



The Worst Features of EHRs and How to Fix Them

BY ORLY AVITZUR, MD

“When we learned how to write prose during our high school and university education, the burden of ensuring good communication fell upon the writer. Now we are forced to use electronic health record systems that are designed to populate databases rather than communicate the essential information to other health care providers. The end product is usually a very unimpressive list of junk that nobody believes.”

So began an email from Joseph D. Weissman, MD, a Decatur, GA, neurologist, in a week during which I received several AAN member e-mails lamenting the use of electronic health

records (EHRs). The tides are clearly shifting with more and more neurologists voluntarily adopting, or being forced to adopt, EHRs. The \$44,000k meaningful use incentive for eligible professionals is one reason, and fear of 2015 penalties — which as of now will be based on 2013 reporting of data — is another. A 2012 Texas Neurological Society survey of 127 neurologists found that although EHR adoption was high — 73.8 percent



— most were not entirely satisfied with their system and there was no clear unanimous enthusiasm for the tool.

Indeed, the transition from paper and dictation to EHR systems seems to be particularly difficult for neurologists who, stereotypically as a group, take pride in the articulation of detailed histories, assessments, and recommendations to referring physicians. These elements do not readily translate into the structured menu-driven data required in most EHRs, but this and other frustrations created by the technology have led many neurologist adopters to implement work-around solutions in response.

Neurology Today asked three neurologists from the EHR industry to respond to four of the biggest complaints about *Continued on page 27*

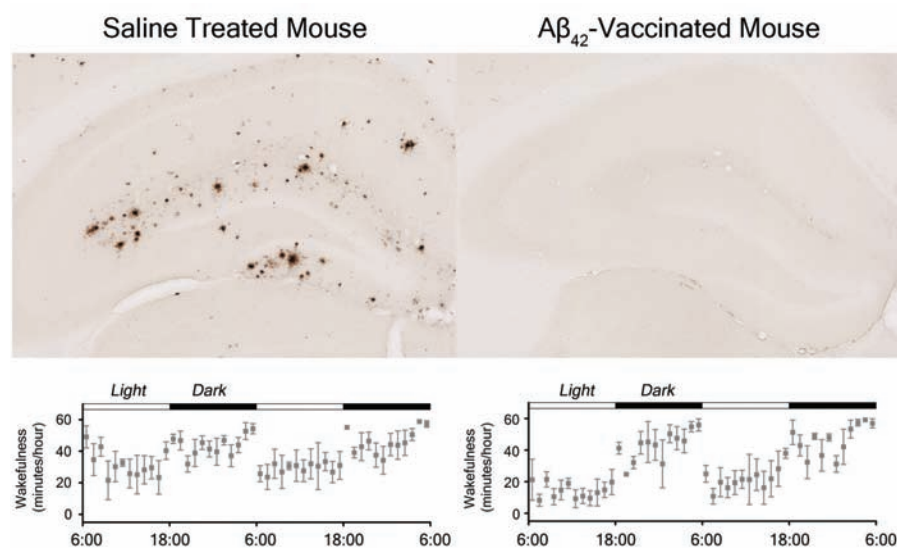
Sleep-wake Cycle, Amyloid Beta

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They looked for changes in patterns in the Abeta levels and found that the amplitude of the circadian fluctuations decreased with aging. The CSF amyloid precursor protein also showed a circadian pattern. The circadian pattern was not seen in people with dementia. The scientists are now conducting sleep studies in people with a known presenilin mutation.

There are many ideas about how this synergistic relationship between sleep cycle and amyloid beta deposition works. “There could be a positive feedback loop between the sleep-wake cycle and amyloid beta metabolism,” the authors wrote. “The early increase in wakefulness possibly initiated by the aggregation of amyloid beta may accelerate amyloid beta accumulation, which may lead to further neuronal dysregulation and increase sleep-wake abnormalities.”

