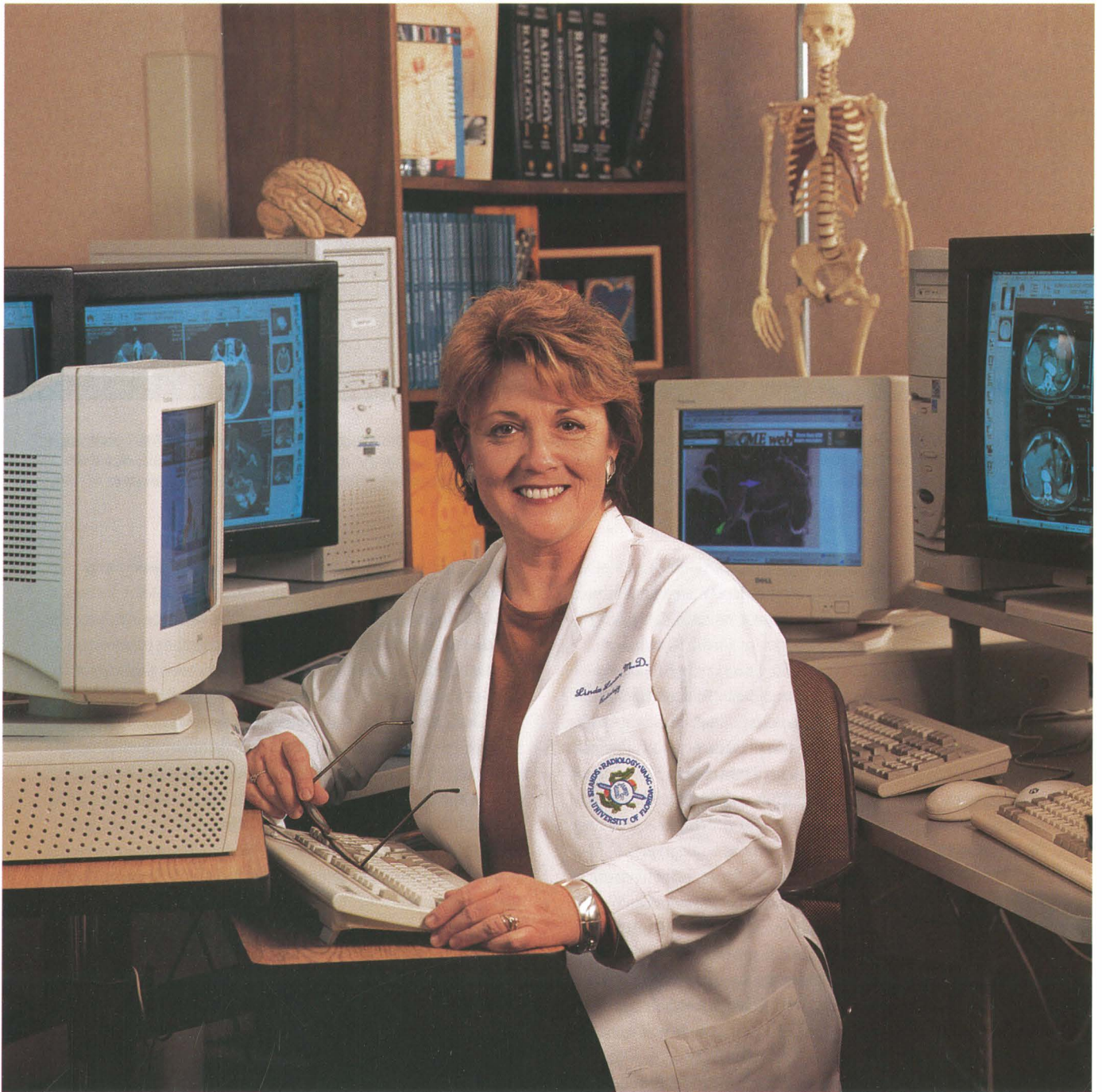
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Images of Success

THROUGH HER WORK IN ELECTRONIC PUBLISHING, LINDA LANIER PROVIDES A WEALTH OF MEDICAL RESOURCE MATERIAL TO PHYSICIANS, HEALTH-CARE STUDENTS AND CONSUMERS ALIKE.

By Susan Hensel Dixon, APR

When Linda Lanier, M.D., began teaching in 1989, scarcely more than 100 medical students enrolled in her courses. Now, through the electronic publishing company founded by a former student, Lanier's classroom population is measured in the millions.

