THE JOURNAL OF
Legal Nurse
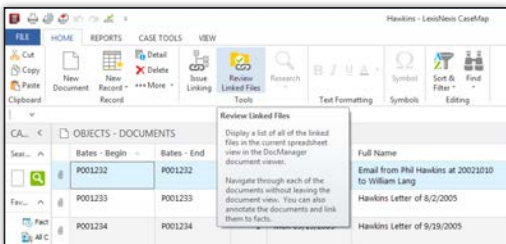# *Consulting*

ELECTRONIC MEDICAL RECORDS

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PURPOSE

The purpose of The Journal is to promote legal nurse consulting within the medicallegal community; to provide novice and experienced legal nurse consultants (LNCs) with a quality professional publication; and to teach and inform LNCs about clinical practice, current legal issues, and professional development.

MANUSCRIPT SUBMISSION

The Journal accepts original articles, case studies, letters, and research. Query letters are welcomed but not required. Material must be original and never published before. A manuscript should be submitted with the understanding that it is not being sent to any other journal simultaneously. Manuscripts should be addressed to JLNC@aalnc.org. Please see the next page for Information for Authors before submitting.

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We send all submissions blinded to peer reviewers and return their blinded suggestions to the author. The final version may have minor editing for form and authors will have final approval before publication. Acceptance is based on the quality of the material and its importance to the audience.

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The Journal of Legal Nurse Consulting (JLNC), a refereed publication, is the official journal of the American Association of Legal Nurse Consultants (AALNC). We invite interested nurses and allied professionals to submit article queries or manuscripts that educate and inform our readership about current practice methods, professional development, and the promotion of legal nurse consulting within the medical-legal community. Manuscript submissions are peer-reviewed by professional LNCs with diverse professional backgrounds. The JLNC follows the ethical guidelines of COPE, the Committee on Publication Ethics, which may be reviewed at: http://publicationethics.org/resources/code-conduct.

We particularly encourage first-time authors to submit manuscripts. The editor will provide writing and conceptual assistance as needed. Please follow this checklist for articles submitted for consideration.

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- Manuscript length: 1500 – 4000 words
- Use Word© format only (.doc or .docx)
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- Put title and page number in a header on each page (using the Header feature in Word)
- Place author name, contact information, and article title on a separate title page, so author name can be blinded for peer review
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- Legal citations: Use The Bluebook: A Uniform System of Citation (15th ed.), Cambridge, MA: The Harvard Law Review Association
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- All photos, figures, and artwork should be in JPG or PDF format (JPG preferred for photos). Line art should have a minimum resolution of 1000 dpi, halftone art (photos) a minimum of 300 dpi, and combination art (line/tone) a minimum of 500 dpi.
- Each table, figure, photo, or art should be submitted as a separate file attachment, labeled to match its reference in text, with credits if needed (e.g., Table 1, Common nursing diagnoses in SCI; Figure 3, Time to endpoints by intervention, American Cancer Society, 2003)

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Acceptance will be based on the importance of the material for the audience and the quality of the material, and cannot be guaranteed. All accepted manuscripts are subject to editing, which may involve only minor changes of grammar, punctuation, paragraphing, etc. However, some editing may involve condensing or restructuring the narrative. Authors will be notified of extensive editing. Authors will approve the final revision for submission.

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A Message from the President

Varsha Desai
BSN, RN,
CNLCP, LNCC

President, AALNC

AALNC completed another successful educational and networking annual Forum from April 16-18 in Indianapolis, IN. During our annual Forum, we reviewed the State of the Association and discussed the upcoming year of what you can expect from your Association.

AALNC's top three objectives from the strategic plan include:

1. Position AALNC as the industry leader
2. Increase the visibility of AALNC
3. Develop a sound business model

Based on AALNC's strategic plan, here are some highlights for the 2015- 2016 year:

1. AALNC Education and Networking as the industry leader

- LNC online course- Phase 2 will be rolling out later this year
- At the Forum, the Products & Services Committee developed a 2-sided reference card for evidence-based research, available for purchase at the Forum. Due to the success of the reference card, we'll develop more on additional topics.
- Explore options for AALNC to offer mentoring programs for members.
- Continue to develop the Forum into an educational and networking experience for new and long-time members.
- Revise the AALNC Principles & Practice and explore opportunities to create an online version.

2. AALNC will be the voice for LNCs

- Produce new and updated AALNC social media platforms
- Roll out the revamped AALNC website in 2nd quarter 2016
- Develop partnerships in the legal and clinical community to exchange speakers, webinars, and journal articles to increase the Association's visibility

3. Sound business model for AALNC

- Revisit and update the strategic plan for 2015-2016
- Reinvest 2015 operating surplus into new and future AALNC projects
- Continue exploring and adding member benefits.
- Work on branding our message as the industry leader for education and networking to all LNCs. Make AALNC *the* place to be for education and networking.

If you missed this year's AALNC Forum, please mark your calendars for the AALNC Education and Networking Forum from April 21-23, 2016 in Charlotte, NC.

Varsha Desai BSN, RN, CNLCP, LNCC
President, AALNC

June 2015 Editor's Note

Wendie Howland
MN, RN-BC, CRRN, CNLCP, LNCC

Editor, JLNC

Welcome to the June 2015 issue of the Journal of Legal Nurse Consulting. I hope you have all completely recovered from PSSD (post-snow stress disorder) and are free to enjoy the return of Demeter for her six months of life aboveground.

We're focusing on electronic health records (EHR), and I must say, I've learned a lot of very interesting things while we've been putting it together. One thing that struck me was the stark contrast between the early rosy predictions of integration, accessibility, and accuracy and the emerging reports of fragmentation, confusion, and self-propagating errors. We've been planning this issue for a year during which professional, popular, and social media offer accounts of serious problems more and more often.

I don't know the solution. Some writers I've seen are starting to recall the days of handwritten notes with a wistfulness that's almost endearing. Yes, I do remember the days when a ward clerk would approach me with a hopeful, "Do you read Barnett?" as if Dr. Barnett's handwriting were an exotic foreign script requiring special expertise to translate (it did). I also remember being able to flip through a chart and pull out notes from different services or providers by color-coded form, handwriting, or fountain pen ink with ease.

While putting this issue together, one thing that struck me was the stark contrast between the early rosy predictions of integration, accessibility, and accuracy and the emerging reports of fragmentation, confusion, and self-propagating errors.

Many LNCs who get big EHR files, in their varied forms, get cross-eyed looking at hundreds -or thousands- of nearly-identical pages. While Adobe and OCR (optical character recognition) are great helps, they can't recognize errors hiding like needles in haystacks. And let's not even start with the dictation bloopers. We'll share some that will make you chuckle. If we can't fix it, we might as well laugh.

Apropos of finding useful things in big piles, I'd like to offer a special shout-out to Barb Boschert and her crew of volunteers who took up a monumental task: indexing every issue of the last ten years of JLNC. Barb received an award for outstanding service to the Association in Indianapolis, and we all owe her a debt of gratitude. Thank her when you see her!

Wendie A. Howland
whowland@howlandhealthconsulting.com

FAN MAIL

I love the design and "flavor" of the new AALNC Journal! While much of the information in the old issues was good, it was embedded in more scholarly and stiff language. The journal was less visually appealing, too.

Articles now are so interesting and functional in the sense that they are useful for nurses in their daily practice. The design, colors and graphics draw the reader right in. Readers may consider branching out within his or her own practice or even consider submitting an article!

Linda Husted, MPH, RN, CNLCP, LNCC, CCM, CDMS, CRC
East Setauket, New York

INCREASED VISIBILITY FOR JLNC

I am planning in the very near future to post about the JLNC and JNLCP full text and then to my ten or so online lists and to relevant library-related lists.

It is wonderful to have both of these journals available at no cost to all readers and this will make them more prominent online, as my lists are public and search engine indexed. I will also list these journals in my Social Work and Public Health Research Guides on the Temple University research guide website as well as my own copies of these guides on Google Sites.

David Dillard, Temple University
Philadelphia, PA

FROM THE LNCEXCHANGE

'The president-elect of the American Medical Association says there is "a crying need" to make electronic health record systems "time-saving rather than efficiency-diminishing."

Electronic health record systems are so complicated and poorly designed that they are impacting the quality of doctors' clinical decisions and challenging the sustainability of their practices.'

For the full article, click on:

http://www.healthleadersmedia. com/content/TEC-308463/EHR-Systems-Immature-Costly-AMA-Says

Joanne Walker RN CNOR
Palmdale, CA

EHR PROBLEMS: GET THE EAR OF ONC'S SENIOR POLICY ANALYST

To the editor,

Some weeks ago, I corresponded with an attorney and Senior Policy Advisor to the Office of the National Coordinator for Health Information Technology (ONC). The ONC is that division of the Department of Health and Human Services to carry out the mandate to have all patients' records on Electronic Health Records Systems (EHRs) as soon as possible.

One of the topics of interest is the difficulties attorneys are experiencing with EHRs in carrying out their duties as organizations' legal counsel, as plaintiff's attorneys, or as defense attorneys. The ONC has observed that they are hearing of no such difficulties in, for example, health law and health law professionals meetings such as the American Health Lawyers Association (AHLA). My own experience is that increasing numbers of attorneys are conveying to me that their tasks are becoming much more difficult with EHRs for a variety of reasons. However, I have no means to substantiate this. It is this latter point that I am seeking to test and to facilitate informative communications with policymakers.

Please consider this request:

Write a letter addressed to ONC Senior Policy Advisor, either directly or, if you prefer, in care of me. If the latter, send me the PDF version and I will immediately pass it along. Arbitrarily I provide the following recommendations and guidance:

1. One or two pages (again, in .pdf, so it cannot be altered.)

2. Description of at least one specific example of an inconvenience, additional cost, or other problematic change in your work that has arisen because of the use of EHR rather than a paper record.

3. *You are welcome to send your letter anonymously if you deem this necessary. However, it would be better though if you identified yourself in the letter and, even better, offered the ONC an opportunity (and means) to contact you directly to follow up.*

If you have any questions or prefer to discuss a different means by phone, you are welcome to contact me. Thank you for your interest in the subject matter and for your help.

Sincerely,

Reed D. Gelzer, MD, MPH, Co-Chair, HL7 EHR Standards Workgroup, Co-Facilitator, HL7 Records Management and Evidentiary Support Workgroup
Newbury, NH; Philadelphia, PA
r.gelzer@myfairpoint.net

ERRATUM

The last issue's Presidential Pearl credited to Elizabeth Zorn listed her as past president of the AALNCP. She is, of course, past president of the AALNC.

FROM A 2014 MEDLINE ONLINE DISCUSSION ON EHR:

Recommendations for doctors who use EHRs: **1.** Face me, not the computer. **2.** Do not swear at the computer and tell me how bad it is. I do not care about your woes with computers. You should have paid better attention during training sessions. **3.** Do not use a scribe. A new person in the room will ruin our communication. **4.** Share the online record with me as we progress through the exam. I can read, even scientific terminology."

— Patient comment

NEWS ITEM

Last November, the CFO of Shelby Regional Medical Center in Texas pled guilty to falsely attesting to the meaningful use program on behalf of the hospital during the 2012 reporting period. He also pled guilty to aggravated identity theft for using a hospital worker's name to falsely attest to meaningful use. The false attestations resulted in Shelby and other hospitals owned by Tariq Mahmood to receive close to $17 million in incentive payments from CMS. Mahmood was sentenced to 11 years in prison for the health care fraud last month. The CFO has agreed to pay $4.4 million in restitution for his part in the fraudulent scheme. He will be sentenced later this month and could get up to seven years in federal prison.

Linn Foster Friedman
Posted In Health Information Privacy

http://www.dataprivacyandsecurityinsider.com/2015/05/hospital-cfo-must-pay-4-4-million-for-falsely-attesting-to-meaningful-use/

ACTUAL DICTATION BLOOPERS FROM REAL CASES

+ Review of systems green is completely unremarkable I have signed it and it just bothers electronic medical record with the exception of as noted in history of present illness

+ yada me sites … fasciotomy site

+ He also acknowledges that he is at dinner person is Alyce been there to help others as a hard time accepting help himself he is frustrated that he is not able to help others away he has in the past.

+ Scene 4 basic narrower Val … Seen for basic neuro eval

+ Ruled out for Pullman area blind … Ruled out for pulmonary emboli

+ Fiber-optic larynx Oscar be for this idea, fair and goalless offer geo-phase … Fiberoptic laryngoscopy, pharyngoesophageal phase

+ Get a soffit Graham … Get an esophagram

A Review of Electronic Health Records for Legal Nurse Consultants

Bryan A. Wilbanks, DNP, CRNA

Use information management systems (IMS) is rapidly growing as hospitals transition to the electronic documentation. Information management systems have just recently been put into widespread clinical use in response to legislation promoting the use of health information technology. The purpose of this paper is to review the history and use of electronic health records with a focus on its significance to the practice of legal nurse consultants.

Information management systems (IMSs) are used to acquire, process, and record health care data specific to the medical or nursing care given at a specific location. Any IMS must be customized to the characteristics of its end users and work environment (Wilbanks, 2013). Consequently, each IMS implementation is unique. Automatic acquisition and recording patients' physiological data (e.g., heart rate, blood pressure, oxyhemoglobin saturation, etc.) allows the clinician to focus more on deliveering patient care and less on generating documentation. IMSs can improve the patient record accuracy, completeness, and legibility if they are appropriately configured and implemented into clinical settings. While historically IMSs have not enjoyed widespread acceptance, recent legislation are making them ubiquitous in modern healthcare.

