Name that splotch!

Online visual decision support tool is a valuable resource for doctors and students alike.

BY SAUL CHERNOS

Discolouration of a patient's epidermis could be more than skin deep. It might be relatively harmless vitiligo, it might indicate a serious drug interaction, it might even be a potentially life-threatening skin cancer. Yet, general practitioners and even specialists can find themselves face-to-face with conditions they haven't seen before or symptoms that don't add up.

Traditionally, doctors have thumbed through well-worn medical reference books to identify possible suspects. Now Logical Images, a Rochester, N.Y.-based healthcare informatics company, has developed an online visual decision support tool that presents medical images and data in the context of a sophisticated database.

VisualDx contains roughly 16,000 images covering more than 900 visually identifiable skin, oral and eye-presenting conditions and those which show through chest radiography. Physicians can enter a patient's symptoms and other clinical findings such as lesion type or body location, and then input non-visual factors such as medical history, medications a patient might be taking and places they've recently visited. Every piece of data entered sharpens the focus of potential conditions, leaving the most likely images and supporting text on the physician's computer screen for side-by-side comparison with the patient. VisualDx presents multiple images of each disease, shows how they might look at different stages and in people of different ages and races, and recommends possible diagnostic tests and courses of action.

VisualDx sources images through a global network of physician-photographers and institutions, including medical schools at NYU and UCLA. An in-house editorial team and an advisory board with more than 80 physicians help create and vet content. "We have a peer-review process, and every searchable relationship in our database must be referenced to the literature or, if it's a dermatologic finding, to the expertise of a physician," says Logical Images co-founder and chief scientific officer Dr. Art Papier.

The database includes modules such as Drug Eruptions, which covers some immediate hospitalization might be required," says Papier, a dermatologist who teaches at the University of Rochester.

A physician with a patient who has an ulcer and a fever and has recently returned from a vacation can type in any country in the world and every U.S. state to look for potential geographic connections. The database is also searchable by symptom and by age — potentially useful with newborns or the elderly. VisualDx even includes diseases that have been eradicated but are considered potential bioterrorism threats. "From a public health perspective, instead of trying to get busy doctors to memorize what smallpox looks like — no one believes it will happen — you can put a tool like this in emergency rooms and doctors' offices and then they have the information. It might even help prevent false alarms, where doctors have actually believed patients had smallpox and quarantined the hospital until they sorted it out."

This collection of digital images and text is intended as a diagnostic aide and not to replace specialists, Papier says. "It's to make the referral of patients to specialists more appropriate. Medical students typically receive little dermatology training. Yet, if they end up in primary care, internal medicine, pediatrics or family medicine, many of their visits are patients asking about something that's on their skin, tongue, eyelid or genitals, where there are visual clues."

Papier says patients often visit doctors for internal complaints such as chest pains or hypertension and then inquire
VisualDx gets road test

Our board members use the system in the “real world”.

With software, nothing beats kicking the tires. Three physicians, all members of the Technology for Doctors advisory board, tried VisualDx for a few weeks to look at content, accuracy, performance and related issues.

David Zitner, a Halifax family doctor, says he’s impressed by the software’s ability to categorize conditions by factors such as lesion type and distribution. “It is a very useful piece of work, not only to answer dermatology questions, but also to inform students and clinicians about the complexity of medicine — namely that one condition can present in multiple ways and that one presentation can be associated with several clinical conditions.”

While Zitner found VisualDx user friendly — he says a one-hour demonstration is probably enough to get people started — he found the range of medical terms users can enter to be a bit awkward. For example, the term ‘chicken pox’ does not come up, though it does work with ‘chickenpox’ and ‘varicella’.

Zitner, who is director of medical informatics at Dalhousie University, sees potential in VisualDx as an educational tool because it helps users learn how to solve problems quickly and systematically. He demonstrated the system as part of his Critical Care for Non-Clinicians course, where many students don’t have formal medical training, and many of them remarked that VisualDx showed that a wide variety of conditions can cause similar kinds of visible symptoms. “It was interesting for them to realize how complicated the diagnostic process is.”