Lanier, a 1971 Furman graduate, is a tenured associate professor of diagnostic radiology at the University of Florida College of Medicine in Gainesville, with expertise in mammography and women's imaging. In May of 1999, she took on a second job as executive producer of the Integrated Medical Curriculum for Tampa-based Gold Standard Multimedia (GSM).

Four days a week, Lanier works with medical educators all over the world, helping them publish their work electronically for audiences of health-care students, professionals and consumers. While the job of executive producer may seem to be somewhat out of character for an academic physician, Lanier's new role fits her as precisely as a compact disk in a computer's CD drive.

"I've always had a wide range of interests and an amazing array of opportunities in my life, and I've always been willing to explore them," says Lanier with unmistakable enthusiasm.

Charting a new course

The origins of her latest venture go back to 1990, when Lanier began teaching radiologic anatomy at the University of Florida. Lanier points out that Florida was the first school to offer the course, a first-year, first-semester medical school class designed to introduce students to diagnostic imaging and to teach anatomy through the study of CT scans, X-rays, sound images, plain film radiographs and contrast studies.

"Before we began offering it, students learned about radiology indirectly from ward experiences or physician sources other than radiologists. The first formal course in radiology they could take was a senior elective offered in the fourth year," she says.

Because no textbook for the course existed, Lanier had to design the teaching materials herself, developing a library of film reference images for students to use. This collection of images sparked the imagination of first-year student Jon Seymour.

"Students had to share the images," recalls Seymour, now an M.D. and chairman and president of Gold Standard Multimedia. "There weren't enough materials to go around. Plus, they were oversized and unwieldy. That's when I realized it would make sense to put the materials into a multimedia format."

"Jon came up to me and asked if I would be interested in capturing the images from my course on videodisc so they could be accessed on computer," adds Lanier. "Now it seems like ancient technology, but at the time it was very avant-garde."

What began as an effort to collect materials to teach a course ended up being a three-year project. Lanier's co-authors for the course were Seymour and Richard Rathe, M.D., a Florida faculty member and computer informatics expert.

When Lanier and her colleagues first demonstrated the multimedia program at a meeting of the Radiologic Society of North America, it attracted much positive attention and received the organization's Cum Laude award. "We were astounded at the interest in it," she says.

The computer-aided instructional program was so unique that it was selected

by Apple Computer, Inc., for a national tour during its "Higher Education Briefings" in 1993 and 1994. It also received a second-place award at the 1994 World Congress on Biomedical Communications Media Expo and was chosen for permanent display in the National Library of Medicine in Washington, D.C.

"Producing Radiologic Anatomy opened my eyes to the possibilities of multimedia technology applied to medical education," says Seymour.

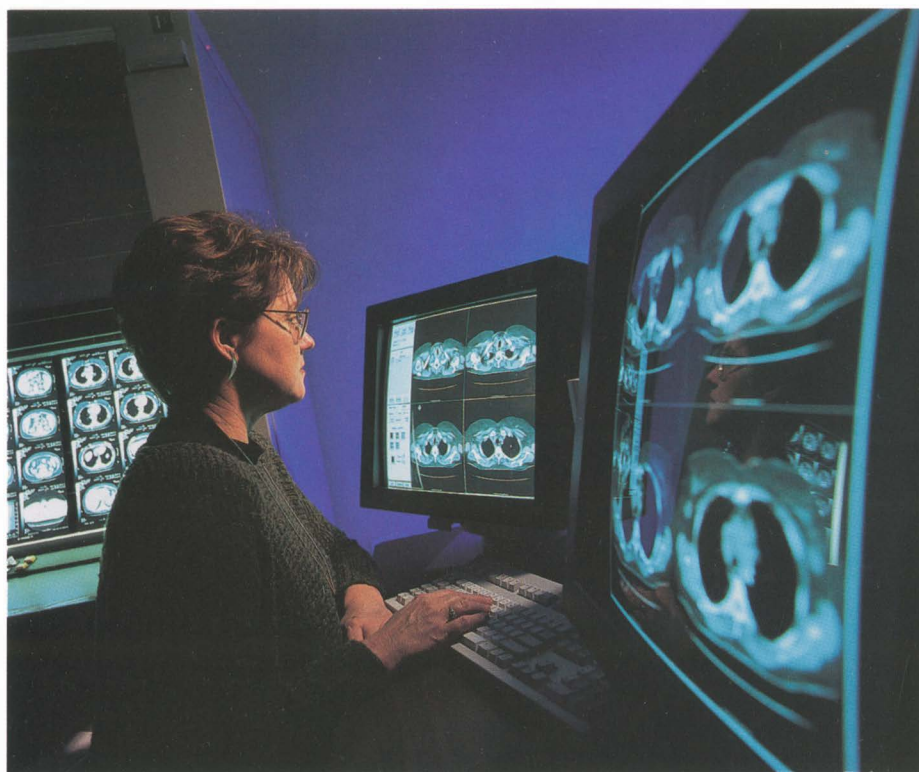
Seymour went on to complete his M.D. degree but decided to forego a residency to focus on building Gold Standard Multimedia, the high-tech medical education and information company he founded with James Lowy, Esquire, in 1992, while still a student.