The American Recovery and Reinvestment Act (ARRA) of 2009 promoted the meaningful use of health information technology and set the groundwork for widespread conversion to electronic health records (EHR) (J. Stonemetz, 2011). These provisions were outlined in the Health Information Technology for Economic and Clinical Health Act (HITECH) and included financial incentives (Blumenthal & Tavenner,

2010). "Meaningful use" is defined by a delineated set of objectives to be met in order for the facility to receive financial reimbursement or other incentive. Some include maintaining up-to-date patient health histories, vital signs, medication lists, allergy lists, and summaries of delivered patient care. Clinical use of decision support tools to promote patient safety and quality of care is a major objective of the HITECH Act. The purpose of this paper is to review the history and use of electronic health records with implications for legal nurse consultants. A review of important concepts specific to electronic documentation is included.

A BRIEF HISTORY OF THE ELECTRONIC HEALTH RECORD

The term "electronic health record" does not currently have a single universal definition. It is used in many diverse settings and has many different types of associated data (Hayrinen, Saranto, & Nykanen, 2008). The basic definition as defined by the International Organization for Standardization (ISO) is, "a repository of patient data in digital form, stored and exchanged securely, and accessible by multiple authorized users" (2004). An EHR is used to define patient care objectives, document patient care delivery, and promote assessment of patient responses. The EHR is a powerful tool for clinical decision support. The environment the EHR is implemented determines the precise form the EHR takes. Taking the same IMS and implementing it into two different settings can result in completely different systems because of the different human-computer interactions; system users and patients alter the way the system is used in real-world settings.

The first use of electronic computers in a health care setting involved roles in clinical decision support, management, and financial applications (Berner,

Detmer, & Simborg, 2005). One of the first EHR systems to be used in clinical practice was COSTAR (Comprehensive Medical Information System for Ambulatory Care) and was initially implemented into a single primary medical care practice located in Boston, Massachusetts, in 1969 (Barnett et al., 1982). In 1978, COSTAR was made publically available for implementation at other primary medical practice clinics.

In 2009, when approximately 10% of all hospitals used EHRs, the ARRA of 2009 designated $19 billion to promote adopting health information technology into clinical practice (Blumenthal, 2009). ARRA provided that Medicare would give financial incentives to organizations demonstrating "meaningful" use of an EHR system by 2011, with the incentives potentially maxing out at $44,000 in 2016 when the incentives expired. Additionally, Medicare implemented a schedule of reduced reimbursement rates for physicians that failed to "meaningfully" utilize EHRs by 2015, with the penalty increasing 1% annually over a three-year period.

These changes were meant to improve the quality of health care, improve patient safety, and help to control health care costs. However, information technology in clinical settings has been associated with unintended consequences, defined as adverse events that are a direct result of the implementation or use of information technology in clinical settings (Meeks et al., 2014).

IMS IN PRACTICE

A modern IMS (Jerry Stonemetz & Ruskin, 2008) includes proprietary software, computer hardware, and possibly a physiological device interface through which the documentation system communicates with patient monitoring equipment.

The IMS uses a local area network (or possibly a wireless network) to connect

to the main database server for data storage and retrieval. This network allows automated data sharing between different hospital departments. Data collected in one department can automatically populate corresponding data fields in the EHR of other departments (i.e., patient allergies or the name of surgical procedure do not need to be re-entered in the intraoperative anesthesia record if they were entered in the preoperative department).

Exact features, functionality, and connectivity to other EHRs depend on the particular IMS vendor; there are no universally accepted guidelines for this. An IMS may be restricted to a given area of patient care, or it could be fully integrated into a hospital's EHR database, allowing it to communicate with other hospital departments, such as laboratory services or nursing units. IMSs were intended to be beneficial in generating patient care records, clinical decision support, quality assurance, quality improvement, research purposes, automated charge capturing, and patient tracking (Shah, Tremper, & Kheterpal, 2011).

Some of the earliest IMSs in clinical use were generic data-capturing systems created by anesthesia providers. Their main purpose was to automatically capture and document physiological parameters from vital sign monitors and anesthesia machines (Muravchick et al., 2008). These were used at a specific location (i.e., not widely used or available commercially), and a system's capabilities were limited by its designer's computer science knowledge and ability. Today, extensive customization is needed to realize many of the benefits of an IMS.

The major benefits of these systems are related to the ability to search and query the databases they create. Effective clinical decision support tools (Chau & Ehrenfeld, 2011) can monitor the collected patient data in real time to

Information technology in clinical settings has been associated with unintended consequences, adverse events that are a direct result of implementing or using information technology.

provide immediate feedback to the health care provider according to pre-defined sets of rules (e.g., reminder to re-dose antibiotics during long surgical procedures, or alert the provider to a failure to record patient vital signs for a predetermined period of time).

Many studies suggested that electronic documentation produces more accurate and complete documentation than paper (Cook, McDonald, & Nunziata, 1989; Lerou, Dirksen, van Daele, Nijhuis, & Crul, 1988; Reich et al., 2000). Wrightson (2010) performed a chart review that showed no statistically significant difference in information completeness between electronic and manual records, though incompleteness varied between the two. Electronic records were more complete in respect to the drugs administered and data elements that could be automatically imported from electronic devices (e.g., physiological monitoring devices or gas analyzers). Handwritten patient records in Wrightson's study were more complete in patient weight, name of surgeons performing the procedure, patient physical status score, and descriptions of equipment used in patient care. Thrush (1992) suggested that observer bias, missed vital sign readings, and memory recall inaccuracies could be avoided with automated charting systems; furthermore, Thrush's study noted that clinicians were less likely to record extreme physiological values and to "smooth" the recorded vital signs to create the "railroad" vital sign tracks that reflect a more stable clinical picture. Automated

charting of patients' physiological parameters from vital sign monitoring devices may be more representative of actual values. Underreporting of adverse events has been reported in several studies (Benson et al., 2000; Sanborn, Castro, Kuroda, & Thys, 1996; Simpao, Pruitt, Cook-Sather, Gurnaney, & Rehman, 2012), and automated collection of physiological patient data may make detecting adverse events easier.

DECISION SUPPORT TOOLS

An IMS can include real-time clinical decision support tools to insure compliance with national patient care standards and quality improvement/assurance initiatives (Chau & Ehrenfeld, 2011). Clinical decision support tools can be used to improve patient outcomes by preventing errors, supporting a quicker response to adverse events, and by providing a dependable mechanism to track adverse events (Bates & Gawande, 2003). Automated chart reviews, before confirming the information in the chart and making it a permanent legal record of care, can be used to detect empty fields. This requires the clinician to enter missing mandatory information in order to finalize the chart. These types of decision support tools could potentially decrease legal liability and malpractice claims (Chau & Ehrenfeld, 2011).

Many types of clinical decision support tools are in use in clinical practice, with many focusing on achieving the national patient safety goals as set forth by the Joint Commission on the Accreditation

of Healthcare Organizations (JCAHO). Compliance with preoperative antibiotic administration (B. G. Nair, Newman, Peterson, & Schwid, 2011; O'Reilly, Talsma, VanRiper, Kheterpal, & Burney, 2006; Wax et al., 2007) and appropriate beta-blocker administration during surgical procedures (B. Nair, Newman, Peterson, & Schwid, 2012; B. G. Nair et al., 2012) improved at many facilities through automated reminders to anesthesia providers. Compliance with many national standards or goals could be easily assessed and documented with an electronic reservoir of data.

IMS AND RESEARCH

As the use of IMSs increase so will the amount of data available for research. A study by Junger et al. (2001), one of the first to use an IMS database for clinical research, sought to identify risk factors for postoperative nausea and vomiting, widely documented in the published literature. It demonstrated that an IMS database could be used for clinical research, reaching the same conclusions as more traditional clinical research methods. In 2008, Vigoda et al. studied identifying gender disparities in the treatment of coronary artery disease, and demonstrated that the databases generated by multiple IMS could be pooled and used for epidemiological research.

IMS AND FINANCIAL EFFECT

Facilities can automate billing for services and supplies using an IMS, insuring that many potential charges are automatically captured. Many IMS have a point-of-care charge-capturing system in the user interface. Automated charge rules can be built in to automatically charge for certain supplies in response to the documentation of certain events (e.g., automatically entering professional fees for arterial line insertion and supplies used when the clinician documents arterial line placement). The databases created by an IMS can be used to help

guide staffing decisions for the entire operating room, which could save money by allowing appropriate utilization of human resources (Junger et al., 2002). Reich et al. (2006) demonstrated that an IMS reduces the time it takes to bill for anesthesia services and improves compliance with billing requirements while reducing personnel time.

IMPLICATIONS OF IMS FOR LEGAL NURSE CONSULTANTS

Many implications of IMS of interest to legal nurse consultants are related to three primary functions addressed below. These are primarily related to the effect of documentation quality as it applies to malpractice liability, confidentiality laws, data ownership disputes, and identification of insurance fraud (Mangalmurti, Murtagh, & Mello, 2010).

DATA COLLECTION

The use of IMS can greatly increase the amount of information collected for documentation into the EHR (Wilbanks, 2014). This can help prove or disprove malpractice liability (Bowman, 2013) by providing a more complete and accurate picture of events. This might include identifying contradicting documentation (e.g., two different healthcare providers who document very different information about the same event). The legal nurse consultant should keep in mind that the gold standard for electronic documentation accuracy is that it is written contemporaneously as direct observations of what the documentation describes, or by direct corroboration with the individual who generated the notes (Wilbanks, 2014). Therefore, the legal nurse consultant needs the clinician who generated the documentation to validate the documentation, or find witnesses who were present at the event who can testify about it.

Electronic documentation can be difficult to evaluate because it's difficult to read. *Readability* (Wilbanks, 2014 #342) is defined as how well the final electronic healthcare record provides an understandable report of care. The concept of EHR readability is similar to the concept of legibility of manual paper-based records. While EHR may provide a more accurate and complete narrative, it can be much more difficult to read.

Metadata is defined as "data about data" (McLean, Burton, Haller, & McLean, 2008). The IMS creates it whenever data is entered or altered. Metadata can be used to track data entry times or documentation changes. Remember that physiological monitoring data is entered automatically so is much more likely to be accurate. If severely abnormal vital signs are altered in the IMS database, e.g., to make a patient condition appear more stable, then metadata could prove this.

Metadata can also be used to verify documentation truthfulness, if, for example, an anesthesiologist falsifies documentation by entering that the patient arrived in the recovery room with no complications, and the metadata clearly shows that the post-operative note was actually entered almost seven hours *before* arrival to the recovery room (Vigoda & Lubarsky, 2006). Metadata might be able to show if vital signs were automatically collected, manually entered, or altered. In addition, the altered documentation can be compared to the original data to show the difference between the values. Metadata is not part of the usually-viewed clinical record *per se*, but it is stored in the IMS database (McLean et al., 2008). Late electronic documentation that was entered to appear as if it were charted earlier is easy to identify using metadata (McLean et al., 2008).

Artifacts are erroneous data that were automatically collected and entered into the EHR (Wilbanks, 2014). These must be distinguished from real abnormal readings that were deceptively altered. Proving whether documentation was altered because of artifacts or as a willful attempt to conceal abnormal values can be very difficult, and will most likely require evaluation by an expert witness.

DATA ENTRY

EHR documentation is usually generated using computer-assisted data entry methods that must be custom-built to the specific requirements of the end-users (Duftschmid & Wrba, 2004). Data can be entered using standard electronic data selection methods (Chen, Enberg, & Klein, 2007)(e.g., item selection through radio-buttons or drop-down menus) or using complete blocks of standardized text that must be manually edited using a keyboard if actual patient care is different from the pre-defined text (Wilbanks, Moss, & Berner, 2013).

Using standardized templates that must be changed manually can result in inaccurate documentation if the clinician does not use them as intended. In one operating room study (Wilbanks et al., 2013), clinicians documented that they performed neuromuscular function testing before endotracheal extubation in all of the general anesthetic cases observed in the study, even though 20% of those patients were never actually monitored for neuromuscular function using a nerve stimulator. This shows how inaccurate documentation can result from using pre-defined templates if defaults are not changed to reflect actual events. If legal nurse consultants evaluate how data are actually entered into the medical record, then they might be able to identify inaccurate documentation that results from the use of standardized data entry templates.

Copy-and-paste (Dimick, 2008; Gelzer et al., 2009; Hirschtick, 2006; Markel, 2010; Siegler & Adelman, 2009) can cause errors when a clinician enters patient chart data into the computer operating system into a different patient's

medical record to save time writing it *de novo*. Copy-and-paste functionality may decrease end-user workload and total documentation time, but can result in decreased documentation quality that directly endangers patient safety and can increase legal liability by promoting medical errors and fraudulent billing (Dimick, 2008). Copy-and-paste is very similar to using pre-defined templates; however, copy-and-paste is re-use of notes from a specific patient to a different patient (Gelzer et al., 2009), as compared to not updating pre-defined default generic statements used for all patients.

CLINICAL DECISION-MAKING

Clinical decision support tools can result in errors from serious design flaws, selecting and applying improper decision support rules, human errors, poor end-user training, alert fatigue, or improper use (Bowman, 2013). Two concepts are important here.

