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Improving the Electronic Health Record: Getting What We Wished For

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Pleas for improvement in patient health records date back to Florence Nightingale[1] and have persisted well into the 21st Century. Computer-based records, currently referred to as electronic health records (EHRs) have been proposed as a means for improving availability, legibility, and completeness of patient information. EHRs have been commercially available since the 1970s, but their adoption has become widespread only recently, driven in part by financial encouragement ($27 billion worth) from the Office of the National Coordinator for Health Information Technology. Today, almost 3 of 4 physicians report using EHRs. [2] With this increase in adoption, the medical community is now beginning to appreciate both the promise and perils of "going electronic."

There is no question that computerization has made patients' records more available and legible. With respect to completeness, however, there are now complaints that the record is too complete: electronic notes are deemed by many clinicians as being full of extraneous details, and obscuring important aspects of a patient's condition.[3]

Part of the problem with documentation in current EHRs relates to their origins. Many commercial EHRs can trace their lineage to billing systems in which clinical data functions (such as laboratory results review) were tacked on. Clinical documentation functions were a similar afterthought, added more in support of billing than patient care. This becomes evident when an EHR prompts the clinician to specify which encounter he or she is interested in before providing access to a patient's data (rather than simply providing access to the entire longitudinal record), or provides prompts that relate more to documenting the level of service than what is most clinically relevant.[4]

The documentation functions are, in a way, automated versions of an antiquated model. The documentation functions in EHRs seek to replicate problem-based medical records.[5] Accomplishing this on paper requires finding information from other parts of the patient's chart, such as diagnostic reports, flow sheets, and other clinicians' notes, and then re-entering this information into the new note. Computer-based documentation, while more legible, requires more time and effort, reducing flexibility. When the time required for the task exceeds the time available, appropriate completeness is bound to decline.

As EHRs have evolved, attempts have been made to improve the efficiency of electronic documentation. User interface features, like check boxes and shortcut functions, allow rapid inclusion of standard phrases and even boilerplate paragraphs. Such methods are less effective for capturing the complex concepts related to patient conditions and decision making. Clinical notes are filled with "pertinent negatives" (whether actually pertinent or not), obscuring the more clinically relevant details. EHRs also attempt to help with the insertion of previously recorded data into the new note, through functions such as automated

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inclusion of laboratory results, or cut-and-paste. When used injudiciously, such features only serve to further complicate “note bloat” and to perpetuate inclusion of irrelevant or even erroneous information.[6]

On the positive side, EHRs offer clinicians functions that could never be achieved with paper records. For example, computer-based clinical decision support systems that provide warnings about drug interactions, monitor the emergence of dangerous data trends, and provide reminders about health maintenance tasks have been available for decades. But the potential for EHRs to truly improve patient care processes still remains relatively untapped. The call for problem-oriented records[5] was at least partially realized in the pre-EHR era, and envisioned that computers would assist physicians in capturing clinical reasoning and make it available to other members of the extended care team, not that computers would lead to over-documentation. So how can the EHR be improved?

Empiric observational studies of clinicians have shown ways to improve EHR functionality. At Columbia University, for example, research on clinician workflow suggested the addition of a “print prescription” function to the EHR that dramatically increased compliance with medication list documentation and medication reconciliation. Research on clinicians’ information needs led to the development of “infobuttons” that provide context-sensitive, “just-in-time” access to on-line knowledge resources, expanding the use of such resources in clinical settings.

Similar research on clinical documentation processes is needed to advance this crucial EHR component. Preliminary studies [7] show that conversion to electronic record keeping induces changes in the way clinicians write their notes. Rather than composing a comprehensive snapshot of their observations, impressions, and plans as a single document (as required in paper-based records), EHR users are finding that they can exploit the ability to create drafts of their notes over the course of the day, including the copying of new information gathered elsewhere in the EHR. Because EHRs do not explicitly support this synthetic approach to documentation, users find they must add inefficient workarounds.[7]

Findings from such research can provide lessons about how EHRs can better support what clinicians are actually thinking and doing. For example, rather than copying data recorded elsewhere into their notes, perhaps EHRs should allow users to annotate these data and then simply reference them. Rather than require construction of a daily summary of a hospitalization, perhaps EHRs should capture additional interpretations and plans as they arise. Data capture would be simplified and redundancy would be eliminated; clinical notes would be replaced by a stream of additional interpretations and decisions as they emerge over time. Summaries could be produced dynamically, reflecting the present state of the clinician’s thinking (or the state at some previous time point, if necessary). This more fluid approach could help make it possible for any clinician to pick up an electronic medical record and immediately understand the thought processes of other clinicians who have been involved in the patient’s care.[5]

Improvements in the documentation process hold promise for more than simply reduced data entry effort and more readable notes. If impressions and plans can be captured as explicit data elements, using standard terminology, rather than being buried in the narrative text of a note, EHRs could use this information to better support clinical work flow. A problem or diagnosis entered in this way could allow an EHR to suggest appropriate tests and treatments, based on best available evidence. When test and treatment plans entered in this way, corresponding orders be issued automatically, and monitoring can be instituted to suggest follow-up tests or alternative strategies. Computer-based functions such as these

have already been developed; they are merely waiting for the necessary improvements in clinician documentation to be able to bring their knowledge and logic to bear.

Visions such as this are not new, nor is the importance of moving beyond the idea that EHRs are just sophisticated record keepers.[8] EHRs had to start someplace, and they delivered what many wished for. Rather than complain about the challenges they have introduced, clinicians should recognize that current EHRs are illuminating the opportunities for the next generation of systems that will support clinicians as active partners across the spectrum of healthcare settings and tasks.

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