The Radiologic Anatomy course became GSM's first product and is currently in use in medical schools, radiology residency programs and radiology technology programs. Additional medical education software courses, authored by other physicians and educators, soon followed.

After her initial foray into multimedia publishing, Lanier went back to being a "regular professor" at the medical school. But she kept an eye on her former student, Seymour, whom she calls a true visionary. "He understood that electronic medical education was coming before many people really knew where the technology was headed."

Educator role expands

Lanier continued to practice under the auspices of the University of Florida and Shands Hospital, also in Gainesville, as an academic physician, instructing students and residents in diagnostic radiology. She served in the dean's office



As executive producer of Gold Standard Multimedia's Integrated Medical Curriculum Web site (www.imc.gsm.com), Linda Lanier says, "It's exciting to think about how far the company has taken technology and how much opportunity there is to expand it."

as chair of both the admissions and academic status committees and worked for three years as director of Shands' Park Avenue Imaging Center. Along the way she garnered numerous awards, including "Teacher of the Year" honors in the College of Medicine four years in a row.

Active in the Association of University Radiologists and the Radiological Society of North America, she is a frequent lecturer at national and state medical conferences on a variety of topics, including computer-assisted learning programs and breast cancer. She has been an instructor at the University of Florida's annual mammography review courses for the past four years.

"I've always enjoyed combining patient care with teaching and developing teaching materials," says Lanier. "But I've seen the shift in health care as academic centers have moved toward more of a business model. When my administrative work began to take precedence, I felt that I was missing some of my teaching opportunity. There was a time squeeze between clinical pressures and teaching — and for me, teaching was losing out."

The opportunity to apply her teaching expertise and flair for developing educational media for the medical field drew Lanier back into business with Gold Standard Multimedia. Now she sees patients only one day a week and spends the balance of her time on GSM projects.

"The beauty of this arrangement is that it has freed me to devote time to a variety of educational projects, plus I get to spend more time with students," says Lanier.

Gold Standard Multimedia launched its Integrated Medical Curriculum (IMC) last August, with Lanier as its executive producer. She says, "It's the first program ever to link together the study of anatomy, physiology, histology, immunology, medical ethics and pharmacology on a single Internet site. The site provides health-care students and professionals, as well as consumers, free access to a wealth of medical resource materials."

Seymour says Lanier's stature as a pioneer in the field of multimedia courseware, combined with her devotion to excellence in medical education and experience with medical school administration, made her the ideal candidate for the executive producer role.

Lanier says her job is "to work with other authors and to help them publish electronically. Most of them are still very unfamiliar with the terrain of electronic publishing. I provide an avenue of communication between the medical authors and our technology experts. Because I am familiar with both worlds, I can understand what the medical faculty are trying to get across and can translate to the programmers. We're all on a learning curve, a steep learning curve, toward understanding Web-based publication."

Focus on academic excellence

Lanier says that "a lot of people are putting stuff on the Web, but Gold Standard Multimedia is committed to publishing only credible materials. So my role is to work with authors of substance — academicians seeking to publish their work electronically. That requires assessing the materials, reviewing authors' credentials, and getting peer reviews before they can publish."

Lanier adds that although many "e-health sites" can be found on the World Wide Web, the layperson doesn't always know whether a site is providing accurate information or not. "My mission is to produce and publish academically sound health-related materials for medical students, allied health students, physicians and allied health professionals, and laypeople. Our published materials are much like textbooks or journal articles, but with the added value of animation, sound and video clips."

In addition to its free on-line content, which is supported with advertiser revenue, the company markets its products on CD-ROM in medical bookstores and to institutions through site licenses. GSM medical education products are now used in more than 95 percent of American medical and osteopathic schools, Lanier says.