Alert fatigue occurs when the system user stops responding to decision support alerts after excessive false alarms (Ash, Sittig, Campbell, Guappone, & Dykstra, 2007). This could mean the clinician ignores warnings of an impending adverse event (Bowman, 2013), such as giving a drug to a patient with an allergy to it or not recognizing a cardiac dysrhythmia.

Automation bias occurs when a clinical decision support tool suggests something inappropriate, and the clinician follows the advice (Bowman, 2013). It is important to remember that decision support tools are not completely reliable, and the clinician is ultimately responsible for patient care.

SUMMARY

Although the introduction of electronic health records and information management systems occurred decades ago they have been very slow to gain acceptance and widespread use in clinical practice. The 2010 HITECH Act, government support of the use of health care technology in clinical practice, and CMS requirements have each contributed to increased IMS use. IMS can improve the quality of patient care and documentation records, and they have also resulted in unintended consequences. IMS can:

- Play an important role in quality improvement and assurance initiatives
- Improve the accuracy and completeness of the generated EHR
- Improve financial reimbursements through a more accurate and efficient billing system
- Serve as a database for clinical research
- Facilitate adherence to documentation standards of practice

The legal nurse consultant must be able to analyze the large volumes of information available in the EHR and understand the effect that using electronic data collection, data entry, and clinical decision support tools can have on patient care.

REFERENCES

Ash, J. S., Sittig, D. F., Campbell, E. M., Guappone, K. P., & Dykstra, R. H. (2007). Some unintended consequences of clinical decision support systems. *AMIA Annu Symp Proc*, 26-30.

Barnett, G. O., Zielstorff, R. D., Piggins, J., McLatchey, J., Morgan, M. M., Barrett, S. M., . . . McDonnell, G. (1982). Costar: A comprehensive medical information system for ambulatory care. *Proceedings of Annual Symposium on Computer Application in Medical Care*, 2, 8-18.

Bates, D. W., & Gawande, A. A. (2003). Improving safety with information technology. *New England Journal of Medicine*, 348(25), 2526-2534.

Benson, M., Junger, A., Fuchs, C., Quinzio, L., Bottger, S., Jost, A., . . . Hempelmann, G. (2000). Using an anesthesia information management system to prove a deficit in voluntary reporting of adverse events in a quality assurance program. *J Clin Monit Comput.*, 16(3), 211-217.

Berner, E. S., Detmer, D. E., & Simborg, D. (2005). Will the wave finally break? A brief view of the adoption of electronic medical records in the United States. *Journal of the American Medical Informatics Association, 12*(1).

Blumenthal, D. (2009). Stimulating the adoption of health information technology. *New England Journal of Medicine, 360*(15), 1477-1479. doi: 10.1056/NEJMp0901592

Blumenthal, D., & Tavenner, M. (2010). The "meaningful use" regulation for electronic health records. *New England Journal of Medicine, 363*(6), 501-504. doi: 10.1056/NEJMp1006114

Bowman, S. (2013). Impact of electronic health record systems on information integrity: quality and safety implications. *Perspect Health Inf Manag, 10*, 1c.

Chau, A., & Ehrenfeld, J. M. (2011). Using real-time clinical decision support to improve performance on perioperative quality and process measures. *Anesthesiol Clin, 29*(1), 57-69. doi: 10.1016/j.anclin.2010.11.002

Chen, R., Enberg, G., & Klein, G. O. (2007). Julius--a template based supplementary electronic health record system. *BMC Med Inform Decis Mak, 7*, 10. doi: 10.1186/1472-6947-7-10

Cook, R. I., McDonald, J. S., & Nunziata, E. (1989). Differences between handwritten and automatic blood pressure records. *Anesthesiology, 71*(3), 385-390.

Dimick, C. (2008). Documentation bad habits. Shortcuts in electronic records pose risk. *J ahima, 79*(6), 40-43; quiz 45-46.

Duftschmid, G., & Wrba, T. (2004). A tool for the design of clinical forms supporting end-user integration. *Medical Informatics & the Internet in Medicine, 29*(1), 29-41.

Ehrenfeld, J. M., & Rehman, M. A. (2011). Anesthesia information management systems: a review of functionality and installation considerations. *Journal of Clinical Monitoring and Computing, 25*(1), 71-79. Epub 2010 Aug 2024.

Gelzer, R., Hall, T., Liette, E., Reeves, M. G., Sundby, J., Tegen, A., . . . McCormick, K. (2009). Auditing copy and paste. *J ahima, 80*(1), 26-29; quiz 31-22.

Hayrinen, K., Saranto, K., & Nykanen, P. (2008). Definition, structure, content, use and impacts of electronic health records: a review of the research literature. *International Journal of Medical Informatics, 77*(5), 291-304. doi: 10.1016/j.ijmedinf.2007.09.001

Hirschtick, R. E. (2006). A piece of my mind. Copy-and-paste. *Jama, 295*(20), 2335-2336. doi: 10.1001/jama.295.20.2335

ISO/DTR. (2004). Health Informatics - Electronic Health Record - definition, scope, and context.

Junger, A., Benson, M., Quinzio, L., Michel, A., Sciuk, G., Brammen, D., . . . Hempelmann, G. (2002). An Anesthesia Information Management System (AIMS) as a tool for controlling resource management of operating rooms. *Methods of Information in Medicine, 41*(1), 81-85.

Junger, A., Hartmann, B., Benson, M., Schindler, E., Dietrich, G., Jost, A., . . . Hempelmannn, G. (2001). The use of an anesthesia information management system for prediction of antiemetic rescue treatment at the postanesthesia care unit. *Anesthesia and Analgesia, 92*(5), 1203-1209.

Lerou, J. G., Dirksen, R., van Daele, M., Nijhuis, G. M., & Crul, J. F. (1988). Automated charting of physiological variables in anesthesia: a quantitative comparison of automated versus handwritten anesthesia records. *Journal of Clinical Monitoring and Computing, 4*(1), 37-47.

Mangalmurti, S. S., Murtagh, L., & Mello, M. M. (2010). Medical malpractice liability in the age of electronic health records. *N Engl J Med, 363*(21), 2060-2067. doi: 10.1056/NEJMhle1005210

Markel, A. (2010). Copy and paste of electronic health records: a modern medical illness. *Am J Med, 123*(5), e9. doi: 10.1016/j.amjmed.2009.10.012

McLean, T. R., Burton, L., Haller, C. C., & McLean, P. B. (2008). Electronic medical record metadata: uses and liability. *J Am Coll Surg, 206*(3), 405-411. doi: 10.1016/j.jamcollsurg.2007.09.018

Meeks, D. W., Takian, A., Sittig, D. F., Singh, H., & Barber, N. (2014). Exploring the sociotechnical intersection of patient safety and electronic health record implementation. *Journal of the American Medical Informatics Association, 21*(e1), e28-e34.

Muravchick, S., Caldwell, J. E., Epstein, R. H., Galati, M., Levy, W. J., O'Reilly, M., . . . Vigoda, M. M. (2008). Anesthesia information management system implementation: a practical guide. *Anesthesia and Analgesia, 107*(5), 1598-1608. doi: 10.1213/ane.0b013e318187bc8f

Nair, B., Newman, S., Peterson, G., & Schwid, H. (2012). Smart Anesthesia Manager (SAM) - A Real-time Decision Support System for Anesthesia Care during Surgery. *IEEE transactions on bio-medical engineering.*

Nair, B. G., Newman, S. F., Peterson, G. N., & Schwid, H. A. (2011). Automated electronic reminders to improve redosing of antibiotics during surgical cases: comparison of two approaches. *Surg Infect (Larchmt). 12*(1), 57-63. Epub 2010 Dec 2020.

Nair, B. G., Peterson, G. N., Newman, S. F., Wu, W. Y., Kolios-Morris, V., & Schwid, H. A. (2012).

Improving documentation of a beta-blocker quality measure through an anesthesia information management system and real-time notification of documentation errors. *Joint Commission journal on quality and patient safety / Joint Commission Resources, 38*(6), 283-288.

O'Reilly, M., Talsma, A., VanRiper, S., Kheterpal, S., & Burney, R. (2006). An anesthesia information system designed to provide physician-specific feedback improves timely administration of prophylactic antibiotics. *Anesthesia and Analgesia, 103*(4), 908-912.

Reich, D. L., Kahn, R. A., Wax, D., Palvia, T., Galati, M., & Krol, M. (2006). Development of a module for point-of-care charge capture and submission using an anesthesia information management system. *Anesthesiology, 105*(1), 179-186; quiz 231-172.

Reich, D. L., Wood, R. K., Jr., Mattar, R., Krol, M., Adams, D. C., Hossain, S., & Bodian, C. A. (2000). Arterial blood pressure and heart rate discrepancies between handwritten and computerized anesthesia records. *Anesthesia and Analgesia, 91*(3), 612-616.

Sanborn, K. V., Castro, J., Kuroda, M., & Thys, D. M. (1996). Detection of intraoperative incidents by electronic scanning of computerized anesthesia records. Comparison with voluntary reporting. *Anesthesiology, 85*(5), 977-987.

Shah, N. J., Tremper, K. K., & Kheterpal, S. (2011). Anatomy of an anesthesia information management system. *Anesthesiol Clin, 29*(3), 355-365. doi: 10.1016/j.anclin.2011.05.013

Siegler, E. L., & Adelman, R. (2009). Copy and paste: a remediable hazard of electronic health records. *Am J Med, 122*(6), 495-496. doi: 10.1016/j.amjmed.2009.02.010

Simpao, A. F., Pruitt, E. Y., Cook-Sather, S. D., Gurnaney, H. G., & Rehman, M. A. (2012). The reliability of manual reporting of clinical events in an anesthesia information management system (AIMS). *Journal of Clinical Monitoring and Computing.* doi: 10.1007/s10877-012-9371-z

Stonemetz, J. (2011). Anesthesia information management systems marketplace and current vendors. *Anesthesiol Clin, 29*(3), 367-375. doi: 10.1016/j.anclin.2011.05.009

Stonemetz, J., & Ruskin, K. (2008). Anesthesia informatics. London: Springer.

Thrush, D. N. (1992). Are automated anesthesia records better? *Journal of Clinical Anesthesia, 4*(5), 386-389.

Vigoda, M. M., & Lubarsky, D. A. (2006). Failure to recognize loss of incoming data in an anesthesia record-keeping system may

have increased medical liability. *Anesthesia and Analgesia, 102*(6), 1798-1802. doi: 10.1213/01.ane.0000217235.25350.5e

Vigoda, M. M., Rodriguez, L. I., Wu, E., Perry, K., Duncan, R., Birnbach, D. J., & Lubarsky, D. A. (2008). The use of an anesthesia information system to identify and trend gender disparities in outpatient medical management of patients with coronary artery disease. *Anesthesia and Analgesia, 107*(1), 185-192. doi: 10.1213/01.ane.0000289651.65047.3b

Wax, D. B., Beilin, Y., Levin, M., Chadha, N., Krol, M., & Reich, D. L. (2007). The effect of an interactive visual reminder in an anesthesia information management system on timeliness of prophylactic antibiotic administration. *Anesthesia and Analgesia, 104*(6), 1462. doi: 10.1213/01.ane.0000263043.56372.5f

Wilbanks, B. A. (2013). An integrative literature review of contextual factors in perioperative information mangagement systems. *CIN: Computers, Informatics, Nursing, 31*(12), 622-628.

Wilbanks, B. A. (2014). An integrative literature review on accuracy in anesthesia information management systems. *CIN: Computers, Informatics, Nursing, 32*(3), 56-63.

Wilbanks, B. A., Moss, J. A., & Berner, E. S. (2013). An observational study of the accuracy and completeness of an anesthesia information management system: recommendations for documentation system changes. *Comput Inform Nurs, 31*(8), 359-367. doi: 10.1097/NXN.0b013e31829a8f4b

Wrightson, W. A. (2010). A comparison of electronic and handwritten anaesthetic records for completeness of information. *Anaesth Intensive Care., 38*(6), 1052-1058. ❧

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Electronic Health Records: The Promise and Reality

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EHRs held out the promise of faster, better and more coordinated healthcare and, on this promise, became a regulatory requirement for healthcare providers. Unfortunately, theory and practice are not the same. The problems with paper medical records have been changed into new and different problems with EHRs. Many hidden factors affect the safety and usability of EHRs. This article provides an overview of these factors.

Information about an individual's most intimate details concerning her health, diseases, treatments, address, employer information and financial information used to be written down by hand in the patient's chart and physically stored securely in the medical records room. Lab test results were printed out on the test result form and pasted into the record. Use of prior recorded healthcare information to assist in treating a current patient required physically retrieving the chart from medical records department and sending it to the nursing unit for the physician to review. Release of healthcare information to other providers used to require the medical records department to locate and duplicate the chart. Then came the computer and the ability to store records and data electronically. The Electronic Healthcare Record (EHR) was a logical extension of the digitalization of data and the promise that it held.

THE EHR REGULATORY DREAM

In 2009, the American Reinvestment & Recovery (ARRA) Act changed the way in which American medical clinicians

documented patient care. The Health Information Technology for Economic and Clinical Health (HITECH) Act required that healthcare providers implement Electronic Heath Records (EHR), that physicians demonstrate meaningful use and that those providers who do not implement an EHR system pay financial penalties starting in 2015. (CDC 2012)

MEANINGFUL USE

"Meaningful use" was a mandate from the Office of the National Coordinator of Health Information Technology or the ONC. (CDC 2014) The goal of "meaningful use" was to ensure the use of interoperable electronic records throughout the US healthcare delivery system so as to provide for the electronic exchange of health information to improve the quality of care and to provide information on the quality of care.