Michelle Greiver, a Toronto family doctor, says VisualDx is a good idea and she would like to see more software-based diagnostic aides. However, she also had issues with language. “I wanted to look up ‘venous ulcer’, but I couldn’t get that to load. It listed ‘stasis dermatitis’, but it’s missing a couple of accepted terms that are common in my office.”

While physicians can show images to patients in order to explain and convince them about diagnoses, Greiver says she found VisualDx somewhat slow, taking more time than she would have liked to enter all the symptoms and sort through the images.

“It’s basically another add-on,” says Greiver, who has used an electronic medical record for about a year. She believes a product such as VisualDx needs to be distributed through a provincial body such as OntarioMD and integrated into EMR systems.

“Once you use an EMR, it’s what you use all the time. VisualDx needs to be put right inside my EMR so that it becomes a part of it. Otherwise I have to think about it all the time and I’m less likely to use it.”

Dr. Alan Brookstone, an e-Health consultant with the Vancouver Coastal Health Region, says he found VisualDx much easier to use than a paper-based atlas of dermatology or internet search engines. “It’s something physicians might use during an actual clinical encounter if they’re looking for something specific to demonstrate to a patient, but physicians would more likely use it when they go back to their computer to research a specific topic.”

Brookstone tested VisualDx for several conditions, including a fairly benign one popularly known as geographic tongue, which presents as pink and white map-like markings.

“Having looked through various atlases, and at various web resources, I found VisualDx very comprehensive. The quality of the images is generally good. It’s easy to sort through the images and then zoom in and view an image in a larger format.”

However, Brookstone agrees that VisualDx, like other standalone digital tools, needs to be integrated into EMRs. “The average GP has about 10 minutes to spend with each patient, so I thought it was a little bit rough. But, overall, it has merit, integrated or not.”
about a rash or growth. “It can be a challenge for a clinician to decide if they can diagnose it themselves or refer the patient to a specialist, but there are too few specialists, particularly dermatologists, and they’re very busy. It behooves the system to push down to the generalists improved capabilities in the area of these specialties. We’ve designed VisualDx with this in mind.”

The roots of VisualDx harken back to 1993, when desktop computers were becoming more common and when the Internet as we know it today was just around the corner. Rochester, home of Kodak, was turning into a hotbed of imaging and related software expertise. It was in this milieu that Papier teamed up with Dr. Lowell Goldsmith, a dermatology professor at the University of North Carolina, and held a demonstration project with Kodak.

“Our focus was always to bring image recognition into one unified system,” Papier says. “Instead of having separate boxes for dermatology, infectious disease, ophthalmology or radiology, we envisioned one unified system that would eventually be interoperable with a computerized medical record.”

While patient-based electronic medical and health records remain haphazard efforts, Logical Images has a few integration projects with EMR companies in the U.S. and has marketed VisualDx primarily to public health departments and hospitals – Papier estimates 500 are on board so far. “We’re very interested in relationships with membership societies to bring the technology to their members,” Papier says. “This can include internists, paediatricians, family physicians and others.” Individual physicians can subscribe over the Internet using a credit card.

Papier says he doesn’t know of any Canadian users, aside from dentists who subscribe to VisualDx Oral and Mucosal Lesions, a standalone module of VisualDx. “We’ve been a very small development company (Logical Images has 30 full-time employees) and haven’t had the manpower to market it worldwide,” Logical Images also sees educational and training value for medical schools – Harvard Medical School, the University of Rochester, the University of Iowa, and several others already include VisualDx as a curriculum support. In early 2007, the company launched a consumer portal, VisualDx Health. “People are going to the internet before and after their doctor visits, and we thought we could produce a site that was compelling, high quality, serious and fulfilled a need.”

VisualDx runs in a PC environment with most Java-enabled web browsers – doctors and nurses can test this online before purchasing. “Basically you need to know how to use your mouse,” Papier says, adding that online demonstrations are available to qualified medical professionals. “It’s very intuitive. Most doctors can figure it out with a little experimentation on their own.”

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