Dr. Roh said that they are not sure about the mechanism of action. “Whether it happens via disruption of the cortical networks or direct or indirect impairment of sleep centers is not known,” he said. But, managing Abeta



MICE that develop amyloid beta (Abeta) deposits in the brain — hippocampus in the left upper figure — showed increased wakefulness (30 minutes per hour during the light phase — left lower panel) when they are supposed to be sleeping most of the time. In contrast, animals vaccinated with Abeta42 showed almost no pathology in the brain (hippocampus in the right upper panel) with a normal amount of wakefulness (15-20 minutes per hour during the light phase — right lower panel).

early on in the disease process could be critical in altering the disease process, he added. “The changes in amyloid beta fluctuation and sleep-wake cycle can be investigated as an early marker of amyloid beta accumulation in the brain,” said Dr. Roh. “Along with other studies that show an association between sleep and AD, having a proper amount and quality of sleep could be important to delay or prevent AD,” he said.

Washington University has a unique cohort of volunteers who are cognitively normal and have undergone serial measurements of cognitive function, CSF biomarkers, and amyloid imaging over an ongoing study period. The sleep

architecture of these volunteers is now being investigated.

Yo-El Ju, MD, an assistant professor of neurology, evaluated 100 men and women between 45 and 80 who wore an actigraph — a non-invasive, watch-shaped device that measures sleep-wake cycles, can be worn by patients at home, and is about 90 percent as accurate as polysomnography. They also completed sleep diaries and questionnaires. Half of them have a family history of AD. No one entered the study with dementia. They looked at spinal fluid and brain scans. About one-quarter of them had evidence of preclinical AD. Those volunteers who woke up more frequently,

more than five times an hour, were more likely to have abnormal readings on the biomarker studies. The findings were reported earlier this year at the American Academy of Neurology annual meeting.

EXPERTS COMMENT

The animal study strengthens the human work but experts agree that more work needs to be carried out to understand this relationship.

“We can’t draw any conclusions that amyloid is the direct cause,” said Heather Snyder, PhD, senior associate director of medical scientific relations at the Alzheimer’s Association. “The sleep-wake cycle could be disrupted for any number of reasons.”

But, she added, “if we could better understand this link it might be a good early marker for AD. There is a lot we don’t know.”

Clifford B. Saper, MD, PhD, James Jackson Putnam professor of neurology and neuroscience at Harvard Medical School and chairman of the department of neurology at Beth Israel Deaconess Medical Center, agrees. He has been studying sleep for decades and said: “It is interesting that the AD mice develop abnormal wake-sleep (actually, increased wakefulness during the normal sleep phase), which was rescued by immunization with Abeta42.” •

REFERENCE:

- Roh JH, Huang Y, Holtzman DM, et al. Disruption of the sleep-wake cycle and diurnal fluctuation of amyloid-β in mice with Alzheimer’s disease pathology. *Science Transl Med* 2012; 4(150):150ra122.

Jee Hoon Roh, MD, PhD, received an AAN Clinical Research Fellowship award from the AAN American Brain Foundation in 2011. He described his research in an interview with *Neurology Today* last year: <http://bit.ly/PK7cMS>.



In Practice

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EHRs, and provide suggestions as to how to cope with them.

“THE NOTES READ LIKE JUNK”

EHRs differ so vastly in how they manage documentation, said neurologist Michael Stearns, MD, CPC, former president and chief executive officer of e-MDs, Inc., an EHR company. “For neurologists, I’ve personally found that focusing on a basic set of templates (for example, a follow-up migraine visit) is a good way to start,” he advised. He believes that computer-assisted documentation works best when at least a significant portion of the visit note can be anticipated in advance, although he stresses that it’s important that any template-generated text be carefully reviewed to make sure it represents what actually occurred during the encounter. “As neurologists deal with extremely complex issues during visits, they need to also have the ability to document outside of templates,” he added. This is particularly true, he explained, when capturing information in the history of present illness, study results, and in the assessment and plan.

Dr. Stearns said voice recognition software is very helpful in neurology, in particular during the early stages of implementation, while the provider is refining templates. “Over time, the voice recognition software may be used less as the provider can incorporate commonly used items such as patient instructions into the preformatted text,” he concluded.



DR. ORLY AVITZUR

Templates, she explained, are note outlines comprising predefined text, lists of pre-configured choices (drop-down lists), and links that automatically pull in information directly from other sources in the EHR (such as medications, allergies, history). Examples of this, according to Dr. Weathers, include a template for a return epilepsy visit in which the user is prompted to ask about seizure frequency, drug compliance, adverse effects, etc. “Templates often have preconfigured headers and phrases such as: Mr. So-and-So is a 50-year old male who presents today... followed by a prompt to enter in text.”