The intended goals of meaningful use compliance were:

- Better clinical outcomes
- Improved population health outcomes
- Increased transparency and efficiency
- Empowered individuals
- More robust research data on health systems

The goals of EHR technology were to:

- Improve quality, safety, efficiency, and reduce health disparities
- Engage patients and family
- Improve care coordination, and population and public health
- Maintain privacy and security of patient health information

Meaningful use of EHRs was designed to become part of the American healthcare system in a three stages: *Data Capture and Sharing* (2011), *Advanced Clinical Processes* (2013) and *Improved Outcomes* (2015). CMS provided incentive payments to healthcare providers to encourage adoption of the EHR. These

incentive payments range from $44,000 over 5 years for the Medicare providers and $63,750 over 6 years for Medicaid providers (starting in 2011). Participation in the CMS EHR incentive program is totally voluntary, however if participating providers fail to join in by 2015, there will be negative adjustments to their Medicare/Medicaid fees starting at 1% reduction and escalating to 3% reduction by 2017 and beyond. (CMS 2014) In 2015, an estimated 250,000 will face the 1% reduction in CMS payments due to meaningful use non-compliance. (Bell J. 2014)

The belief that technology would eliminate errors and delays in patient care was so intoxicating that, even though the theory had not been tested before being put into practice, the transformation from paper to electronic records was begun in 2010 after passage of the ARRA. What we have now learned is that all we have done is replace one set of problems with another. The problem of "illegible paper records" transformed into "death by legible information overload." The lack of portability of healthcare information became a problem where massive amounts of sensitive data could be stolen by hackers in seconds and dispersed around the world. A problem with too little documentation of care was turned into a problem of less time to provide clinical care. Serious questions have been raised as to whether or not the EHR has succeeded in improving healthcare delivery and outcomes.

THE EHR CLINICAL REALITY

The reality of the EHR revolution is that electronic record created is vastly larger and more difficult for providers to work with than the same record when it was paper. One third of physicians report that EHRs caused deterioration in clinical services. A similar percentage said that EHRs had a negative impact on clinical operations. In one study, the majority of oncologists complained that

EHRs took away from face-to-face time with patients and, even more concerning, 26% said that the new technology decreased their ability to manage their patients' care plans. Two thirds of physicians reported that note-writing took more time. One third stated that it took longer to find and review medical record data with the EHR than without, and a similar percentage reported that it took more time to read other clinicians' notes.

Although the EHR is an enormous data resource, clinicians are having difficulty inputting clinical information and, once the information is in, they are having finding the facts they are most interested in. EHRs provide additional complexity without additional clinical value. (O'Rourke 2014)

Clinician dissatisfaction with EHRs is a result of too much information being presented, much of it repetitious, without any quick and easy way to differentiate the notes of one provider from another. The value of a written word has decreased, because EHRs allow providers to insert large amounts of text into a record by cutting and pasting pre-existing text. Some portions of EHRs self-populate based on information placed in other sections, increasing the amount of information on that page but not adding any new information. On the other hand, the system may generate many new pages even if only one click mark is different. But the biggest problem is that all the information looks the same. The ability to quickly and visually identify a document because of the characteristic handwriting of a particular provider, or the unique note format that a surgical service uses, is lost. Clinicians have to actually read large amounts of text in small font to find the notes they are looking for, then read the note.

INCREASED INACCURACY

Dissatisfaction with EHRs also stems from numerous inaccuracies and incorrect data that occur with their

use. EHRs are not subject to regulatory oversight, and FDA approval prior to use is not required. EHRs were designed to accurately code for payment not treatment.

As a general rule, less than 50% of EHRs are error-free. In one ophthalmology cataract surgery EHR study, only 35% of patient charts were correct, with 59% containing omissions, 1% containing incorrect data and 3% containing both admissions and data. (Pullen 2014) A Veterans Administration study showed that 84% of patient records had at least one documentation error, and the average number of errors per patient chart was 7.8. EHRs have increased the amount of time needed to record a patient visit, but providers quickly learn that what they are looking at in the EHR may not be true.

EHR errors can arise from the computer system hardware and software, or errors can emanate from the information put in by system users. Erroneous quick clicks can create long-lasting errors. Cutting and pasting to save time and to create the appearance of attention to detail creates both information overload problems and allows incorrect data to propagate throughout the record. EHRs are dependent on the data entered by its users. Just because information looks neat and correct doesn't have any bearing on the accuracy of the information displayed. Wrong data is entered or copied into the system looks exactly the same to the EHR as the correct data. (Chesanow, 2014)

All individuals have experienced the difficulty associated with a poorly designed or "not user-friendly" items. Poorly designed items cause end user frustration, variation in use, and errors. Imagine the impact of poorly designed EHRs that are difficult for end users to properly document patient care.

Usability is a term that refers to the ease of use of information technology by end users (Ong, 2011). Three components of usability consider how easy it is to use, how efficient the technology performs and ease of learning (Ong, 2011). Usability directly impacts the end users ability to properly utilize the technology in achieving safety, competent care delivery. Considerations include adherence to workflow, compliance with required fields of documentation, adequate integration testing prior to activation of deployed technology, accurate interfaces, and formalized usability assessments prior to implementations (Ong, 2011).

SAFETY AND USABILITY

The clinical reality of EMRs and their usefulness in litigation are affected by several hidden factors. The legal team may be unaware of the ways in which these factors influence the information within the electronic medical error. Refer to Table 1 for an overview. Let's dig a little deeper into these factors.

ADHERENCE TO WORKFLOW AND COMPLIANCE

There may be flaws in the software design. Some vendors' software is not very easy to use and does not foster a safe look or feel. There are open fields that could be left blank or there are not enough drop-down fields. Users may worry, "The application doesn't have what I need to document. Is it safe to use?"

The word "workflow" is important when considering EHR safety and usability. It alters the way people render care, the steps that they follow, and how compliant they are with the new clinical processes affected by the EHR.

Proper testing of the software is critical step. The IS (informatics support) team must subject the software to rigorous testing of the application in all forms. A missed step may lead to errors. Here are important testing considerations:

- Did the IS staff test the application? How did they test it?
- Did they work with their end users when designing the software?

Poor screen design may lead to medical errors. For example, the system may use open text boxes for weights - an empty box into which a healthcare provider enters a weight. Consider a situation in which physician #1 entered the weight in kilograms. Physician #2 reviewed the weight on a different screen, but the unit of measurement was not indicated on the second screen. The second physician ordered the wrong dose of medication, assuming that the weight was in pounds. The system did not alert

Table 1. Factors in failure: Common problems with EHR elements

Computerized Provider Order Entry (CPOE)	Clinical Decision Support	Bar Code Medication Administration	Technology Related
Inexperienced end user	Non-adherence to computerized alerts	Torn, soiled, wrinkled labels	Multiple passwords
Data overload	Clinician reminders, advice tools	Override medication administration, avoids scanning meds	Insufficient interface design, drop-down menus, documentation fields
Difficulty documenting and communicating using the EHR	Reporting methods	Equipment failure	Loss of connectivity, system slowness
Resistance to comply with CPOE, use order sets, medication reconciliation	Compliance with guidelines, order sets	Incorrect or tampered wristband	Lack of application testing
Time consumption, less time with patient	Documentation templates	Incorrect medication or dose dispensed	Duplicate order entries

the physician of any missing data. It did not request him to specify 150 pounds vs. 70 kilograms, so it failed to alert the provider the measurement was missing.

Obscured information is another design error. For example, the physician prescribed an additional 3mg of Coumadin to equal 6mg total. A second physician reviewing the medical record was unable to see the 6mg had been administered. After hovering over the cells the physician saw a pop-up showing the additional 3mg that were given; it was hidden. This could have resulted in a potential error of re-medication. When there is a lack of visible data, patient safety depends on the end user remembering and looking for these extra steps to find data fields.

INEXPERIENCE, DATA OVERLOAD, AND RESISTANCE

There are many senior physicians who have to attend basic computer classes several times just to learn how to use a mouse and a keyboard. EHRs are designed for improved communication, but some people may not write their notes well if they're not templated out. The providers may not know how to enter data in those specific data fields, so missing communication can be a problem.

EHRs display a tremendous amount of data. Clinicians look at this data electronically. It can be overwhelming; they often cannot find information.

Many physicians are concerned with the possibility of a standardized order set for all the orders. This is a cause of heated contention among physicians. If they do not like the order sets that were developed, they won't use them. Alerts are built directly off of the order sets. If physicians don't use order sets and they choose to just write single order entries they're not going to see the alerts. This shortcut bypasses the safety features of a

clinical decision support system. For example, DVT (deep vein thrombosis) orders should follow DVT screening upon admission or at other points in a hospitalization. If the provider does not use the standardized order sets and the alerts are built off of that, the provider may forget to order the prophylactic medication.

Not every vendor approaches software the same way. Providers who have privileges at more than one healthcare facility must be aware of the nuances of each system. Passwords and procedures may be significantly different. If the provider is unfamiliar with documentation steps, the system may create a block. The software has the ability to do hard stops that prevent a provider from continuing to document until a step is completed. The software may have a soft stop, a message that alerts the provider, who can override it and continue documenting. Aware of the risk of irritating the providers, the software designers may have included a low alert specificity, one that is not really sensitive. Oftentimes the organization may do this because they don't want to get the providers angry with multiple stops that, if present, would contribute to ensured safety.

DEPENDENCY ON TECHNOLOGY

Many people may say, "You know what, everything is in the computer. I don't need to think. I'm good." They become

People can become too reliant on EHR features that drive decision-making. But as we know in the litigation field, nothing replaces the valuable thinking skills of a human being.

over-reliant on technology. As we know in the litigation field, nothing replaces the valuable thinking skills of a human being.

As judged by conversations with clinicians and internet discussion groups, many people are very frustrated with the amount of time that it takes to get into the application and to learn it. There could be interface issues. There could be delays. Any time a facility upgrades or standardizes procedures there could be glitches in the system. There may be delays in response times. A delay in health care seems like hours when there is an immediate need for information. The system application slows during peak use.

NOT ACTIVATING EVIDENCE BASED PROTOCOLS

Evidence-based programs can be embedded into an EHR. These reflect the standard of care for how clinicians are to provide care. Although healthcare providers may activate these, they may not be familiar with all that is available or applicable. Activation of the evidence-based programs may create flow sheet rows in the documentation. For example, at 7:00 PM, a nurse performs a nursing admission assessment of a patient with pneumonia and sepsis. The EHR has evidence-based practice guidelines, but it's 11:00 PM. He's really tired; he leaves without activating them. The next nurse comes on at 11:00 PM. She's busy and she does not think about

the evidence based practice guidelines. Then the day shift nurse comes in at 7:00 AM and says, "Oh my, this patient has pneumonia and sepsis. My guidelines aren't in and I don't have all the appropriate documentation filled in." Twelve hours have gone by without the appropriate documentation.

BAR CODING MEDICATION ADMINISTRATION (BCMA)

In this commonly used system, medication administration is documented directly into the EHR. The process is connected to multiple interfaces such as pharmacy orders and the MAR (Medication Administration Record). The nurse scans the bar code on the medication and the patient's wristband. The medication has to be correctly bar-coded by pharmacy and the patient has to have the appropriate wristband.

Although BCMA is designed to reduce errors, workarounds (shortcuts which subvert the safety features) are common. For example, bar code labels on medications and wristbands can be torn, wrinkled, missing, soiled, or covered with another label. Many times providers will print extra labels. They may have a whole sheet of labels so that they can increase the speed of scanning. They might say, "I have four medications to give. I'm going to scan four times on the labels and I'm going to scan my medicines. I'm going to put them altogether in a little cup and take them to the room." This practice skips the safety check of scanning the patient's wristband at the bedside.

Providers may affix bar code labels to desks, walls, cabinets, and scanners. They may wear them around their wrists and in their pockets. Providers may place these labels in multiple places to make it convenient, but this subverts safety features.

The clinical staffers need to be monitored once barcoding goes into effect

to ensure they are not overriding the system. The wristband might be off, or the staff might be too busy, or the scanner might work correctly. Overriding the medication barcoding process results in deactivating the alerts that would warn the provider that the wrong medication or patient has been selected. The scanner can also malfunction. Devices may be attached to medication carts or the walls in the room. They can get dropped. They can get thrown in the laundry or left on the cafeteria trays. They can be missing. They are very expensive.

TRAINING CONSIDERATIONS

Insufficient training may result in errors. Inadequate training results in incomplete and inaccurate documentation, lack of compliance, medical errors, and overreliance on technology. Critical thinking errors occur, with failure to identify subtleties. Some facilities have dedicated staff for training, whereas in other facilities, the Informatics Support people provide training and have many other responsibilities. When lack of training could have contributed to a medical error, some of the relevant questions to ask include:

- How are the end users trained?
- Is the training environment built correctly for them to go into a playground environment and practice?
- Do they have available training materials?
- Are they going to classes?
- Are they going to webinars?
- Do they have access to tips and tricks about the EHR?
- What compliance standards and guidelines are in place?
- Are there performance-monitoring measures in place during and after training?
- Are managers watching over this?

