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Raymond D. Aller, MD, and Hal Weiner

How one pathologist made use of artificial intelligence

Like many pathologists, Jay J. Ye, MD, PhD, longed to spend less time preparing reports and more time interpreting slides and rendering diagnoses. Rather than dedicating half of his workday to what he considers secretarial tasks, the dermatopathologist wanted to devote the lion's share of his hours in the lab toward applying the knowledge and skills he developed during his years of medical training and practice.

Inspired by IBM's Watson, the computer system that defeated greatest-ever "Jeopardy!" champions Ken Jennings and Brad Rutter in early 2011, Dr. Ye came up with a solution: Apply artificial intelligence to the voice-recognition, word-processing, and pathology information systems used by his group practice, Dahl-Chase Pathology Associates, in Bangor, Me.

"It was ridiculous that I was spending so much time doing things that don't require medical school, residency, and fellowship training," Dr. Ye says. "A significant portion of report preparation is secretarial in nature—about formatting, regurgitating, and proofreading. So I said to myself, 'I should be able to program it.'"

A skilled amateur computer programmer, Dr. Ye started developing his secretary-mimicking artificial intelligence, called SMILE, about two years ago. It now consists of more than 20,000 lines of code. When interfaced with Dahl-Chase's Sunquest PowerPath, Microsoft Word, and Dragon Medical Practice voice-recognition and transcription systems, SMILE reduced report-preparation time by 80 percent while dramatically decreasing the incidence of typographical and transcription mistakes.

"SMILE is attentive to details, frequently catching errors in reports, such as section codes and specimen dimensions in the gross description," Dr. Ye says. The software also commonly detects and corrects slide-labeling mistakes.

"Since incorporating a gender error-detection module a year ago, the software also catches such gender errors as 'Mary' misidentified as male or a vasectomy specimen with the patient gender assigned as female," Dr. Ye says. SMILE has caught approximately 50 gender misidentification errors, he adds.

Eager to share the concept with other pathologists, Dr. Ye wrote an article about SMILE, published in last month's issue of Archives of Pathology and Laboratory Medicine, and gave a presentation on his invention during the

annual meeting of the United States and Canadian Academy of Pathology last spring.

Encouraged by his colleagues, he applied for a patent for SMILE earlier this year but doesn't know whether he'll market the artificial intelligence program commercially. "The important thing at this point is to get the information out," Dr. Ye says. "I want pathologists to understand the power, as well as the availability, of artificial intelligence. My ultimate goal is that I want to see a paradigm shift in my profession regarding how to prepare the report—shifting from the prevailing focus on how to do voice recognition better to how to use the help from artificial intelligence."

At Dahl-Chase, physician assistants are responsible for the initial processing of tissue specimens—inputting patient demographic and other identifying data into the information system, preparing slides, affixing barcodes, and using dictation software to write a gross description and a preliminary report. When Dr. Ye or another pathologist scans the first slide of a case, SMILE's synthetic voice states the patient's name and the specimen number and label, such as "left back of thigh." SMILE then reads the gross description of the specimen and the preliminary report in a second or two, announcing the number of corresponding slides and warning of any typographical or voice-recognition errors. The software corrects spelling errors in the specimen list and common transcription mistakes—changing "allergic content dermatitis" to "allergic contact dermatitis," for example.

When Dr. Ye utters the command "diagnosis," SMILE opens the appropriate window for the case in PowerPath—that is, a Microsoft Word window for text entry. The program automatically types a standard header for each specimen and moves the cursor to the correct location in the report as Dr. Ye dictates successive diagnoses.

To maximize efficiency, Dr. Ye built composite commands into the program that let SMILE interpret and expand abbreviations. For instance, the command "IDN congenital" prompts SMILE to type "intradermal melanocytic nevus with congenital features." If the case has just one specimen, he can simply say, "Release case IDN congenital," to finalize a single skin biopsy.

SMILE requires just 11 seconds to complete a report when no errors are detected, Dr. Ye says. During this time, the pathologist can begin reviewing slides for the next case.

SMILE saves the most time when cases are complex. "When I dictate the diagnoses in multi-specimen cases, SMILE knows which specimen the diagnosis belongs to without the need for me to state it explicitly," Dr. Ye explains.

SMILE is also more efficient and accurate than a human secretary, he contends. "SMILE types 1,000 words per minute, has an eidetic memory, and is an exceedingly fast reader."

Another benefit is that the program can be customized by users to meet their needs. "SMILE is teachable," Dr. Ye says. "My colleagues have trained SMILE to do things the way they want, and I trained SMILE to do things the way I want."

"If you can order something from Amazon.com," Dr. Ye says, "you can teach SMILE. It's that easy."

For more information about SMILE, email Dr. Ye at jye@dahlchase.com.—*Carolyn Schierhorn*

Abbott purchases Omnilab

Abbott recently acquired Omnilab, a provider of middleware for clinical diagnostics and blood transfusion laboratories.

"With this acquisition, Abbott now has the ability to offer a seamless, all-in-one solution for customers," says Jaime Contreras, senior vice president of core laboratory diagnostics, commercial operations, at Abbott.

Abbott plans to expand availability of Omnilab LabOnline middleware solutions to markets outside the United

States.
[**Abbott Diagnostics**](#), *224-667-6100*

As ICD-10 deadline looms, CMS revises and teaches

As the Oct. 1 deadline for switching from ICD-9 to ICD-10 coding for medical diagnoses and inpatient hospital procedures fast approaches, the CMS is relaxing some requirements and stepping up health care provider education to smooth the transition.

