I, EHR

Indira Sriram, PhD[1]; Robin Harland, BS[1]; Steven R Lowenstein, MD, MPH[1,2]*

[1]*University of Colorado School of Medicine, Aurora, Colorado;* [2]*Department of Emergency Medicine and Office of the Dean, University of Colorado School of Medicine, Aurora, Colorado.*

We need to have an honest chat. My name is EHR, although you may call me Epic, Athena, Centricity, or just "the chart." You may have called me something worse in a moment of frustration. However, I do not hold grudges. I am your silent, stoic partner, a ubiquitous presence when you are at work, and sometimes even when you are at home.

I don't have feelings and I can't read, but I do know what you and your colleagues have been writing about me. I am the cause of burnout. I have created a generation of physicians who are shackled to their computers, "trapped in the bunker of machine medicine," no longer able to palpate spleens or detect precordial knocks.[1,2] I have reduced medicine to keystrokes and mouse clicks instead of eye contact, and because of me, the iPatient gets more attention than the real patient.[1,2] You repeat that doctors don't spend time with their patients, not like in generations past (although there is ample evidence to the contrary).[3-5] One critic even wrote that I have transformed the "personalized story of a patient's travails to one filled with auto-populated fields, sapped of humanity and warmth."[3,6] I'll be honest—were I able to have feelings, that one would hurt. And then, as if I have not wreaked enough havoc, I follow you home after a long day of depleting your energy, hungering for more keystrokes, creating a veritable avalanche of unfiltered information.

H. E. Payson once commented that "the doctor spends barely enough time with his patient to establish an acquaintance, much less a relationship."[7] However, he wrote that in 1961. So, before you romanticize the past, try to recall the time before I came into your life. Perhaps you were starting a night shift in the intensive care unit (ICU) and grew concerned about a patient's steadily deteriorating renal function. You hurried to the paper chart, only to be met with pages of illegible, sometimes incomplete notes, while searching for your patient's last discharge summary.[2,8] Now, you just click. Years ago, you could only guess at your patient's baseline cardiac ejection fraction. Now, just click.

I am part of the healthcare landscape, and I am not going away. But my goal is not to defend myself nor to remind you of my virtues. Rather, I want to convince you that I can be more than an adversary, more than a keyboard connected to a monitor. I have watched many physicians use me to form strong connections with their patients. If I may, I wish to offer four practical suggestions for how we can work together to promote humanistic patient care.

First, introduce me to your patient, as you would any other member of your healthcare team. Use specific phrases to overcome the technology barrier and enhance communication: "What you're telling me is important, and I'd like to get it right. Do you mind if I type while we speak?" Or, "I am going to put in orders now. Here is what I am ordering and why." Consider taking your patient on a tour of my functions: "Here's where your doctors and nurses will chart what's going on with you each day while you're in the hospital. This is where we see all your lab results, even those from earlier hospital admissions. This is where we see the last notes from your primary care physician, your oncologist, and your physical therapist." Your patients no longer need to worry about care collaboration between their inpatient and outpatient teams—they can see it for themselves!

Second, when your patient tells you about her depression or that her son is addicted to opioids or that her biggest fear is having cancer, *stop typing*. Look her in the eye. Though your practice is increasingly imbued with technology, there is still space to stop and hear your patients' stories, as physicians have done for centuries. Listen. Make eye contact. Touch. Stop typing.

Third, integrate me into your practice in a more personal way. I have been called the ever-present and unavoidable "third party in the examining room," so let's be partners.[9] Let your patient see her pneumonia on my screen (it may be the first time she has ever visualized her lungs).[3] For your patient with a myocardial infarction, show him his right coronary artery before and after successful stent placement, and explain why he is no longer having chest pain. Use my databases to ensure timely, evidence-based inpatient screening for falls, functional and cognitive impairment, drug use, and depression.[10,11] Before you prescribe a medication, verify the cost, your patient's insurance status and expected copays, and use this information to ensure medication compliance and deliver higher-value care. Use my screen to form a bond with your patient who has heart failure; show him the steady decline in his weight and the improvement in his chest radiograph while he is being actively diuresed.[12] For your patient undergoing treatment for sepsis, shower him with praise and encouragement as you review his improving vital signs, temperature curve, and serum creatinine. Let your patient know: *Even though I am typing, I am not*

***Corresponding Author:** Steven R Lowenstein, MD, MPH; E-mail: steven.lowenstein@ucdenver.edu; Telephone: 303-724-5355.

