

# **ELECTRONIC HEALTH RECORDS: CRITIQUE AND SOLUTIONS**

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## ELECTRONIC HEALTH RECORD CRITIQUE AND SOLUTIONS

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University of Pittsburgh, 2014

### ABSTRACT

In the realm of healthcare, physicians have traditionally documented patient records on paper. However, computers have allowed healthcare, like most other industries, to transition to storing extensive medical records electronically. The electronic health record (EHR) has been slowly adopted by health care, and it has many advantages and disadvantages compared to the traditional form of paper documentation. In general, the advantages include legibility, ease of locating the patient chart, billing, and computerized order entry. Disadvantages include over-documentation, decreased speed of physician documentation, and the cost of implementing and maintaining the EHR. Physicians find themselves spending more time documenting and less time treating and interacting with patients, which leads to physician dissatisfaction. Many interventions attempting to improve speed of documentation have been developed, including voice recognition software and the utilization of scribes. Voice recognition software is a real-time dictation system that works well in quiet environments but still requires time from the physician to dictate and proof read the dictation. Scribes have shown promise in Emergency departments and specialty clinics by being cost effective while also improving both physician and patient satisfaction. Scribes are a novel solution to facilitate medical

documentation, increasing physician efficiency, improving physician satisfaction,  
and thus important to public health.

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## **1.0 INTRODUCTION**

As health care has evolved over the decades, diagnostic equipment, medicines, and surgical capabilities have been especially innovative. However, despite these revolutionary advances, documentation and record keeping has become an aspect of healthcare that has fallen behind.[1] As the modern world began to use more sophisticated methods of computerized bookkeeping, the health care industry continued to use paper.[1] The advent of the electronic health record revolutionized the documentation process but it also brought many inconveniences.[2]

## **2.0 DOCUMENTATION**

Appropriate documentation is important for billing purposes, liability protection, disease research and surveillance, and also for the benefit of the patient's future health. [3] The most antiquated form of documentation is the free-text paper chart in which physicians would write free-hand on lined paper. The most commonly utilized documentation format of the patient encounter is the standard SOAP note. [4]

### **2.1 SOAP NOTE**

Subjective – this includes the chief complaint, relevant history as provided by the patient and past medical/surgical history.[4]

Objective – this contains the objective findings by the physician which include the vital signs, physical exam, and lab data.[4]

Assessment – The assessment is a vital part of the note because it is the physician’s conclusion or diagnosis.[4]

Plan – this is the physician’s treatment plan to address the patient’s complaint or diagnosis. This typically includes medications, surgery, radiologic imaging, or modalities such as rest or therapy.[4]

## **2.2 PAPER CHART EVOLUTION**

The handwritten version of the health record has several advantages but also several disadvantages. One advantage is the ability to customize the note. The physician is able to draw sketches, label diagrams, or depict the shape of a rash. The note can be as lengthy or as concise as the physician sees fit. Another advantage is the affordability, since electronic health record systems are typically quite costly. Disadvantages include the significant length of time it takes for the physician to free write this information as well as the potential for poor legibility of the note. [5] Hard copy records make it difficult to view the chart unless you are physically in the office and other specialties or off site physicians must request a copy, which could take days to obtain. Hard copy charts also make research more time consuming because the researcher has to manually review each chart while a computer can scan many charts quickly.



The preformatted paper chart facilitates the documentation process. This was designed to help prompt the physician to document key elements in the chart by using check boxes making it faster to complete. For example, instead of writing “Heart – regular rate and rhythm, no murmurs” one can just check a pre-typed box that says the same. These are widely used in fast paced settings such as emergency departments (ED). Disadvantages included space constraints and inability to customize the chart based on the chief complaint. [5] For instance, a patient with chest pain will prompt a different exam than a patient with an ankle injury. Thus many of the preformatted check boxes will be irrelevant to some patients with specific chief complaints. Further, the physician is given a limited space to free write the subjective, assessment, and plan which may cause the physician to revert back to blank paper. Overall the preformatted charts are helpful and have been shown to improve documentation, reimbursement, and medico-legal risk.[5]

Another commonly used documentation process is the dictated and transcribed note. Instead of free typing the note the physician dictates into a recorder that is then transcribed onto paper by a remote transcriptionist. Advantages include decreased time charting for the physician and no space constraints. Disadvantages are the cost of the transcriptionist service and turn around time for the note, which can take days. Another disadvantage is that the transcriptionist may not comprehend some of the medical vocabulary and thus the physician must appropriately edit the note before it is placed in the chart. Studies show that this produces a more complete chart, increases legibility, increases efficiency and

improves patient satisfaction. [5] The transcribed chart, however, is still a hard copy paper chart and is thus has the same disadvantages inherent to hard copy paper charts.

