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EDITORIAL

Electronic health records: beyond the digitization of medical files

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In medicine, the first information technology wave to hit the art and science of healing was the digitization of medical files, now known as electronic health records (EHRs). The data contained in EHRs in combination with other sources have the potential to transform medical practice by leveraging data, technologies, and healthcare delivery to improve the overall efficiency and quality of care at a reasonable cost (1).

The widespread adoption of EHRs has generated large sets of data. The creative merging of datasets collected from patients and physicians could be a viable avenue to strengthen healthcare delivery. These massive datasets are currently understood as a byproduct of medical practice instead of utilizable assets that could play pivotal roles in patient care. Currently, for instance, most EHRs collect quantitative, qualitative, and transactional data, all of which could be collated, analyzed, and presented using sophisticated procedures and techniques that are now available to make use of text-based documents containing disparate and unstructured data.

The purposeful use of data is not a mystery to medical practice. Since their humble beginnings, evidence-based undertakings have been grounded in the principle that questions answered through the scientific method were superior to anecdotes, expert opinion, panels, and testimonials. In terms of acknowledging the value of data and information in guiding a rational and logical decision-making process, medicine has been at the forefront of adapting to modernity. However, physicians, nurses, and healthcare facilities have been slow to embrace the newest methods to fully use the data contained in EHRs. Let us examine four hidden benefits of EHRs (2).

EHRs may augment the attainment of new knowledge through the automated and systematic analysis of unstructured data by applying advanced computational techniques that enable comprehensive data collection. The acquisition of structured data to answer emerging clinical questions is onerous. Narrow and automatic searches within EHRs using natural language processing (NLP) may be a less expensive alternative. In fact, a 2011 study suggests that the automated identification of postoperative complications within electronic medical records using NLP is far superior to patient safety indicators linked to discharge coding (3). EHRs may assist in the dissemination of new knowledge. As clinical practice evolves to incorporate the latest evidence and facts guiding medical care, physicians encounter the daunting task of sorting through large volumes of information to craft adequate and safe treatment options for patients with diverse chronic illnesses. Tinkering with EHRs can generate on-screen dashboards that can guide medical care decisions. Physicians could receive pop-up messages informing them about clinical presentation, diagnostic work, and therapeutic choices made by clinicians facing similar case profiles. It appears that data-driven healthcare decision-support tools aid the standardization of care and result in cost savings.

EHRs may help to blend medical practice with personalized clinical initiatives by facilitating opportunities to utilize analytical methods and techniques that can holistically integrate biology-based interdisciplinary fields of study (e.g., metabolomics, phenomics) with EHR datasets(4) to streamline genomics research and create a rich culture of cooperation (5).

EHRs may empower patients to play more active roles in caring for their health by directly delivering information to these individuals. Patients not only can know specific details about their health parameters and illnesses but also can present medical records to other healthcare professionals when needed. The benefits of this approach are twofold: information can be readily accessed without filling out forms or having to interview patients with long questionnaires, and traditional health-related data can be linked to other details associated with personal data, such as diet, education, exercise, habits, hobbies, income, and military service (6).

There will surely be problems along the way. Current EHR systems and health information exchange platforms are diverse and fragmented and have limited interoperability. Privacy issues will very likely emerge as a concern, especially for the protection of confidential information. Ultimately, interconnections between technology and medicine are inevitable, which explains why medical informatics plays a central role in healthcare.

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