ADMISSIBILITY: POTENTIAL PROBLEMS OF EHRS AS BUSINESS RECORDS

In light of all of the design and use considerations just presented, one can question the admissibility of an EHR as a business record. Medical records are traditionally admissible as evidence in legal actions as a Hearsay Exception for Records of Regularly Conducted Activity under the federal and state rules of evidence. See e.g. F.R.E. 803 (6). The fundamental bases for this hearsay exception are that the statement was made in writing made at or near the time of observation, by a person with actual knowledge, in the regular course of business and regular practice, unless the sources of information indicate that the information is not trustworthy.

The contemporaneous requirement for the business record exception may be difficult to fulfill with an EHR. Data entries made before and after the point of care are listed along with current point of care data. When a provider cuts and pastes information from an earlier part of the record, or from a prior record of the same patient, it lacks the contemporaneousness of the data contemplated by the rule. See generally Drury B, Gelzer R, Trites P, Electronic Health Records Systems: Testing the Limits of Digital Records Reliability and Trust. Ave Maria Law Rev. Vol. 12:2 pp.257-289 (2014).

The person with actual knowledge requirement for an EHR to be admissible under the business exception rule could also be challenged. When patient history is copied and pasted from a prior encounter, instead of being elicited from the patient or other provider directly, the personal knowledge requirement is not met. The author of the information in data that is copied and pasted may be unknown.

If the sources of information indicate that the information is not reliable, then the business record exception should not apply. Studies have shown that there is a high input error rate in EHRs. Some

errors are easy and obvious to detect, such as the 83-year-old lady whose age is listed as 38, but not all. There is no FDA approval for EHRs as there is for medical devices and tests. There is no systematic accuracy testing of data integrity in EHRs. Audit trails are not required for EHRs used in patient care. Since errors can be found in the majority of EHRs, a court could find a basis for disallowing the admission of an EHR into evidence, if an attorney challenged its veracity.

From a practical standpoint, challenging the veracity and admissibility of ERHs on a regular basis would be self-defeating. The time and cost of authenticating the author of each data entry, along with the time, location and personal knowledge concerning that data entry would be overwhelming. Rather than use EHRs' inaccuracies to prevent the admission into evidence as a business record hearsay exception, it is more useful to selectively use inaccuracies in an EHR in support of a motion to allow investigation into a critical aspect of the case in order to confirm its accuracy. If a reasonable degree of unreliability can be demonstrated, a court should allow discovery of the underlying metadata and audit trail that shows all the particulars about a specific data entry and any changes to it (Terry 2014).

DISCOVERY OF EHRS

Obtaining the EHR for a personal injury client in litigation is still done by way of providing an executed HIPAA-compliant paper authorization form for release of medical records. Various state rules apply regarding maximum costs for production and other specifics. The irony of EHRs is that the requested electronic records are printed out on paper and sent by mail. There is nothing electronic about the electronic records received by an attorney or legal nurse consultant. Although imaging studies are now almost exclusively provided in electronic format on disc, not so with the paper records.

In order to efficiently receive and use medical information from an EHR, you first have to make it electronic again by scanning the documents into your computer system. In order to do that, one needs a top-quality, high-volume scanner with a professional-grade PDF software program. The system needs to be able to scan both sides of the documents at once and any eliminate blank pages from the saved scanned PDF file. File formats must be kept to a minimum acceptable size so as to not use overwhelming amounts of data storage space. Condensed PDF files and a print setting of 300dpi black print allow voluminous documents to be scanned into relatively small files compared with other settings.

An EHR printout does not necessarily show all of the patient's healthcare information, only that which is displayed on the screen to be printed. EHRs are used on computer terminals in real time. Often there are underlying screens of information that are not visible on the main screen. While it is unrealistic for an attorney to review each client's medical record on the EHR on which it resides, there are times when the facts of a case indicate that additional information may exist. In such situations, it is advisable to engage an EHR consultant to assist in determining the type of information that may not be visible on the main screen and to actually go to the facility and analyze the patient's EHR file. The EHR consultant knows what to look for.

CONCLUSION

EHRs held out the promise of faster, better, and more coordinated healthcare and, on this promise, became a regulatory requirement for healthcare providers. Unfortunately, theory and practice are not the same. The problems with paper medical records have been changed into new and different problems with EHRs. Data overload, errors in data entry, and design and usability issues make the EHR susceptible to inaccuracies and challenge. The goal of EHRs is to allow better clinical outcomes, improved population health, increased transparency and better efficiency in healthcare. The reality is that accuracy of EHRs is dependent on its clinical users. Until we find the right balance between the human and the technical component of EHRs, dissatisfaction with them will continue.

REFERENCES

Bell J., Doctors Not Using Electronic Medical Records Faced With Payment Cuts (http://www.wallstreetotc.com/doctors-not-using-electronic-medical-records-faced-with-payment-cuts/213502/) Retrieved 3/3/2015

Centers for Medicare and Medicaid Services, Payment Adjustments & Hardship Exceptions Tipsheet for Eligible Professionals (August 2014) http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/Downloads/PaymentAdj_HardshipExcepTipSheetforEP.pdf Retrieved 3/3/2015

Chesanow N, 8 Malpractice Dangers in Your EHR. Medscape Business of Medicine http://www.medscape.com/viewarticle/828403 (Aug 26, 2014) Retried 3/5/2015

Drury B, Gelzer R, Trites P, Electronic Health Records Systems: Testing the Limits of Digital Records Reliability and Trust. Ave Maria Law Rev. Vol. 12:2 pp.257-289 (2014)

Meaningful Use. Centers for Disease Control and Prevention. http://www.cdc.gov/ehrmeaningfuluse/introduction.html (2014) Retrieved 3/3/2015

Ong, K. (2011). Medical Informatics An Executive Primer Second Edition, Healthcare Information and Management Systems Society (HIMSS). Chicago

O'Rourke KM, EHRs Not Living Up to the Hype. Medscape Oncology http://www.medscape.com/viewarticle/833224 (Oct. 20, 2014) Retrieved 3/3/2015

Pullen LC, Human Error Seeps into Electronic Medical Records. Medscape Medical News Conference News http://www.medscape.com/viewarticle/834566 (Nov. 4, 2014) Retrieved 3/3/2015

Stage 2 Meaningful Use Fact Sheet. Centers for Disease Control and Prevention. http://www.cdc.gov/phin/library/PHIN_Fact_Sheets/Stage%202%20Fact%20Sheet-09_03_2013.pdf (2012) Retrieved 3/3/2015

Terry K, EHRs Not Reliable for Legal Cases, Experts Say. Medscape Medical News, http://www.medscape.com/viewarticle/832822 (Oct. 3, 2014) Retrieved 3/3/2015 🐾

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Audit Logs

Scott Greene, CEO, Evidence Solutions, Inc.

Keywords: EHR, EMR, chart audit, audit logs, audit trail, data breach, health records

Audit logs and metadata are key to proving when changes were made in a patient's chart. This article will discuss data breaches, audit logs, their requirements, nature, and security in the healthcare industry. This will also discuss how to ask for records, how to recognize the ease by which records can be altered.

AUDIT LOGS: THE REQUIREMENTS FOR PATIENT PRIVACY

In addition to the meaningful use audit log requirements, the HIPAA Security Rule, HITECH Act, and the Joint Commission each have specific requirements pertaining to audit logs and patient privacy.

The Office of the National Coordinator's 2014 Health Information Technology Certification programs mandate that electronic health records (EHR) technology meet certain audit log requirements. Changes and actions to the patient record must be captured, including dates and times of the actions, user identification, and ID of the patient record being accessed.

WHAT DOES ELECTRONIC AUDIT TRAIL MEAN?

An electronic audit trail in the context of electronic medical records (EMR) is used for the following reasons:

Security Knowing the identity and, usually, the location of the person who viewed the record (generally an IP address).

Laws are firmly in place to guide healthcare administrators and staff on ethics surrounding medical records and patient confidentiality, including use of audit logs and audit trails. Failure to follow the rules can result in hefty penalties, including jail time. Electronic audit trails for EMR access points should be designed to ensure confidentiality, compliance, and authentication.

Medical billing Ensuring accurate billing, including the proper charge for services or procedures.

Medical bills were computerized long before medical records were. But with integration, comes automation. When an electronic progress notes, surgical notes or discharge treatment notes is entered into these systems along with the pre-determined diagnosis code, the procedure code is automatically sent to the billing department.

Data gathering Obtaining data for public health reporting and medical research.

Health care organizations are sometimes required by state and federal public health agencies to gather data to help diagnose, track, and remediate disease outbreaks. Reporting time for this type of information is usually quite short. Electronic audit trails can also be utilized for medical research purposes, e.g., to help discover the etiology of a possible medication reaction.

SO YOU WANT AN AUDIT LOG. WHAT DO YOU NEED TO ASK FOR?

Typically law firms ask us for an "audit log" or an "audit trail" by patient or medical record number (MRN) for a given time frame. On occasion, we will see the time frame requested as "all," which is intended to net the patient's entire log while in the care of that organization.

However, it is usually more productive to ask for specific information, allowing for an "including but not limited to" disclaimer. Each EMR system is different and can hold different information. If we know which EMR system is in use, we can typically generate a list of the fields that we want.

WHAT'S IN AN AUDIT LOG?

Time stamp The time stamp is a critical piece of the EMR audit. It indcates the date and time that something occurred

in the record. Each change to a patient's record should have a single line with a date and time to show its creation and any additions and/or changes. A typical time stamp looks like this: "11/20/2011 16:42:05 EST." It is important to adjust the date and time if the date and time stamp is related to another time zone. In this case the time zone for this entry is "EST" or Eastern Standard Time. If the facility where the entry occurred is in another time zone, then an adjustment will need to occur to determine the local time.

Facility This generally refers to the facility or department where the patient is being treated when the entry is made. It can be an abbreviation for a facility such as a hospital or it can be a department within a given facility. For example, a sample facility field may contain "GH." The EMR system likely has another reference table or list that can translate "GH" to "General Hospital."

Nursing Unit Typically this is facility-specific. It may be a department within the facility if the EMR system uses the Facility field as a location, e.g., "EMRM." As with the Facility field, you will probably need a reference table or list to translate this entry from a code to a recognizable location.

User, User Name, Person, Personnel Name, etc. This is most likely the user who is making the entry. These fields are usually populated with either the person's login ID, e.g., "jdoe," or name, e.g., "John Doe" or JDoeRN."

However, these fields may also contain something non-obvious like, "System," "Imaging Server," or "Chart Server." Typically this indicates some sort of automated access to the medical record to add or create information. This occurs when a larger facility uses different computer systems in different areas (e.g., laboratory, pharmacy, central supply), and these disparate systems communicate with each other. This

gives the log reviewer a clue as to where the data originated.

Role This field has to do with security permissions, indicating a group of users with particular access rights to each medical record. When this field is filled in with "Physician," for example, the person who logs in to this session has the access and entry permissions assigned to the "Physician" role. Typically, a physician can see everything in the patient's medical record. A user whose role is "Radiology Technologist," however, may only be able to see information about the patient's radiology images and results. A given organization's roles can be different from another organization's roles.

Device, Device Name, Server These fields refer to the computer or device used to access the record. Normally there are two: One contains an ID for the device that the user is actually using to view or enter into the medical record, e.g., a terminal on a floor, a handheld device, or a remote access. The second field indicates which computer system inside the organization's Information Technology department is being accessed by the device listed in the first field.

Application, Module, Sub-System This field generally holds information about which module or subsystem of the EMR system the caregiver is using to enter information. These fields can contain broad entries such as "Microbiology" or "Radiology," or they may be more descriptive such as: "Microbiology: Result Entry" or "Diagnostic Imaging: Transcription."

Event, Event Name, Event Type, Task These fields are usually abbreviations or codes that relate to the screens that the user is using to view or make entries into the medical record: Examples include: "View Encounter: Open Chart," and "Lab Inquiry: View Results."

WHAT IS THE USE OF AN AUDIT LOG IN LITIGATION?

Audit logs can help bolster either plaintiff or defense claims about whether procedures were performed at the times that the clinician states they were performed. In addition, audit logs can sometimes show if someone who was involved with the patient's care accessed, altered, or modified data when or where they shouldn't have.

Example: Alteration

In November 2011, a bacteriological culture was done a technician in the hospital laboratory as requested by the hospital Emergency Room physician. Preliminary results delivered to the Emergency Room were given as "not conclusive" in the record, and did not indicate that the patient had Group A Streptococci. Neither did several printouts of screens and the chart include any mention of the Group A Strep. The patient outcome was not favorable, and

Data, including audit logs, can be changed. A printout of the medical record along with audit log won't show that data had been manipulated.

in 2013, an action was brought alleging failure to diagnose this infection.

Although the initial audit of the patient's record was originally limited to the 2011 time frame, a later audit log indicated a change had been made to the "Bacteriological Results" field in 2013. The audit log and the investigation into the data were expanded. Metadata in the audit log and in the EMR system disclosed the exact date and time when the lab clinician (who was identifiable) changed the information in 2013.

AUDIT LOGS ARE EDITABLE? SAY IT ISN'T SO!

Many experts declare that an audit trail represents everything that happens with a medical record. Some will swear that audit logs cannot be changed. The truth is that in many cases audit logs can be manipulated and altered. This manipulation and alteration, then leads to the conclusion that the audit log may not fully represent everything that has happened with a medical record.