But the real power of GSM's multimedia educational materials is that a user has access to all of the company's medical programs. "For example, someone studying the dissection of the heart in the Human Anatomy program can, with the touch of a button, easily jump to a CT scan image of a normal heart in the Radiologic Anatomy program, then take a look at what a normal heart muscle looks like under a microscope in the Microscopic Anatomy program," she says. "They can continue their study by checking animations of heart function in the Essentials of Physiology program, check out medications used to treat heart disease in the Clinical Pharmacology program, or participate in an interactive discussion

“If the data changes today, we can change it on-line today. And it’s much easier to update the ‘harder’ CD versions periodically than it is to reprint thousands of hardbound books.”

on the issues surrounding patients with terminal heart disease.”

Lanier says a program is currently being developed to demonstrate basic clinical skills. “We’ll show a student how to look into a patient’s ear, instead of just using photos and text,” she says. “We can demonstrate how to hold an otoscope and what to look for.

“Soon, we hope that we will be able to develop a way for students and physicians to also hear heart sounds, to take a virtual journey through the chambers of the heart as though they were a red blood cell or practice taking care of a simulated heart patient in the ICU.”

As for the multimedia aspect of the program, Lanier says that it “allows the use of audio, video and animation, providing a more robust experience for the student. As producer, I’m involved in planning that experience, as a bridge between the authors and the programmers.”

And she sees another benefit of on-line educational technology versus printed textbooks. “If the data changes today, we can change it on-line today. And it’s much easier to update the ‘harder’ CD versions periodically than it is to reprint thousands of hardbound books.”

So, is there a downside to all this technology?

“There is conversation in the educational world about the growing impersonalization technology can create,” Lanier says. “But in my experience as an educator, having materials in multimedia format enhances the learning experience.

“There’s no question that ‘hands-on’ practice is still necessary. There’s no substitute for listening to how a heart sounds, for having an actual physical presence with patients. But what electronic learning materials do is optimize the time students spend with faculty and patients. We’re still learning what technology can offer, and we’ll continue on

that learning curve. But the technology is already here, and we need to embrace rather than resist it.”

Scanning the future

What’s ahead for Lanier and her relationship with the leading edge medical publishing firm?

“The company believes that the future of education will revolve around electronic publications,” she says. “Students not only know how to use the technology; many universities require them to have computers. And the students of today are the physicians of tomorrow. When I made the decision to work with GSM, I could already see that the future of education will be heavily centered around electronic resources.”

Lanier says that her work with GSM has generated “phenomenal” response. “Students love it. They tell us, ‘You saved me on the last exam,’ and they suggest other product features to us. Medical faculty and physicians are using it, and eventually we will have materials available for all allied health fields, undergraduates, the med student level and up through continuing education.”

As she teams up with the pilots of GSM’s cyberpublishing endeavors, Lanier sees technology advances ahead that promise substantial new markets.

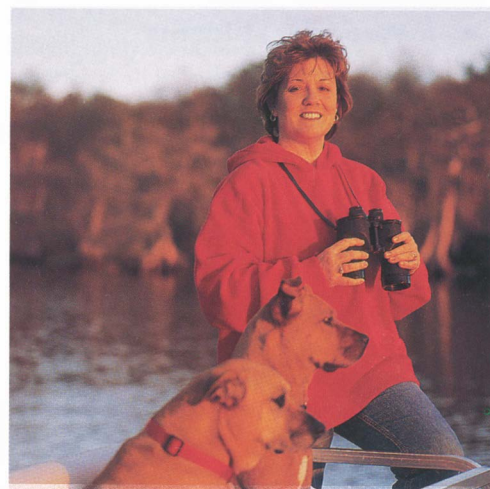
“We’ve discovered a huge amount of interest in our medical reference materials from the general public,” she says. “We know that consumers in general are interested in e-health sites, and we’ve found that we don’t have to tailor the material to present it in lay terms. People want the level of detail we provide.

“One of the trends that goes along with consumer use is the increased availability of high-speed Internet access for home users. Right now, most users find it easier to use the Web site from locations with high-speed connections, and if they want to use the programs at home they

use our CD-ROMs. That will change in the not-too-distant future, because of the growing demand for residential high-speed access.

“And when those home users sign on, the Integrated Medical Curriculum will be there for them.”

This story is reprinted with permission from the March/April issue of Women in Medicine magazine.



Lanier, who majored in religion at Furman, worked in public relations and television before enrolling in medical school in the early eighties. To unwind from her busy schedule, she enjoys outings on Florida’s Lake Norris with friends Bonz and Bogart.