In Practice

Electronic Medical Records: How Neurologists Go Paperless

By Orly Avitzur, MD, MBA

Electronic medical records (EMR), for those of us who have adopted them, have made practice so much more rewarding and efficient that it is hard to contemplate returning to paper charting. Like other modern tools that have become indispensable – the cell phone, fax machine, or e-mail – once we have started using them, we don't want to give them up.

EMR is a medical records system that captures patient data electronically. Data entry methods vary and include keyboard, mouse, pen, touch screen, and voice recognition. Although traditional models have been created as software programs for an office computer system with networking capability, more recently developed Web-based applications are being offered in the application service provider (ASP) model. These enable the user to "rent" the programs; the data is then stored remotely, the application is serviced and maintained by the vendor, and can be retrieved remotely by the physician from any site with Web access.

Most often, the neurologist enters data into the EMR, but at times, nurses enter portions of the history for review by the physician. Some Web-based applications also allow covering associates and even patients to view portions of records. Access is restricted and usernames and passwords are assigned accordingly.

Dr. Orly Avitzur is a neurologist in private practice in Tarrytown, NY.

Use for Neurologists

Neurologists seemingly make ideal candidates for the use of EMR. We take carefully detailed histories, perform thorough and consistent examinations, and have been trained to record our findings in a standard manner. EMRs facilitate these efforts by providing drop-down menus from which findings can be rapidly selected, incorporating features such as word or phrase auto-completion, "learning" our most frequently used expressions and allowing us to create templates and shortcuts that can be inserted more quickly in clicks than stated in words into a dictation device.

Systems are designed to be user-friendly and easy to master. Training is provided through manuals, tutorials, online help, and in-person service. Once created, EMR documents can bring up the previously recorded data. When the patient is seen again, medications, laboratories, prior medical history, and other patient care details are readily available and do not have to be re-entered unless changes have occurred. These features save time with repeated usage, a benefit perhaps not appreciated until the user has reached a level of initial experience with the tool. Such belated advantages are difficult to demonstrate to the neurologist considering taking the plunge, but one of many reasons users get hooked.

Experts Cite Benefits

To learn more about the experience neurologists have had with EMR, *Neurology Today* spoke with several AAN members and experts in this field. Joel S. Perlmutter, MD, Head of the Movement Disorders Section at Washington University in St. Louis, said that he more than *doubled* his patient load after converting to an EMR nearly eight years ago. Using an EMR has saved him tremendous time in both seeing patients and responding to telephone calls. He added, "We do not have to search for charts and calls for medication refills are much faster since we can quickly identify past scripts and all meds and allergies." In addition, previewing notes from housestaff before they present patients to him makes their interaction with him more efficient.

Time Study

Kenneth J. Gaines, MD, Associate Professor of Neurology at Vanderbilt, agrees. He conducted a time study and found he saved 20 percent on record generation for each patient, a sizable savings by the end of a 20-to-25 patient day. In fact, a 2001 study by The Boston Consulting Group, *Vital Signs Update: Doctors Say E-Health Delivers*, confirmed that more than 92 percent of users reported that EMRs have improved their overall efficiency and 88 percent felt they have improved the quality of care delivered to patients.

How can neurological care also be improved? EMRs may link to clinical decision-support tools including practice guidelines, medication and drug-interaction databases, medical literature, and other resources that help us practice more safely. Many systems offer automated alerts and warnings that can notify neurologists of toxic or abnormal laboratory levels, remind us of drug allergies, or prompt us when a patient is overdue for a specific treatment or test.

> 'The one-size-fits-all approach to current records is simply not realistic.'

Drug Alerts

Dr. Gaines has linked his EMR in to a drug interaction database that automatically produces a written alert when there is a problem. He said that many of his patients are elderly stroke patients on multiple medications for other health issues, many of which he is not

MS

Continued from page 29

apy and 16 completed 12 months of combination therapy. MRI was done at each monthly visit up through month six, and again at months nine and 12. Disability progression was assessed at the screening visit and repeated on months three, six, nine, and 12.

The researchers found that eight of the 11 patients with any enhancing lesions at the start of the trial had a decrease in number and volume of lesions at six months. Only two of the 16 patients who completed the trial had any new lesions during months six to 12, and they were reduced in number and volume compared with the previous six months. One of the measures of disability, the timed walk, improved significantly over the 12 months of the trial. No relapses were seen during the final six months of the trial. Dr. Lublin had no disability data for those who dropped out of the trial.