In December 2013, the Department of Health and Human Services' Inspector General's office surveyed almost 900 hospitals. The survey, which had a 95% response rate, found 44% of the hospitals who answered reported having the ability to delete their audit logs. Another 33% could disable the audit logs, while 11% could edit them at will.

Our forensic experts believe that the percentages could actually be much higher.

The reason is relatively simple: Audit logs are data. Data can be created, manipulated, or changed. If the same changes are made to both the patient's medical record and to the audit log(s) who would be the wiser? A printout of the medical record along with audit log won't show that data had been manipulated.

HEALTH DATA SYSTEM BREACHES

With significant data breaches in the last year, securing EMR data is critical. These data breaches were recently discovered:

- St. Joseph Health System, Suwanee, GA

  Names, dates of birth, Social Security numbers, and addresses of approximately 405,000 people at risk.

- Montana Health Department, Helena, MT

  Names, addresses, dates of birth, Social Security numbers, bank account information, and clinical information from a 1.3 million-person database.

- Anthem Health Insurance, Indianapolis, IN

  Names, addresses, dates of birth, Social Security numbers, email, salary and employment information from approximately 80,000,000 accounts.

- Premera Blue Cross, Mountlake Terrace, WA

  Unknown (at this time) but thought to include: names, dates of birth, Social Security numbers, addresses, e-mail addresses, phone numbers, identification numbers, bank account or payment information, and claims information, including clinical information from approximately 11,000,000 accounts.

EMRs should be protected and secure. It is imperative to protect EMRs from unauthorized outside access and reliable data trails are necessary in order to make sure that only employees and contractors who have a "need to know" can access them. HIPAA specifically requires that only authorized users have access to medical records.

However due to their online status and our hyper-connected society, EMR systems are exposed to the Internet. This makes these systems vulnerable to hackers.

Health care leaders need to be more diligent than they have been in terms of security. While external attacks are becoming more common, other threats include lost or stolen laptops and unauthorized access to EMR records. The

health care industry needs to defend against sophisticated cybercriminals who seek critical medical data to commit fraud or turn a profit.

HACKS AND DATA BREACHES DON'T COME JUST FROM THE OUTSIDE

Kayne West and Kim Kardashian had their baby in the Cedars-Sinai Hospital in Los Angeles, CA. on June 24, 2013. Between June 18 and June 24, 2013 Kim Kardashian's medical records were inappropriately accessed. The hospital fired five individuals who accessed Kardashian's medical records outside of their scope of employment. In addition to the five fired for accessing her records, a sixth person was fired for accessing the records of 14 other patients in that same time period.

In October of 2013, the Allina Health System in Minnesota notified approximately 3,800 patients that one of its clinic medical assistants had improperly accessing their protected health information (PHI) over approximately three years between February 2010 and September 2013. The record system, which covers all of the Allina Health System, allowed the employee to access not only records at the clinic location, but also records from other locations within the organization. The employee in this case, accessed patients names, dates of birth, clinical health data, health insurance coverage information, and partial Social Security numbers. "We deeply regret that this occurred and want you to know we are committed to protecting the privacy of our patients' personal information," the Allina website said. "To help prevent similar incidents from happening in the future, we are evaluating our policies related to protecting patient information, examining our computer security programs and continuing to educate employees on their obligation to maintain the privacy of patient information."

Medical records can contain names, Social Security numbers, eligibility information and insurance identification numbers that could be used to access care, and credit card and banking information.

WHY ARE MEDICAL RECORDS SO VALUABLE?

While each hack and data breach is unique, personally identifiable information (PII) may be divulged. This may include bank accounts, credit card accounts, and online buying accounts. In other cases, hackers only end up with email addresses and passwords. EMR and EHR data breaches appear to have the highest value to hackers. While values vary, several sources we found indicate the following:

+ Social Security numbers from $0.25 to $3 each
+ Credit card numbers from $2 to $9 each
+ Identities from $5 to $10 each
+ Electronic medical records from $10 to $1000 each

Not only do medical records contain PII such as name, address, and Social Security number, they also contain eligibility information and health insurance identification numbers which could allow someone to receive free medical care, including surgery. They may also contain credit card and banking information.

Further, since children's EMR records are included with adults', children's records are particularly valuable to cybercriminals because their lack of a credit report and bank account makes it difficult to monitor them for identity theft. It is possible for a child's identity to be exploited for years before the fraud is uncovered.

According to a report published by AllClear ID, the percentage of identity theft doubled between 2011 and 2012 data for children 5 and under. The company says: "10.7% of the children scanned from our data were victims of identity theft. This is 35 times greater than the rate of identity theft seen in adults in the same population."

SUMMARY

Requesting and reading audit trails and logs is a specialty. If something just isn't adding up, consider consulting a computer forensics expert with experience in EHR to be sure you are getting a clear picture.

RESOURCES

Meaningful use audit logs: http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/downloads/Stage2_EPCore_9_ProtectElectronicHealthInfo.pdf

HIPAA Security Rule: www.hhs.gov/ocr/privacy/hipaa/understanding/srsummary.html

HITECH Act Rule http://www.hhs.gov/ocr/privacy/hipaa/administrative/enforcementrule/hitechenforcementifr.html

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Follow the Audit Trail

May 2014 - Jennifer Keel

Every activity and entry in a patient's medical records. These online logs can provide crucial evidence in your client's medical malpractice case if you know how to obtain and use them.

Every time a user views, edits, prints, deletes, downloads, exports, or otherwise manipulates any part of a patient's electronic medical record (EMR), the system makes a contemporaneous record of that activity as it occurs. This audit trail provides direct evidence of exactly what was done — when, where, and by whom — to a patient's EMR.

Another way to think about the audit trail is metadata about the patient's chart itself. Consider an ordinary document on your computer. With a few clicks, you can view its properties — that information is metadata about the document. If you open the document, even without making changes, the metadata will change. Similarly, the audit trail is the metadata for a patient's chart that changes every time the chart is accessed or altered.

The use of EMRs has been on the rise since 2004, when President George W. Bush launched an initiative to computerize health records.[1] This progression advanced exponentially when the Centers for Medicare and Medicaid Services offered incentive payments to clinicians and hospitals when they used electronic records to achieve improvements in patient care.[2] Along with this increasing use came more concerns about privacy and security. Despite these concerns, audit trails have become an integral part of the medical system and medical malpractice litigation. They are an important tool at your disposal, but first you must know how to obtain them and use them to your client's advantage.

HIPAA set the national standard for maintaining patients' medical information, including electronic data. One of its purposes was to ensure that medical records could not be altered without detection, to "protect the security and privacy of individually identifiable health information,"[3] but the statute alone was insufficient to fully address the expanding range of issues inherent in the transition to completely electronic systems. In 2003, the HIPAA Security Rule was passed. It requires regular monitoring of system activity, including audit logs and access reports, by IT personnel or compliance officers on a quarterly basis (if not more frequently), as well as the implementation of hardware, software, and procedural mechanisms to record and examine system activity.[4]

The documentation systems other departments use may not show up on an audit inquiry of the main clinical documentation system.

In 2009, the Health Information Technology for Economic and Clinical Health (HITECH) Act was passed to promote meaningful use of health care technology.[5] Unlike older laws, which were written with paper records in mind, newer laws contain provisions addressing technological advances in health information. The HITECH Act specifies that EMR systems must satisfy certain requirements, such as recording access to patient records, showing who viewed or changed information, when this was done, and from what location. Together, these statutes provide a legal framework that requires organizations using EMRs to track and maintain a log of all access to electronic records.[6]

EVIDENTIARY CLUES

What can you learn from an audit trail to help your client? The possibilities abound. Suppose your client was discharged from the emergency room without discharge instructions, a key issue in your case. Many months into litigation, a copy of discharge instructions appears for the first time. The hospital tells you that it existed all along and was inadvertently omitted from every certified copy of the chart previously produced. In the past, you had little choice but to take the hospital's word

for it, but today you can check the audit trail. It may reveal conclusively that no one printed discharge instructions for your client before she left the hospital, but that after suit was filed, someone accessed the chart and printed the instructions, just days before they were disclosed to you.[7]

We have all taken depositions where providers claim to have a clear recollection — years later — that they made key entries contemporaneously and were at your client's bedside during every important event in his or her care. Don't believe them? Get the audit trails showing which computer terminals they used to enter information and when. You may learn that all the entries were made hours later, and that a nurse was in another patient's room entering information into someone else's chart when he or she claims to have been with your client. In fact, audit trails can be run to show a certain care provider's activity and do not have to be confined to a particular patient. This might be done to demonstrate, for example, patterns of documentation failures or suspicious narcotics handling by a particular nurse.[8]

If you want to know whether the nurse who claims to have charted contempo-

1. George W. Bush, Address, President Bush Discusses Quality, Affordable Health Care (White House, Washington, D.C. Jan. 28, 2004), www.georgewbush-whitehouse.archives.gov/news/releases/2004/01/20040128-2.html.
2. 42 C.F.R. §495.2—Standards for the Electronic Health Record Technology Incentive Program.
3. Smith v. Am. Home Prods. Corp. Wyeth-Ayerst Pharm., 855 A.2d 608, 611 (N.J. Super. L. Div. 2003); see also R.K. v. St. Mary's Med. Ctr., Inc., 735 S.E.2d 715, 720 (W. Va. 2012), cert. denied, 133 S. Ct. 1738 (2013).
4. 45 C.F.R. §§160, 162, 164 (2014); 45 C.F.R. §164.308(a)(1)(ii)(c); 45 C.F.R. §164.312(b).
5. 42 U.S.C. §300jj (2014), §17901 (2014).
6. See e.g. 42 U.S.C. §1320d (2014); see also 45 C.F.R. §§160, 164, 170.
7. See e.g. Pl.'s Mot. to Compel Prod. of Audit Trail Docs. at 8, Hand v. Girard, 2012 CV 353, (Colo. Arapahoe Co. Dist., July 19, 2013.)
8. Nimoh v. Allina Health Sys., 2011 WL 4008313 (Minn. App. Sept. 12, 2011).

raneously at the terminal in your client's room was telling the truth, focus the audit request on that nurse without limiting it to your client. In that instance, you might ask for the audit records that show every time that nurse accessed the system from any terminal during a certain period. Defense counsel will balk at this and claim that your request violates other patients' HIPAA rights, but the audit records can be pulled without patient identifiers if the query specifies that, or they can simply redact the confidential information.[9]

You might discover that someone accessed or altered your client's records for inappropriate reasons, and reviewing audit records can reveal such activity.[10] Or, you may discover that people whose names do not appear in the medical record or were not disclosed as witnesses accessed the chart and had a role in providing care. They may be unit clerks responsible for clerical duties, nurses assigned to other patients who stepped in to lend a hand, or technicians in other departments, such as radiology. Hospital employees may have made entries in sections of your client's chart that were never produced to you, such as a telephone log or radiology records system. A detailed timeline will begin to unfold in your client's audit trail — as well as an inventory of witnesses and documents — that is not apparent from the medical records alone.

AUDIT TRAIL PRODUCTION

Request the audit records you want in discovery, but be prepared to file motions to obtain the information. Defense counsel may deny that it exists, argue that they cannot access it, that it is irrelevant, or that you're not entitled to it. I have not yet encountered a claim of privilege in response to an audit trail request, but that too may be inevitable. None of these objections holds up under close scrutiny.[11]

Know what you are seeking, and tailor your requests. Audit trail records are obtained by querying a database with various search terms—such as information identifying a patient, a provider, a location in the hospital, a particular EMR system, a date or time span, and a specific visit. The fewer parameters entered, the wider the inquiry will be. For example, your client's name and date of birth may produce a large pool of information, but adding a date of care would narrow the results. Specificity in your search terms is likely to increase your chances of success.

Before making any discovery requests, obtain a copy of the hospital's policy manuals to improve the odds of receiving the audit records. These manuals contain policies that specifically address data security and auditing capabilities within the EMR systems. Often, these policy manuals also contain additional data about how the facility is organized and what information is available. Armed with this knowledge, you can tailor the language in your discovery requests. It will be far more difficult for your opponent to claim they do not understand your requests when you can refer them to their own internal policies.

Once you receive the audit trail documents, be skeptical. Although federal law prohibits editing the audit trail records in the EMR system,[12] the information can be altered once it is exported to a spreadsheet. Key items might be deleted or changed before the document is produced in discovery. Insist on the unedited, original electronic format of the document, and have a forensic expert examine it to ensure no one tampered with it. Do not accept other formats, such as a PDF document.

Be wary of audit trail records that omit evidence of EMR access at the time the audit report is run and/or after the patient was discharged.

For example, suppose your client was discharged from the hospital on Dec. 1, 2012, and you request a copy of the patient's records for that visit today. The audit trail should show that the records were accessed, viewed, and printed shortly after your request to be produced. It should also contain other entries concerning billing, doctors' post-release notes, and other housekeeping matters. If the audit trail simply ends at the time your client was discharged, you know that something is missing.

Also question audit records that lack evidence of any EMR access from the lab, radiology, pharmacy, or other departments within a hospital. Many of the EMR platforms are "closed systems," which means they cannot be integrated with other systems in the hospital. The documentation systems other departments use may not show up on an audit inquiry of the main clinical documentation system. Each database that is not directly connected to the main clinical charting system must be queried as part of a records search.

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9. Courts may order other patients' identifying information be redacted. See Or. re Pl.'s Mot. to Compel Cir. at 3, Ruchotzke v. Roberts, 13-L-78 (Ill. Peoria Co. Cir., Jan. 22, 2014).