Macros are short strings of characters that automatically expand into a longer phrase or block of text, she explained, noting users can develop or define their own shortcuts. For example, *.id* could become ‘Mr. Smith is a 40 year old male,’ and *.sz* could become ‘history of seizures.’

wasted mouse clicks — but rather have a set routine that drives them linearly through their workflow efficiently without recursion or doubling back.

“IT CHANGES MY WORKFLOW”

When it comes to workflow redesign, it’s better to use this opportunity to fix current flaws than to try to make the EHR reproduce your paper-practice style. Dr. Hier sees many neurologists use EHRs in maximally efficient and powerful ways. “In my experience, two things must click in the brain of the physician who is successful with EHRs: first, they must have an ‘aha!’ moment when they understand how the EHR was truly designed to work, and second, they must carefully match and modify their workflow to exploit the full power of the EHR,” he observed, adding that the best users understand the functionality of the EHR and use it to their advantage. Each EHR has a “preferred” workflow based on its design, he noted. “Efficient users learn how to use the design and inherent workflows to

the exam room is set up correctly so that eye contact is at least possible,” she said, explaining that if, for example, the computer is set up so that the physician’s back is to the patient whenever they are typing, there is no way to overcome that. Once the room issues are out of the way, Dr. Weathers tries to be very aware of her behavior. “If I am trying to review previous documentation or a note from another provider or get all my meaningful use requirements out of the way, I will actually apologize upfront and say something like ‘please bear with me for a minute and let me finish this computer nonsense and then you will have my full, undivided attention,’” she said. After completing those tasks, Dr. Weathers makes it a point to take her hands off the keys and turn her body to face her patients. “Most of the time, by simply acknowledging the issue, patients are really understanding and gracious about it,” she concluded.

Dr. Stearns adds that the iPad, or similar tablet-style computers, is less intrusive than a monitor, and helps address the problem of loss of eye contact due

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Missed some of *Neurology Today’s* updates on electronic health records for neurology — and tips for navigating and compliance with federal “meaningful use” mandates? See archived updates on *Neurology Today*: <http://bit.ly/OBE3Ad>.



“DOCUMENTATION TAKES TOO MUCH TIME”

Users who do not learn to use digital shortcuts will undoubtedly spend more time in the documentation process. “The EHR is prone to these excessively long notes, but well-designed templates that bring in pertinent information, combined with macros such as ‘there have been no significant interval changes in the patient’s past medical, surgical, social, or family history’ makes for efficient documentation and a readable note,” said Allison L. Weathers, MD, medical director of Clinical Information Services and assistant professor in the department of neurological sciences at Rush University Medical Center in Chicago.

“These may be used in even a more robust way for long patient discussions or instructions that are similar from patient to patient: *.topiramatemigraineptins* could expand into a full titration schedule for patients being started on topiramate for migraine prophylaxis with extensive discussion about the possible adverse effects. The use of these tools potentially may save a lot of time and typing effort on the part of the clinician,” she concluded.

Over time, neurologist Daniel B. Hier, MD, MBA, physician executive for US Consulting at Cerner Corporation in Kansas City, has appreciated that truly competent physician users are generally very disciplined in how they use the EHR — they don’t waste time jumping around the EHR or exert effort on

their advantage, rather than try to make an EHR fit their own workflows,” Dr. Hier said. “This is a bit non-intuitive, but to have the EHR work for the neurologist, the neurologist must understand how the EHR was intended (designed) to work.”

“IT PREVENTS EYE CONTACT WITH MY PATIENTS”

“Despite expertise with my EHR and being able to type without looking at the keyboard, this is an issue even I struggle with,” admitted Dr. Weathers, who serves as medical director in the department of Information Services at Rush. “The best advice I can give is to ensure that

to its similarity to a clipboard. It can also be easily turned toward the patient to demonstrate imaging studies, trends and educational materials, he pointed out. “The neurologists should ideally review the chart before engaging the patient, so they are not spending time fumbling through the screens trying to get oriented,” Dr. Stearns advised. “I have seen physicians do this seamlessly, and engage the patient fully while still documenting in the EHR,” he observed, adding that it’s best to generate the note after the examination, either independently, or with the patient sitting in the office after the visit. •

If you were successful in meeting meaningful use requirements and are willing to share some tips, please contact Christi Kokaisel at ckokaisel@aan.com.

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