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NEWS

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Software Boosts Doctors' Ability to Diagnose Skin Diseases

Doctors' ability to diagnose skin problems ranging from common allergic reactions to rare and potentially deadly diseases like anthrax more than doubled when they had access to a new software system developed largely by physicians at the University of Rochester Medical Center.

Officials with Logical Images Inc., the Rochester-based company that has grown out of the effort begun by two dermatologists at the University, are presenting the technology today at the Empire State 2002 Biotech Conference in Albany. Nancy Weyl, M.D., president of the company, is one of several people who will discuss biotechnology and bioterrorism preparedness at the conference, which is sponsored by the Academic Medicine Development Company.

The technology presented by Weyl has its genesis in work by Arthur Papier, M.D., assistant professor of dermatology at the University. For more than 10 years Papier has been interested in the use of new technologies to boost doctors' abilities to quickly and accurately diagnose patients' illnesses.

"Every dermatologist sees plenty of cases where the diagnosis was missed by an earlier visit to a physician, even though a visual clue is present. Most doctors just don't see enough cases to be able to diagnose skin diseases immediately and accurately, so they use the best resources available."

"Typically, doctors flip through books trying to find pictures that match what they see with a patient. But most books usually have only one or two images for each diagnosis, and that's not enough to account for the great variation that is characteristic of every biological process."

Most important, says Papier, is that books and other resources are usually organized by disease. "You need to know what disease it is before you can find the pictures," he says. "This isn't helpful to someone who is trying to diagnose the disease."

So Papier and dermatologist Lowell Goldsmith, M.D, dean emeritus of the University's School of Medicine & Dentistry, created a software system that makes thousands of images available. Instead of needing the name of the disease at the outset, doctors and other health-care professionals can browse the image bank, narrowing searches by describing what they're actually seeing, such as "black scabs" or "red scaly patches on scalp."

The system more than doubles the rate of accurate diagnosis by emergency room physicians, family and primary-care doctors, according to results presented by Papier at meetings of the American Medical Informatics Association. In the study, 50 physicians were confronted with four hypothetical cases of skin disease. When doctors had access to the Logical Images software and had been trained on it for only five minutes, they were twice as likely to make the correct diagnosis as when they relied on books and other conventional resources.

"We start with what the doctor is actually seeing. Then we work toward a diagnosis," says Papier, who is Chief Scientific Officer of Logical Images. "If you're not a dermatologist, you don't know the vocabulary. Here, all you need to do is look at your patient. But underneath, there's a rich database of knowledge. It's much more than just a collection of pictures."

The software guides a physician through a series of questions accompanied by screens full of photos. The system asks for potentially relevant information about a patient's medications, recent travel, family history, allergies to pets and foods, and other topics. Doctors can also specify whether scabs are fluid filled, where on the body a rash appears, what color it is, how long it's been present, and a host of other details.

Accompanying the questions are more than 16,000 images in the system. The scientists are continually adding to the database: Papier is working with the Department of Dermatology at New York University, which has compiled more than 1 million images of various skin diseases, including one of the world's best collections of images related to HIV.

In addition to a guide to general rashes in adults, the company's databases have detailed sections on skin conditions in African-Americans, and a guide developed by University of Rochester physicians to genital rashes among female patients.

Thanks to a suggestion two years ago by D.A. Henderson, the Rochester alumnus who led the worldwide campaign to wipe out smallpox, Papier incorporated images of diseases like smallpox and anthrax when developing the software. That has helped fuel current interest among users, he says.

"There's been a great deal of interest among public health officials as they start thinking about how to arm front-line providers with better information resources," Papier says. "The anthrax attacks underscored the need for public health officials to think about how best to help people diagnose these things early, to have the best possible tools to shorten the time of diagnosis from days to hours or minutes. Even though most people have never encountered a case of anthrax, smallpox, or plague, it's vital that the first health professional to encounter such a patient be able to do so."

Several customers around the nation are using the technology, including dozens of physicians in private practice as well as emergency rooms, hospital systems and residency training programs. Part of the software is available on Medscape's web site, where it has attracted thousands of users.

In addition, Papier is testing the technology at the University's Center for Future Health, where physicians and scientists are working together to develop technologies that make up a "smart" home to help patients stay healthy. A computer to help a resident monitor skin conditions joins a gait monitor, melanoma detector, and a computerized medical adviser currently under development at the center.

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