Dr. Lublin and his colleagues conclude that combination therapy poses no risk of new enhancing MRI lesions. In fact, they believe the decline in number and volume of enhancing lesions – from baseline to six months and six to 12 months – suggests that effectiveness increases with time. These investigators contend that the results support a larger, pivotal trial of combination therapy.

The safety trial is continuing, although it is no longer receiving financial support from Biogen, Inc. and TevaNeuroscience, who had supported the 12-month study. In addition, there is anecdotal usage of combination therapy around the country. Dr. Lublin added, "Right now we have a clinical-trial planning grant from NIH, to plan a large phase III multicenter trial to evaluate the efficacy of the combination. We will be applying for the full clinical grant this spring. The data from the safety trial contained some hints of greater efficacy, but nothing that we would sell."

Dr. Benjamin Brooks

Outside Commentary

Commenting on the study by phone, Benjamin R. Brooks, MD, Professor of Neurology at the University of Wisconsin Hospital and Clinics, noted that only approximately half of the patients who entered the trial completed the full 12 months. He pointed out, however, that the trial was originally scheduled to last six months and was extended to 12 months to obtain further safety information.

Dr. Brooks was pleased that there was no apparent safety issue with respect to enhancing MRI lesions when both therapies were combined. "I think the improvement in timed walk seen over the 12 months suggests that combination therapy is worth investigating in a larger efficacy trial." ★

familiar with. The alert allows him to select a replacement if he feels the interaction is unacceptable.

EMRs also allow us to practice more safely while away from the office or cross-covering our colleagues. Dr. Perlmutter cited a recent example of being called at night by the husband of a patient with Parkinson disease (PD) who had begun hallucinating. Although he was covering for a doctor who was out of town and he did not know the patient, he could review her record from his home computer and access her medication history and allergies in order to make the appropriate changes.

EMR helped one neurologist double his patient load.

Remote Access

Most EMR users love this remote access capability. James J. Anthony, MD, a neurologist in a group practice who is also an AAN Medical Economics and Management Subcommittee member, said that as long as he has access to a computer and a phone line, he can view his records. He said, "Emergency room doctors love it! If one of my patients arrives in an ER, I can read relevant areas of the chart to the emergency room doctor."

Dr. Anthony also likes to access his charts remotely. He has been traveling frequently in his capacity as the AAN member to the Practice Expense Advisory Committee and advisor to the Relative Value Scale Update Committee. In order to comfortably cover his own patients for routine matters while he is out of town, he simply dials into the office EMR system, checks his internal email, reviews the charts, and sends back his response.

Dr. Gaines also likes being able to review the nuances of a case when a referring doctor calls. "Being able to access my office notes in a few seconds prevents my relying on a limited memory bank for multiple patients," he said. Some practices have actually negotiated reductions in their malpractice insurance premiums based on these error-reducing features. Just producing legible, clear, unalterable records is an advantage, from the medico-legal point of view.

Data Retrieval

EMRs organize data in a variety of ways that allow us to retrieve it selectively. Reporting features allow us to search for groups of patients by disease, medication, demographics, service levels – virtually any parameter we can think of. The ability, for example, to check for all patients on a specific drug is made simple.

Nearly four years ago, when Dr. Perlmutter was notified that tolcapone was associated with fatal liver toxicity, it took him less than 30 seconds to identify the 57 patients in his practice who were on the medication. Dr. Anthony used his system to notify patients when cerivastatin was pulled from the market in August 2001. He simply brought up a list of patients and used a mail merge feature to print a letter to each of them.

For neurologists engaged in clinical research trials, the advantage of pulling up discrete data is dramatic. When Dr. Perlmutter's collaborator, Brad A. Racette, MD, decided to conduct a study on welding exposure in PD, he searched through a database of 1,600 Parkinson patients and easily found those who had admitted to welding exposure.

When the age of onset was found to be 17 years younger than the mean, he quickly identified and matched control groups. Their research was published in *Neurology* last year.