The Centers for Medicare and Medicaid Services has released a guidance document that cuts providers slack with regard to payments and penalties during a transition period and sets up a communication center, staffed with an ICD-10 ombudsman, to address physician concerns.

Among the guidance set forth in the document is that for 12 months after ICD-10 implementation, CMS will not deny physician or other practitioner Medicare claims based solely on the specificity of the ICD-10 diagnosis code as long as the physician or practitioner used a valid code from the correct family. Furthermore, CMS will not audit Medicare claims based on the specificity of the diagnosis codes as long as they are from the appropriate family of codes.

In a manner similar to its plan for claims denials, CMS will not penalize physicians for the Physician Quality Reporting System, value-based payment modifier, or meaningful use based on the specificity of the diagnosis codes as long as they are from the appropriate family of codes.

The guidance also states that the federal government may make advance payments, which are conditional partial payments that require repayment, when Part B Medicare contractors cannot process claims in established timeframes due to administrative problems.
In the meantime, CMS is working to educate providers about ICD-10 requirements via such means as its website, "Road to 10: The Small Physician Practice's Route to ICD-10." The site is intended to help smaller physician practices build action plans by providing them with fact sheets, videos, quizzes, interactive case studies, and other educational materials.

The agency's "ICD-10 Quick Start Guide," released earlier this summer, focuses on five steps: make a plan, train your staff, update your processes, talk to your vendors and health plans, and test your systems and processes. The CMS details tasks relevant to each step and offers links to additional information.

The agency will host an MLN Connects national provider call, titled "Countdown to ICD-10," on Aug. 27. The free educational conference call will focus on coding guidance, updates, and provider resources. It will also offer tips from representatives of the American Health Information Management Association and American Hospital Association.

New app provides patients with laboratory test results

Halosys Technologies has developed Health Meter, an integrated mobile platform that can interface with any laboratory information management system to allow diagnostic labs to give patients access to their lab test results via a mobile app.

A content-management portal allows laboratories to select the features or menu items it wants to make available in the app; add custom pages or menu items; create detailed reports and analytics; generate an audit trail; manage users; and brand the app with the user institution's colors, logos, or other identifiers.

Halosys will work with a lab to custom configure a health meter display algorithm for each of the lab's testing services. Health Meter places patient test results in red, yellow, or green zones to indicate a result's proximity to the desired result range.

Besides posting patient health alerts, the app allows patients to locate testing locations, with maps; book appointments; learn about a laboratory's service offerings; make payments; access educational materials; and view frequently asked questions.
[Halosys Technologies](#), 800-531-4256

Proscia offering telepathology software with global focus

Proscia, a cloud-based solutions provider for digital pathology, has released Proscia Connect, telepathology software to foster collaboration among pathology experts worldwide in the fight against cancer.

The software, which runs on Amazon Web Services, creates a real-time hub for pathology consultations, second opinions, and diagnosis validation. It provides live, multi-user screen sharing for slide review; centrally accessible slide annotations and case data; and international voice and text chat.

Thermo Fisher and CDC partner on microbial pathogen ID

Thermo Fisher Scientific and the Centers for Disease Control and Prevention have codeveloped software that allows public health laboratories worldwide to access the CDC's MicrobeNet virtual reference lab database.

Thermo Fisher's MicrobeBridge software platform connects Sanger sequencing results to the MicrobeNet online database. This allows researchers to more quickly identify microbial pathogens that may underlie global outbreaks, Thermo Fisher reports.

MicrobeBridge integrates with all Applied Biosystems capillary electrophoresis instruments. It automates the assembly and quality control of raw Sanger sequencing data so the data can be presented in a searchable format in the MicrobeNet database.

"Expanding MicrobeNet will allow public health laboratories anywhere in the world to run sequence-based, phenotypic, or, eventually, other tests and match results against a highly curated database comprised of our unique collection of pathogens," says John McQuiston, PhD, team lead for the CDC's Special Bacteriology Reference Laboratory.
[Thermo Fisher Scientific](#), 800-678-5599

Domain comparison and synchronization solution available to Cerner clients

Summit Healthcare has partnered with S&P Consultants to offer a domain comparison and synchronization solution to all Cerner Classic and Millennium clients.

The solution, Summit InSync, features a data-extraction, analysis, and update platform that can manage production and nonproduction domains across a hospital enterprise.
[Summit Healthcare](#), 866-925-9375

GenoLogics releases LIMS as part of Illumina product

GenoLogics recently introduced Clarity LIMS X as a component of the Illumina SeqLab solution for large-scale, whole-genome sequencing with Illumina's HiSeq X instruments.

This latest edition of the Clarity laboratory information management system provides positive sample tracking and is intended to maximize quality and throughput and improve turnaround time in population-scale genomics workflows. It includes two automated, preconfigured workflows with built-in business logic to manage the

progression of samples through the pipeline with minimal operator interaction. The X edition also provides e-signature, audit trails, and patient data security, making it suitable for regulated environments.

The product was developed based on best practices from Genomics England, a company owned by the United Kingdom Department of Health, and Illumina FastTrack Sequencing Services. It is being used in both laboratories.
[GenoLogics](#), *866-457-5467*

Cerner contracts with DoD

Cerner has announced that it will install its CoPathPlus anatomic pathology information system throughout all Department of Defense military treatment facility anatomic pathology labs worldwide.
[Cerner](#), *816-221-1024*

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