### **3.0 ELECTRONIC HEALTH RECORD**

The introduction of the Electronic Health Record (EHR) has revolutionized the patient encounter and even more so physician documentation. The EHR has solved many issues in health care but has also presented unforeseen problems.[2]

The EHR enables physicians or transcriptionists to type the SOAP note directly into the patient chart. Along with the EHR came computerized order entry systems (CPOE) which allows providers to order labs, x-rays and medicines through the computer.[6] CPOE has potential to reduce medical errors and improve patient safety by detecting medication interactions, dosage issues and sending allergy alerts.[6] A Boston based women's hospital reduced 55% of their adverse drug events by converting to physician order entry. [7]

#### **3.1 DISADVANTAGES OF EHR**

EHRs have many benefits in health care and patient care but, like any new technology, there are also many drawbacks. For the most part, speed and physician comfort are the major limitations to the EHR.

### 3.1.1 SPEED

A common complaint about the EHR is the added time it takes physicians to document the encounter, time which could be spent with the patient.

It has been shown that emergency department physicians spend about 25% of their time doing direct patient care while spending 31% documenting in the EHR. [8]

Studies show that using an EHR system decreases time efficiency by 8.5-17.5% when compared to paper, and if using CPOE, time efficiency decreases by 98.1% to 328.6%.[9] Of note, these studies also show that there was time saved from not having to search for and pull the paper charts.[9] Another study observing ED physicians in a community hospital in Pennsylvania found that in a 10 hour shift a physician may perform 4000 mouse clicks.[10] They found that 43% of their time was spent on data entry and 28% on direct patient care, 12% on reviewing test results and records, and 13% on discussions with colleagues.[10]

Studies on inpatient wards show similar results. A study in Austria showed 27.5% of physician time was focused on direct patient care while 26.6% was spent on documentation.[11] Thus, 25-50% of the physician's time is spent documenting or typing in the computer. Doctors feel like they are data entry clerks, and that trying to meet the meaningful use requirements takes away from "face time with the patient".[12]

### **3.1.2 COST**

Major barriers to the EMR are the high upfront cost, lost revenue during the transition period while physicians learn to use the system, and uncertain financial benefits.[13] Some physicians had a decrease in productivity for months or even years after EHR implementation.[14] EHRs can cost \$33,000 per physician up front and an additional cost of \$1,500 per physician per month to maintain the system. [13]. This cost can be prohibitive, especially considering that implementing a new EHR system can commonly result in 15% decreases in efficiency. [15] Other assessments are even worse, estimating that productivity drops between 25% and 40% with implementation and can last 6 months. [16] Therefore, many practices lose revenue due to having to schedule fewer patients to compensate for this decreased efficiency, which of course compounds the lost revenue spent on EHR implementation.

### **3.1.3 PHYSICIAN COMFORT**

EHR frequently takes time away from direct patient care, but another concern for many physicians, even after years of practice, is that they don't feel comfortable using the EHR system. [17] Physicians are opting for early retirement rather than continuing to practice medicine.[16]

This can lead to significant dissatisfaction in the workplace. A survey of Austrian physicians showed that 82% are stressed mainly due to the heavy documentation and administrative burden. [11] Further, a Research and Development RAND

corporation study concluded that 81% of physicians say they are dissatisfied with their job, and the EHR has the most negative effect on the morale of physicians. [12]

### **3.1.4 CLONING/OVERDOCUMENTATION**

Time spent documenting and added workload are just part of the frustrations of an EHR system. The EHR, like any new technology designed to enhance care, has raised several unforeseen issues. One of these problems is termed “cloning” or repetitive documentation. [2] Cloning refers to physicians using the same wording for different visits of the same beneficiary or similar wording from beneficiary to beneficiary. The EHR allows physicians to copy notes with a touch of a button and thus charge a higher E/M code, since documenting a more detailed physical exam or review of systems qualifies for a higher service code.[2] Indeed, medicare contractors have noticed a higher frequency of medical records with identical documentation. [2]This also leads to over documentation or unnecessary documentation, as a physician may document an exam or review of systems that is irrelevant to the patient’s complaint in order to justify a higher bill.

Similar to cloning, the copy/paste function, although a common convenience, is a concern in the medical world. Copying a previous note and pasting it into a new note before updating the relevant details can save time but it also causes carelessness among providers. Medication lists are frequently copied from a previous visit and often not updated when pasted into a current note, or physical

exams and review of systems are not properly updated. [18] Therefore many providers appropriately question the accuracy of other provider notes. [18]

### **3.1.5 INFORMATION OVERLOAD**

EHRs can cause information overload when there are too many documents to sift through on the patient's chart. Each encounter can have its own document and each document has a template that may have up to 90% of the information set to default values or left empty. [18] The superfluous documentation takes away focus from the encounter and contributes to a sense of bloated notes.[2] This results in perusing a 5 page electronic note full of default values when there is only half a page of relevant information, thus decreasing physician productivity.