10. See Bryant v. Jackson, 2013 WL 5529322 (Mass., Suffolk Co. Super. Sept. 17, 2013); Yath v. Fairview Clinics, N. P., 767 N.W.2d 34, 38, (Minn. App. 2009).

11. See e.g. Pl.'s Mot. to Compel Prod. of Audit Trail Docs. & Def. Resp. to Mot. to Compel (Aug. 9, 2013), Hand, 2012 CV 353; see also Pl.'s Mot. to Compel (Nov. 27, 2013), & Def. Resp. to Mot. to Compel (Jan. 17, 2014), Ruchotzke, 13-L-78.

12. See 45 C.F.R. §170.302(s)(3) (2014) (regarding integrity of audit logs).

DEPOSITIONS

Once you have the documents, you may find that the complexion of your case changes. If you have witnesses who have already been deposed, go back and compare their answers to the evidence in the audit trails. Use those discrepancies to your advantage when deposing future witnesses. If you can obtain the documents before deposing anyone, you have the option of either cornering a witness with the information in the audit trail or letting him or her advance unaware through your questions to his or her detriment. In either case, it is often surprising how many providers forget that their activity is monitored in the EMR. They will assert their clear recollection of a story that serves their interests in almost every case, without regard to whether your next line of questions may trap them in a lie.

OVERCOMING OBJECTIONS

You will encounter objections when requesting audit trail records, and a few of the most common are discussed here.

The audit trail is too burdensome to collect or produce. This is by far the first and loudest objection, and it is simply untrue — audit trail information is easy to collect and produce. Hospitals employ highly trained IT staff, including database administrators and technicians, whose principal job is managing the hospital's databases and running queries against them. Producing audit trail reports is an ordinary function of this job. While the defense will try to portray your request as unique and bizarre and one that they have little hope of being able to comply with, you are not the first person to demand production of audit trails during litigation.

Facilities using EMRs must keep these logs and provide access to them as required by law (and must demonstrate compliance with these statutes to maintain their federal accreditation), so there is already a maintenance and retrieval process in place for audit trails — which is described in the policy manuals. In short, defendants know what you're asking for and how to provide it. They may need to do it for Medicare or Medicaid, for internal purposes, in response to concerns or complaints about HIPAA violations, or for various other reasons.

Defense counsel may argue that such a request is unduly burdensome for their client, but audit trail production is a simple database query usually done by IT staff, and it does not take clinicians away from their patient care responsibilities. Someone types in the search terms and sets the search engine to work. The completed report is exported into a format for use — usually a spreadsheet. Your requests should always be for the unaltered, native electronic format of the audit trail (not a printout). And, because the files are electronic, there is no burden of printing a voluminous record.

The audit trail is not part of the medical record. To the contrary. Because the audit trail is metadata about the medical record, it is undeniably part of the record. In fact, it cannot be separated from the EMR, because every time someone accesses the record, a corresponding entry in the database is generated, tracking access. This data is an integral part of the record and provides direct evidence about the care your client received from the facility and the individual medical providers. Although the audit trail will not provide medical assessments, such as the patient's vital signs, it will tell you who charted these observations; whether they were changed; and who viewed the information subsequent to its entry, printed it, or deleted it, and when. This data is a more accurate record about the care that was rendered than the chart alone.

The audit trail is irrelevant. You can show how this evidence is pertinent to your case in numerous ways. At a minimum, it can give you a list of every person whose credentials were used to access the chart, which will reveal potential witnesses who were not apparent from the records themselves.

The audit trail is the only objective account of when your client's data was viewed and charted. The timing of when providers looked at test results or made entries often becomes a critical issue. Just as the EMR provides a more accurate account of what happened with the patient at the time in question than recollections years later during litigation, the audit trail gives a more precise snapshot of who manipulated the record, wwhen, and for what purpose. If you cannot locate a provider, that provider's audit trail may be the only reliable "testimony" you can obtain.

Because providers cannot document every detail associated with patient care, the audit trail often fills in gaps about undocumented occurrences: when your client's discharge instructions were printed, when the doctor viewed test results, or whether he or she did so from home or at the patient's bedside. Of all the hurdles you may face in obtaining an audit trail, the relevance objection should be the easiest to overcome.

Discovery of audit trails is a relatively new and underused tool for plaintiff lawyers. In the future, audit trails may be routinely provided as part of a medical records request, but you need to know how to obtain them now. The effort will pay off in developing cases for trial. ❧

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Documented — But Not Done

Katy Jones, MSN, RN, LNC

As nurses, we've all learned the phrase: "**Not documented, not done.**" The phrase implies that if the caregiver didn't document all aspects of care, the care wasn't performed. This phrase has been a boon to plaintiffs until recently. But I'm now seeing plaintiffs file lawsuits claiming that documentation **was** done, but the care wasn't actually performed. There's a **simple reason for this change in approach** by plaintiffs. And there are some **big implications** for expert, in-house, and independent legal nurse consultants.

The **simple reason for the change** is electronic medical records. What I'm now seeing is that good documentation can still lead to lawsuits. That's because many of these records use time savers, such as **auto-populating fields**. For example, a review of systems related to a patient's gastrointestinal history might auto-populate as the following:

> *Denies appetite changes, weight changes, dysphagia, nausea, vomiting, hematemesis, bright red blood per rectum, melena, abdominal pain, colic, icterus, diarrhea, constipation, change in bowels, tenesmus, hemorrhoids, rectal pain, hernia.*

If the patient has any of the signs or symptoms listed above, the caregiver identifies the words that describe the patient's GI history. As a legal nurse consultant, you'll recognize those words because they will be in a bold font, have a blackened circle in front of them, or otherwise stand out from the other terms.

If the patient has none of the listed signs and symptoms, the caregiver doesn't have to chart anything with some types of electronic record systems. When reviewing the medical records, the LNC will see that the patient denied having any of the listed GI problems.

However, I'm now seeing lawsuits in which **plaintiffs claim that caregivers never asked the questions** listed in the self-populated fields. In essence, we now have situations in which care has been documented but not done.

How will plaintiffs prove that the care wasn't done? They'll do it the same way that defendants prove that they actually performed care that wasn't documented: by verbal testimony.

Independent and in-house LNCs who work with plaintiff firms often meet with potential clients and then correlate their allegations to the medical records. Until recently, if documentation in medical records didn't support a patient's allegations, attorneys would often forgo filing a lawsuit on the patient's behalf. However, with electronic medical records, LNCs need to take an additional step, by trying to determine if the records themselves might be inaccurate.

For example, consider the following two scenarios. **In the first scenario**, a patient visits his primary care provider (PCP) whose electronic medical record system has self-populating fields. In the GI section of the history, the PCP's records show that the patient denied GI signs and symptoms. However, the next day,

If documentation didn't support a patient's allegations, attorneys would decline a case. Now, with electronic medical records, LNCs must take an additional step: determine if the records themselves might be inaccurate.

inaccurate documentation because of the two-week time lapse between the two visits. **Identifying inconsistencies between the records and the patient**, then reporting those inconsistencies to the attorney are important actions for the LNC to take.

Experts for plaintiffs need to be careful when using patient statements as part of their opinions, unless the statements are part of sworn testimony. Several of the attorneys in the defense firm where I work will challenge expert pre-suit affidavits based on unsworn

I visited Dr. X on February 18, 2015, I complained of pain in the lower left side of my abdomen." The expert's affidavit would then include a statement such as, "According to the affidavit of patient John Smith, he complained of pain in his lower left side when he visited Dr. X on February 18. 2015."

For years, I've said that **verbal testimony carries the same weight as written documentation**, at least in the eyes of the law. I think we're going to see more and more lawsuits that are based on inconsistencies between plaintiff statements and electronic documentation of care. In other words, we're going to see more lawsuits based on cases that were **documented but not done.** ❧

We can expect to see more lawsuits that are based on inconsistencies between plaintiff statements and electronic documentation of care.

the patient visits the emergency room where the physician eventually diagnoses a ruptured diverticulum. In this scenario, there's a chance that the PCP's **electronic documentation is inaccurate** because of the closeness of time between the two visits.

The second scenario has the same set of circumstances, except that the patient visits the ER two weeks later instead of the next day. In the second scenario, it would be more difficult to allege

plaintiff statements. For example, they have challenged expert affidavits that have used statements such as, "**According to information provided by the staff of the law firm**, the patient complained of left lower quadrant pain when he visited Dr. X on February 18, 2015." The defense attorneys that I work with HAVE accepted expert affidavits that are accompanied by an affidavit from the plaintiff. **Affidavits, which are sworn statements**, might be worded as, "When

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Roundtable Discussion on Electronic Health Records

Curated by Cheryl Gatti, BSN, RN, LNCC, CCRN-R

LNCs are reviewing more Electronic Health Records (EHRs). To create a dialogue regarding issues specific to our practice, we posted five questions focused on the EHR on the AALNC website asking members to identify problems they have encountered. These are representative of the many thoughtful and thought-provoking comments from 138 members who replied.

JLNC: What has been your experience reviewing EHR versus paper records?

Most of the respondents continue to work with both paper and the EHR, with the obvious trend towards the EHR. The most common issues with paper/handwritten records were illegibility and difficulty identifying healthcare providers with handwritten entries. Respondents cited large number of pages, repetitive information, and disjointed records as EHR problems. Many thought that the paper record offered a more detailed description of the patient's condition, but as one put it, EHR is "data-rich and information-poor."

"Although every facility uses a different type of EHR, it's usually easier to locate information in electronic records versus paper records. However, EHRs generally don't include full nursing notes. I have found out a lot of valuable information in the handwritten nursing notes."

"I work for a defense firm, and I read many records. Nearly all of our clients utilize EHR now and we have seen several brands of EHR from various vendors. I HATE ALL OF THEM."

"It is much more difficult to find information in some types of EMRs. Information is not as logically placed as in a paper record. Items that would normally be on the same page are hidden throughout the record and are not easily retrievable except by an expert on that particular type of EHR."

"EHR are more costly to the client (because they) are generally not organized to expedite review or prepare an expert report, if necessary."

"I often see many pages of data that are detached from each other. For example, dozens of pages of systolic BPs, followed some inches later by the corresponding diastolics, and maybe later by pages of means. Where are the vasoactive meds? The labs? The blood gases or ICPs? Physician and nursing notes? They're somewhere in that pile (maybe). How do I look at this mess to see a patient's condition evolve over time? I do, but it takes a long time. This costs the client money."

"EHR is clear and concise when it relates to orders. However, abstracting data for meeting regulation requirements can be difficult."

"Very frustrating. The order in which the records come does not make much sense…I have also located the same thing (say, I & O) done in two different sections, not sure why. Some sections come in chronological order, others are in reverse order."

"Actually easier to review EHR. I can store it on a computer, find and print what I want, and reduce paper load."

"Some positive, more negative. On the positive side, it's easier to identify the healthcare providers, particularly the nurses, who were involved in the patient's care."

specialty area documentation…EMR is key for reimbursement, but not to truly document both subjective and objective findings."

"At first I thought it was really good (at my hospital). Unfortunately, I have developed bilateral nerve injuries in my arms because of all the keyboarding."

"In simple terms? Electronic documentation sucks."

JLNC: What have you found to be the most difficult aspect of reviewing the EHR?

"All the systems have different nuances: for example, Meditech labels a report one thing, but it's called something else in EPIC or Cerner." "There are too many vendors resulting in a variety of formats. You have to know the way the EHR is organized from each provider before you can review content."

"With CPOE (computerized physician order entry), some doctors document on incorrect sections. For example, they'll use 'Other Physician Note' to document the patient's H&P, Progress Note, Discharge Summary, etc."

"The paging back-and-forth to look at different parts of the record becomes ver cumbersome."

"Paper records are much easier in terms of establishing chronology. The print-out of electronic records are presented according to topic area, not chronologically, and are much more time-consuming to review."

"System glitches. Documentation is unclear when handoff took place in ED harboring while waiting for a bed. ER physician documents handoff to hospitalist, while nursing is still documenting in ED EHR."

"…One day's nurses' notes may be 100 pages."

"The most difficult aspect would be the sheer volume. The information was repetitive, but that needed to be confirmed as well as information that was pertinent to the allegations was scattered…There seem to be very little opportunity for a free narrative, so (finding and reading) multiple brief comments made it even more time consuming to create that clear clinical picture."

"Progress notes are often repetitive, repeating the same information in each day's note. It can be very difficult to discern new information."

"Pages & pages of repetitive information making a change in the norm difficult to find, sort of like needle in a haystack."

"Elements of a previous visit may be brought forward but not actually reviewed by the provider. Billing a higher level of service based on documentation (instead of medical necessity and the chief complaint) can be a problem."

"With scanned documents, security is an issue because online reading within a secure server is still relatively slow — I end up downloading the documents in order to review them quickly and to enable certain features such as magnification and document orientation settings. Then I have to have encryption software to protect

"*Copy-and-paste results in such inaccurate documentation. This feature has come back to haunt healthcare providers when records have been reviewed following the patient's discharge.*"

"It varies significantly between systems. Some are fairly easy to navigate. Others are a virtual nightmare (no pun intended) to try to find information.

"Enormous paper dump; mostly not important to case, unless it's ED or

"I sometimes refer to them as "exploded" records, since what happened to the patient is scattered widely in different categories."

"Having to look at one page for one thing and another for another thing, and separate days being on separate pages."