FOR MORE INFORMATION ABOUT EMR:

- The Boston Consulting Group's Report *Vital Signs Update: Doctors Say E-Health Delivers* – **www.bcg.com/publications/files/Drs_E_Health_sept_plus_report.pdf**
- Fulcrum Analytics and Deloitte Research's Report *Taking the Pulse v.2.0 Physicians and Emerging Information Technologies* – **www.cyberdialogue.com/solutions/health/pdfs/ttp_2001_execsum.pdf**
- Medical Records Institute Web site – **www.medrecinst.com**
- Electronic Medical Records: The Family Practice Management Vendor Survey – **www.aafp.org/fpm/20010100/45elec.html**
- American Medical Association Web site Resources – **www.ama-assn.org/ama/pub/category/2633.html**

Expense of Systems

So, with all these advantages, why have only a small percentage of neurologists signed on? A 2001 Fulcrum Analytics and Deloitte Research study found that 17 percent of all neurologists use EMR. The Boston Consulting Group study estimated that "22 percent of physicians are using some type of EMR system and another 20 percent were expected to adopt this capability within the next 18 months."

Why has EMR not attracted a greater following? When asked about their concerns, physicians invariably place cost at the top of the list. Of those who had *not* adopted EMR, 51 percent said: "It costs too much and the benefits aren't clear."

Just how much do these products cost? The range is quite large – from approximately $1,200 per year in the ASP model to over $100,000 for some traditional software packages depending on the features, size, and bundling of offers with other medical information systems such as scheduling and billing. But the expense should be considered in the context of overall savings.

EMRs confer economic savings to physicians by reducing or eliminating transcription costs, storage square footage, paper supplies, and costs of labor involved in chart pulls, filing, and copying. Dr. Perlmutter estimated that he reduced his office overhead expenses by 30 to 40 percent. Additionally, built-in coding advisors allow physicians to double-check their level of evaluation and management coding and avoid the losses of undercoding. As for expense, many of the newer Web-based products are offered at monthly rates, which are a fraction of most neurologists' transcription charges.

Security and Privacy

Concerns about security and privacy also ranked highly in the survey by the Boston Consulting Group. Indeed, computer errors have been responsible for several inadvertent breaches of confidentiality and the unfortunate disclosure of sensitive medical information.

This past January, University of Minnesota researchers released surveys with names of deceased organ donors to the recipients due to a software glitch. Last July, Eli Lilly sent an email message to 669 Prozac (fluoxetine hydrochloride) users with a publicly visible list of recipients. In 1996, the names of 4,000 HIV patients were copied from a state computer in Tampa, FL, and mailed to two newspapers.

But with the privacy requirements of the Health Insurance Portability and Accountability Act of 1996, many EMR enthusiasts feel paper records are actually at a disadvantage. Dr. Perlmutter contends that his EMR is "far more secure than a chart sitting on someone's desk; each user must have one password to sign on the computer and another password to sign on to the EMR program. The system is also HIPAA-compliant and has proper firewalls."

Some EMRs also have audit trails that permit tracking of individuals that enter data or access data in the EMR. These measures of electronic security prevent unauthorized viewing, a danger more difficult to control in a busy office or nursing station with paper charts.

Intrusive and Impersonal

Another fear voiced by neurologists who are hesitant to use electronic tools in the office, is that computers are intrusive and may render the encounter impersonal. Dr. Perlmutter argues that his EMR, which includes imaging capabilities such as radiographic studies, patient videotapes of movement disorders, and photographic IDs, makes the interactions *more* personal. His office staff can go out to a busy waiting room and quickly greet the correct patients by having identified them from their photograph.

Physicians who cannot type also have some reservations about using EMRs. For these doctors, EMRs that offer selections of phrases are more appealing. Others prefer products that incorporate voice recognition or integrate transcription. One thing is clear; the final product is neat and legible, eliminating the problem of poor handwriting.

Incompatibility Issues

Perhaps the biggest barrier to adoption is the lack of communication between various information sources. Ideally, an electronic chart should interact with all types of information – in- and out-patient, laboratory, pharmacy, and radiology. It even should produce longitudinal medical information. Many users also would like their handheld devices to communicate with these systems. Dr. Anthony's group has been trying to get their Palm devices to interconnect with their system for quite some time and for now, this incompatibility is disappointing.

Dr. Gaines believes that the "one-size-fits-all" approach to current records is simply not realistic; he contends that EMRs should be developed by specialty and customized for the individual. He added that there needs to be some personal interaction that helps physicians tailor the program to their unique circumstances.

A report on EMR use found that 92 percent of users improved their overall efficiency and 88 percent felt they have improved the quality of care delivered to patients.

"Once enough variations are developed, people will be able to choose an existing system that fits their needs more fully," Dr. Gaines said. Inevitably, as more hospitals make progress towards integrating their departments electronically, exposing physicians to these products and even mandating that they use them, and as their costs come down and newer computer-savvy graduates begin to take them for granted, EMR is likely to become a standard for patient care and management. ✶