Further, the deluge of notes causes some physicians to ignore nursing notes and social work notes and presume those health care professionals will call if there is an issue. [18]

Another complaint regarding EHRs is that there can be hidden information. Often notes from a family or documents faxed from an outside facility will be filed in a paper binder and not seen by the provider who may assume everything is in the computer chart. These paper documents could even be misplaced or discarded. [18]

### **3.1.6 QUALITY IMPROVEMENT WITH EHR**

A promising aspect of EHRs is the potential to improve quality of care, but the implementation or mere presence of an EHR system does not equate to better quality. The ability to improve quality stems from the functions within the EHR such as results tabs and problem lists. As such, it has been shown that when physicians utilize the structured documentation and interact with the EHR effectively, quality improves. Conversely, if physicians use a dictation system and use the EHR simply as a note repository, quality is unchanged. [19]

### **3.1.7 SATISFACTION RATES**

Finally, satisfaction rates among parents and physicians in a pediatric setting showed no change when using computer documentation versus paper documentation. [20] The study did show that computer documentation visit took 4 minutes longer than the paper documentation. [20]

## **3.2 ADVANTAGES OF EHR**

Although, the EHR presents many problems (increased length of time spent documenting and decreased productivity being the most significant), it also has several advantages.

For the most part, EHRs improve communication by doing away with handwriting errors, reduce time pulling charts, and enable multiple staff to simultaneously work on the same patient chart. [7] The EHR also has a remarkable potential to improve quality of care through CPOE and further, aids in the measuring quality and performance data.[6] Studies, however, have shown mixed results regarding medical errors and adverse events with the use of CPOE.[6]

### **3.2.1 RESEARCH**

Prior to EHRs, information about quality and performance was obtained by examining insurance claims. There are several limitations to obtaining information through insurance claims such as incomplete sampling methods and the complexity of assigning attribution of specific care to physicians.[21] Searching within the EHR can overcome those obstacles because it can link care for each condition to a physician and it accounts for all patients and not just those with insurance.[21] Since patient satisfaction and clinical performance are tied to insurance reimbursements these measurements are becoming more important.

The EHR has incredible potential for research, as it can facilitate chart reviews and also increase recruitment to clinical trials by using clinical trial alerts which automatically notify the physician that a patient may be eligible for a certain clinical trial or scientific study so that they will be prompted to recruit the patient. [22] These are similar to clinical decision support alerts which pop up in patient charts



when the patient may be overdue for a screening test or if the physician attempts to prescribe a medicine to which the patient has an allergy. While adding too many clinical decision support alerts can lead to alert fatigue, a phenomenon where physicians get desensitized to the alerts, the clinical trial alerts have been shown to be efficacious.[22]

### **3.2.2 COST BENEFITS**

Normally, financial benefits of EHRs stem from reduction in transcriptionists and saving time from searching for patient charts. The EHR also more accurately captures the services provided and as mentioned, reporting and analysis of patient records is more efficient with the EHR. [14] Physicians are notoriously poor coders and the EHR can not only streamline the billing process, but also ensure the services provided are charged to the appropriate payer.

The medical document also plays an important and financially immeasurable role in malpractice cases since it is tamper proof and it can help uncover the truth. When there are inaccurate records or questions regarding treatment, a jury is more likely to favor the claimant, which highlights the potential for a well-documented patient record to save money in malpractice pay-outs.[23] The EHR prompts for more accurate documentation and time stamps all physician activity within the patient chart. Thus there is more evidence and less uncertainty during the deliberation.

There is, however, the potential of EHRs to cause more lawsuits if physicians inappropriately clone their notes.

### **3.2.3 QUALITY IMPROVEMENT**

The EHR has tremendous potential to improve quality in health care and reduce medical errors.[6] The EHR can flag drug interactions, alert a physician that a patient has poor kidney function, or remind a physician of a drug allergy. A study measuring quality adherence in four chronic conditions and cost per episode in community practices with and without EHR found promising results. The study concluded that quality was slightly improved in patients treated for hypertension and hyperlipidemia but not for diabetes or coronary artery disease. [24]

Patients may find EHR attractive because doctors report that with the EHR, health issues can be resolved with fewer in-office interactions since many visits were replaced with telephone encounters and secure e-mail messaging, saving the patient travel time. [15]

Although many physicians are dissatisfied with the EHR system, only 1 in 5 say they would prefer using paper charts again.[12] Regardless of public opinion on EHRs and all the drawbacks from the EHR, the affordable care act mandates all physicians document in an EHR.