PHI under HIPAA, which is a good idea anyway for other reasons, but this makes it even more important."

JLNC: What do you think about CPF (the copy-and paste feature)?

"The Joint Commission has received reports to the Sentinel Events database noting documentation errors and other problems with the integrity of the clinical record. Several sentinel events leading to patient harm reported the CPF as the specific root cause." (TJC, 2015).

"CPF is MOST problematic in that it is not only very popular (therefore frequently used) but that it results in such inaccurate documentation. This feature has come back to haunt healthcare providers when records have been reviewed following the patient's discharge."

"Duplication of information…often it appears information has been cut and pasted multiple times to save time and it may be very difficult to determine what is new information, particularly with office visits."

"It's clear that end-users are using copy/ paste functionality during their documentation." "Canned" or cut and pasted statements overused and fail to reflect progressive changes in a patient's health status."

"Providers' BAD practice of cutting/ copying and pasting, and then not tailoring what they've pasted to the individual patient."

"Physicians and mid-levels should not be allowed to copy and paste from another physician's H&P or progress note unless they designate that note as originating from that particular provider."

"It allows incorrect information to be entered in a patient's history or current problems, and that incorrect information continues to be pasted into multiple dates of service in the future. That incorrect information is in fact damaging to our case, and the question we always hear in cases is 'Why didn't the doctor correct

the error?' with the implication that the MD is not reading what he is signing."

"My primary care provides access to my records in a patient portal. When I noticed errors about a surgery I had, I asked them to correct it to the right procedure. They told me they couldn't do that because that procedure wasn't a choice in their system. So there it stays, and there's nothing I can do about it because there isn't a free-text option either."

JLNC: How does the screen version of the EHR differ from the printed version?

"I understand from our nurse experts that there is a big difference in what they work with on a daily basis and the final printed version we show them for depo and trial prep."

"Totally different. Live, you can pull up what you need. Hard copy EHR are all together — with all of the duplicates, and not by section (MD orders, I&O, Progress notes, etc.) order."

"I use Meditech at my clinical job. A printed Meditech record looks nothing like the screens we use to document."

"The printout does not represent the screen version — period."

"The printed version tends to group things together to make it look more like a summary. A record can be printed out a number of ways from any system. Some reports are hard to navigate, and others are easy. It really depends on the system formatting."

"I don't think any of the programmers knew that a hard copy would ever be necessary. Therefore, there is NO resemblance between the screen version and the hard copy. And for the LNC, viewing hard copies of multiple software programs is even more problematic."

"If you could actually log into the EHR it would show you how practitioners are deciding their answers in drop downs etc. (This would give you) good insight."

"The clinician has absolutely no idea how their documentation prints out and in some cases, are very surprised in deposition prep that some the 'boxes' that they are checking are printing out the way they are."

"Oh my gosh - let me count the ways! The screen version is a bunch of checklists — boxes, boxes, and more boxes. The EHR is the story of what was checked and what was filled into those boxes… Did the patient get the drug the physician prescribed? Look in one place. What is the patient's output for the last few hours?

Look in another place. Is the patient's pain controlled? Look in another place. It's like finding a needle in a haystack. And the haystack is getting bigger and bigger."

"The EMR often omits free-standing documentation, like EKG printouts or DEXA scans done in a different facility or department; I only find out about these because I look at billing. Here's a bill for an MRI! Where's the report?"

"*I have met many nurses who have no idea how to read the electronic record. The comment is usually, 'I have no idea what I am looking at, the chart doesn't look like that.'*"

"*When involved with nurses & risk management, I encourage them to ask IT or RM to print a record from their unit so they can see what they look like. Defendant medical professionals who don't recognize a printed EHR with their electronic signatures all over it? Should not happen.*"

JLNC: Have you been involved in a case where EHR system errors were a factor?

Most LNCs who responded have not been involved in an EHR system error case. It's often difficult for the LNC to know if there is system error or user error.

"*I think the integrity of the EHR is as accurate as when it is put in, or (as) the person*

inputting the data. Nevertheless, just like paper chart, there is need to be mindful of what and how data are captured."

"*Not errors as much as metadata uncovering late entries that were not apparent from the produced record.*"

"No, although there have certainly been instances where I thought that should be the case." "No, but that is serious and concerning."

"No, but I have been involved in a few cases where the records are not complete and trying to get them is like pulling teeth. For example handwritten records not placed with EMRs and any records that occur pre- or post-admit but related to admission (ambulance, ED, and transfer, etc.)."

"*Yes! 'Accepting defaults' got us a million dollar + settlement.*"

"*Yes. A physician blamed Cerner (the EHR system) that a future lab order was 'lost' in the system so it didn't get done, and then the missed lab caused a delay in cancer diagnosis. There is government regulation that basically protects the computer software companies from being directly liable…Doctor's defense was that it was the computer's fault. Research showed many docs do not adhere to mandatory education and that hospitals don't punish docs who do not comply.*"

"*YES!!! Had a 6 week old where the EHR documented 'nonsuicidal, nonhomicidal.' The MD had a hard time answering that question in deposition.*"

"*Yes, in an ortho case. All of the times that the tourniquet was applied, inflated & deflated printed as 0000, and there were clearly recognizable circulatory complications post-op.*"

"*Yes. Nurses repeatedly documented that an individual had an NG (nasogastric) tube and he never did. The first nurse who assessed the individual marked it as present, patent, etc. and every nurse afterwards marked the same information.*"

"*Yes. I had one where the vital signs were taken directly every five minutes from the cardiac monitor and these were preserved in the record. However, when the vital sign pages were printed out, there were numerous inconsistencies between these and vital signs taken and entered by the nurses. It allowed opposing counsel to confuse the nurse expert.*"

"*Yes. There is a feature in most EHRs that allows one provider to 'accept' a previous assessment or observation. It is not unusual for one nurse/provider to accept status of a patient when the LNC knows from other notes that the NG tube has fallen out, the IV is infiltrated, or the patient has gone down the drain in the interim period. It makes the provider look like he/she is lying or is an idiot in deposition.*"

JLNC: If you are clinically active, do you think the EHR hinders or facilitates good clinical practice?

Responses were split almost evenly, with a few more respondents believing that the EHR facilitated good practice. Many thought that there are features that both hinder and facilitate good practice.

"It has helped. A good system provides for checks and balances that help you complete the appropriate steps of documentation."

"EHR has decreased errors, provided safeguards and eliminated legibility issues. Date stamping and individual

password-protected login minimize fraud and prevent tampering."

"It can facilitate good clinical practice, as long as management takes advantage of things like bedside documentation and chart auditing. Of course, it depends on the system. Some are better for certain areas of the hospital. Unfortunately, many hospitals try to take the 'one size fits all' approach."

"EHR facilitated good nursing practice as there's an opportunity to be able to document completely IF one has developed SMART (specific, measurable, achievable, realistic, time-oriented) phrases that are individually focused on each patient."

"I work in a procedural area so I do not enter much data into the system…I do appreciate that the physicians input their own orders — I think this will reduce the number of errors in treatment, because we can actually read the orders."

"The EHR Best Practice Alerts are helpful reminders to physicians and nurses not just for Core Measures but because it is best for the patient."

"Can be useful as a reminder to complete tasks or to complete specific assessments according to dx. Cleaner handoff as long as all assessments were completed. Has helped to keep pace with quality reporting by eliminating re-entry."

"I retired from the VA. Our templates provided the nurses with many drop down choices for each category. This ensured that we captured standard items/issues/guidelines."

"In the most recent Long Term Care Home I have worked in, we are 95% electronic records. As a manager, I find this makes my job easier when I am following up on issues, auditing, etc." "The EHR facilitated good practice in the physician office, especially when answering patient phone calls — the entire record was easily accessible."

"The Allscripts EMR that I'm familiar with seems mostly intuitive, but there are too many places to put additional notes that often get missed."

"I was hospitalized as a surgical patient recently (at a hospital I work at!)--and the whole nursing process was reduced to a bunch of checkboxes. The nurses' goal was to get through the extensive Epic EHR screens, and what a mess it was when I was discharged. For example, there was one medication that my doctor asked me to not take for a week (fish oil) — it has significant anticoagulant properties. Yet my Epic-driven discharge instructions told me I could take it right away. If I wasn't a nurse and knew to ask my doc about it, I would have gone home and taken it."

"Yes, I definitely believe that the EHR has limited the reflection of good clinical practice. There are too many boxes that use the words 'normal' and 'abnormal.' Yet definitive facility policies and procedures and nursing standards of practice do not provide clear definitions on how when the use of these terms are acceptable (if ever) to use as part of the nurse's notes. In many hospital facilities the only clear P&P's that provide definitions of what

constitutes normal vs. abnormal are the laboratory data parameters. The point is that if nurses are not using the appropriate physical assessment descriptors to describe their patient's condition (as they should do), it leaves the nurse unprotected if the facility definitions for normal/abnormal do not exist. Why then does hospital software use these terms so freely and in some cases set the nurse up for possible future litigation?"

"Definitely hindered. It is problematic in that there are so many shortcuts and so many "clicks" that the end result is very poor communication of the care rendered and of the accurate condition of the patient. The Ebola experience in Dallas is a perfect example of healthcare providers NOT being able to find or NOT taking the time to find important documentation."

"Most of the time I feel like a data entry clerk. A majority of our documentation is meant to satisfy CMS requirements in order to drive reimbursement."

"Completely has pulled the physician/practitioner and nurse from the bedside."

"Hindered!!! We are focusing more and more time appeasing the computer instead of taking care of people! Meaningful use has caused nurses to focus on charting at the expense of patient care."

"No, I believe that EHR's hinder good clinical practice. Reason (and you hear this over and over among RNs): It takes too much time and puts focus on the records and not the patients."

"I think the EHR is now geared toward insurance reimbursement and JCAHO re-certification."

"I think that it hinders good practice because it discourages free text."

"I am not clinically active but I did teach clinical with BSN students. I find the documentation is poor. The staff check off entries but fail to write in details, such as pulses (quality, presence) prior to a leg being amputated."

"I believe that EHRs hinder good clinical practice. Reason (and you hear this over and over among RNs): It takes too much time and puts focus on the records and not the patients."

> *"Ask counsel to request the records by section and then by date — all MAR together, all MD orders together, all operative records together, etc. This is HUGE!"*

JLNC: Do you have tools/tips you have found helpful in navigating and organizing the EHR?

"I am frustrated with the process and I have spoken to attorneys and paralegals who are as frustrated. The attorney looks to me with the expectation that I can read these records and extract needed information, but it is sometimes a monumental task to extract the information."

"I ask for a printed copy along with the EHR on disk."

"I find it much more time-efficient to review records in print vs. on the computer. It's much quicker to leaf through & compare side-by-side paper records than to scroll through records on the computer & have to move back & forth between computer screens."

"I just finished reviewing over 13,000 pages on the computer with no index of sections of the record, DOS, etc. Sadly, what I needed to know was limited to very few pages of that record, but I had to scroll through the whole thing to locate those pages. So much irrelevant (to this case) information to scroll through! VERY time-consuming with little to show for it!"

"Ask counsel to request the records by section and then by date — all MAR together, all MD orders together, all operative records together, etc. This is HUGE!"

"I don't organize electronic medical records unless I print them out and they're unnumbered. If the pages are numbered and printed, I keep them in that order as that becomes my 'Bates stamp.' It's too difficult to try to organize EHR when they're in digital format (such as PDF) so I use a lot of bookmarks."

"I have finally surrendered to just placing them in the order in which they come and dealing with it as it just saves time and energy as well as my mental status. Just writing this out makes me feel better to get it off my chest, so thanks for asking."

"If the original EHR is page-numbered, I do not rearrange pages — eventually I seem to figure out the method to that order!"

"You need to be VERY fluent in the software that scans and extracts pages, then resorts them."

"I am a huge fan of Adobe Acrobat Pro and do everything electronically. I start by bookmarking the records and then I organize the bookmarks and then the pages…I don't organize every set of records exactly alike, but try to make them user-friendly to the attorney based on the critical issues."

"I have found I need to save the PDF on a USB drive or my desktop so I can place Bookmarks on pages, which are important for me to go back to in my analysis. After I am finished with the file, I do delete these copies."

"Learn a little bit about the system if you are not familiar with it. Some systems will vary little between hospitals, because they are sold to facilities almost entirely built out. Others are custom built for and by the hospital. These are the toughest ones to navigate."

"It's important to get metadata — the tracking of changes that were made to the EHR. The EHR is virtual and most facilities have a system for capturing the updates and changes that were made.

HIPAA requires this. But there isn't clear law in every state on whether hospitals have to produce metadata to attorneys."

"Request an audit trail when records are requested. The audit trail should provide when entries were made and by whom."

Many thanks to all who took the time to share your experiences and opinions. We will continue the dialogue on other issues pertinent to our practice. Thank you to Julianne Clifton at AALNC for compiling the data.

REFERENCES

Bowman, S. (2013). Impact of Electronic Health Record Systems on Information Integrity: Quality and Safety Implications. Perspectives in Health Information Management. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3797550/

The Joint Commission (2015). Preventing copy-and-paste errors in EHRs. Quick Safety. (10).

Retrieved from http://www.jointcommission.org/assets/1/23/Quick_Safety_Issue_10.pdf

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Looking Ahead…

AALNC
AMERICAN ASSOCIATION OF
LEGAL NURSE CONSULTANTS