### **3.3 SOLUTIONS TO THE EHR**

Many companies are trying to mitigate the inconveniences caused by the EHR. Two novel solutions are voice recognition software and employment of scribes.

#### **3.3.1 VOICE RECOGNITION**

Voice recognition software attempts to shorten the documentation process by allowing physicians to document in real time by speaking into a microphone and having the computer system type their words on the physician's screen while they speak. Thus, the physician does not need to type the note. Although the system is not perfect and errors in translation do occur, technological advances are making voice recognition more accurate and sensitive to an individual's voice. Though the physician is still required to proof the note, this is more desirable than a transcriptionist because the note is completed in real time and it cuts out the transcriptionist labor costs.

A study among psychiatrists showed that using voice recognition software cut typing time by almost 50% and another similar study showed an average decrease in daily typing of 51 minutes.[25] The study also determined that voice recognition was not adequate in noisy environments or on computers that have more than one user.

### **3.3.2 SCRIBES**

A scribe assists with all clerical aspects of patient care. They can record the history, enter the physical exam, document procedures, follow up on lab reports, and assist with discharges.[26] The physicians would essentially have a personal computer expert and typist at his side during the patient encounter. Scribes have been employed in several specialties and have been found extremely cost effective and beneficial.

#### ***3.3.2.1 REMOTE SCRIBES***

An ENT group in Northwest Pennsylvania has implemented remote scribes to solve the problem of the EHR. These physicians have scribes in a separate room and through wireless headsets and display monitors the scribe can see and hear the patients visit. The physician verbalizes his exam and actions and the scribe enters the data directly into the EHR. The physician is able to see the scribe's data entry directly on the computer in the room. While in the exam room, the physician can instruct the scribe to enter orders or look up labs on the EMR. [16]

The remote scribes increased patient volumes by 3.6%, and physicians were able to see 4.14 patients per hour instead of 3.81 patients and charting decreased by 140 hours over 3 months.[16]

### **3.3.2.2 RVU INCREASE**

A study in a New Jersey ED showed that the number of patients treated increased by 0.8 patients per hour with scribe usage, which led to an increase of 2.4 relative value units (RVUs) per hour. [26] During the study in 2008, Medicare was reimbursing \$38 for each RVU thus the ED was able to bill \$91 more per hour.[26] Scribes have been shown to boost staff morale. By taking responsibility of the documentation process, other staff are able to work at the top of their license thus increasing productivity and morale. Many physicians feel that typing in front of a patient is rude and, further, it has been shown that typing on a computer hinders a physicians ability to communicate.[27] Physicians and patients in a urology practice were more satisfied with the presence of a scribe. [27] Physicians were impressed with the scribe's ability to document and surprisingly, patients did not feel uncomfortable disclosing personal information in front of a scribe.[27] Employing a scribe frees the doctor from focusing on a checklist in the EHR and allows a more patient-centered interview. [27]

One ED increased billing 10% per provider and saved \$600,000 after implementing scribes.[28]

### **3.3.2.3 PRIVACY**

Many physicians are weary that an extra person may infringe on patient privacy and that the patient may not fully open up to the doctor. In the case that a physician notices a patient feeling uncomfortable with the scribe, a physician can give the

scribe a covert request such as “can you please get me that red paper on my desk.” This preset bogus request will clue the scribe to leave the room.[29]

### ***3.3.2.4 TRAINING***

Scribes can have a variety of training and skill level. Many scribe companies hire college graduates that are interested in medicine. [30] The scribes feel they are part of the patient experience and many go on to careers in medicine. Some centers transition their medical assistants into scribes.[29]

## **4.0 SUMMARY**

In summary, the EHR is an inevitable and essential part of healthcare. Quality, improved record keeping, and data gathering is greatly improved but sometimes at the physician’s expense. In many cases the physician finds him or herself as a data enterer and is caught spending more time with the computer screen than with the patient. Both voice recognition software and scribes can significantly reduce time spent on the screen, but voice recognition software still lacks the ability to navigate the EHR and enter orders. Further, voice recognition requires the physician to be in a quiet room which is not always possible or convenient. Scribes, although more costly up-front, can navigate to find labs, enter data, and take orders while the physician continues to engage the patient. Studies show that employing scribes can improve physician satisfaction, patient satisfaction, and productivity and can

ultimately save money in a medical practice. Thus, scribes appear to have a very bright future in the ever-evolving health care field.

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