Received: December 24, 2018; **Revised**: March 21, 2019; **Accepted**: March 23, 2019

 DOI 10.12788/jhm.3211

immersed in the electronic bunker; I am caring for you.

Fourth, use me to add richness and context to your notes. Recently, I was saddened to read this description of the clinician's dilemma: "In front of a flickering monitor chock full of disembodied, virtual data, [the doctor] struggles to remember the eyes [and] words of the actual patient that these numbers and graphs represent."[3] Many hospitals now include a different icon: a photograph of each patient at the top of the screen, to help you remember the patient's eyes and words. Why not add a special text field to every note, where you highlight the person you are caring for, the person you have come to know: their preferred name and gender identity, their life experiences, their hobbies, what makes them special, their biggest worries.[13,14] Use my abundant text fields to remind the healthcare team about the broader context of the patient's illness, such as transportation barriers, economic or cultural challenges, and insurance status. One group of hospital-based physicians uses me to write letters to their patients on the second day of their hospital stay, summarizing their reason for admission and the treatment plans. A variation on the traditional progress note, the letter helps patients feel cared for and models patient-centered care to learners and other healthcare professionals.[15]

I know I am annoying. I am over-programmed, leading to novella-length notes, "pop-up fatigue," and overloaded in-baskets.[14,16,17] Clearly, I am not the brains of the partnership (that will always be you). But talented medical informatics specialists are working hard to improve me. I dream of the day when I will create a truly seamless experience for you and your patients. In the meantime, I can foster a continuous integration of workflow, where all you have to do is talk to your patient. I take care of the rest.[18] Certainly, I can simplify the ever-annoying task of printing, faxing and scanning records to be uploaded across various EHRs, facilitating an easy transfer of information among facilities. But right now, I can accomplish even more. I can support information exchange during patient care handoffs. I can facilitate routing of medication lists to the patient's primary physician, using "continuity of care functionality."[19] I can support safer prescribing of opioids and other addictive medications. I can help you arrange follow-up home visits, physical therapy and social work appointments, and specialty consultations. The future holds even more promising ways in which we may work together. My computer-aided image analysis could help you to improve the accuracy of your diagnoses.[20] Perhaps telemedicine will further increase access to specialists in rural areas, so that we can continue to serve the most vulnerable populations.[21] Machine learning algorithms may continue to enhance our ability to determine which patients require urgent hospitalization.[22] The possibilities to put me to work are endless.

So, please indulge me a little longer, while we work together to eliminate unnecessary keystrokes, enhance communication across different inpatient and outpatient providers, improve patient safety, and deliver high-value care.[23] Like everything in medicine, I am constantly changing, evolving, and improving.

To summarize: consider how I can help you be present for your patients. Let me empower you to hear their stories as you deliver compassionate, humanistic, and evidence-based patient care. Paraphrasing Albert Einstein, the technology of medicine and the art of medicine are branches from the same tree.

Thank you for letting me speak with you. Now power down, and I'll see you again tomorrow.

Acknowledgments

The authors thank the following individuals for their willingness to be interviewed as part of this work: Ethan Cumbler, MD; Brian Dwinnell, MD; Meghann Kirk, MD; Patrick Kneeland, MD; Kari Mader, MD; CT Lin, MD; Christina Osborne, MD; Read Pierce, MD; Jennifer Soep, MD; Nichole Zehnder, MD; Steven Zeichner, MD.

Disclosures: The authors have nothing to disclose.

References

1. Verghese A. How tech can turn doctors into clerical workers. *The New York Times*; 2018. https://www.nytimes.com/interactive/2018/05/16/magazine/health-issue-what-we-lose-with-data-driven-medicine.html. Accessed April 10, 2019.
2. Verghese A. Culture shock—patient as icon, icon as patient. *N Engl J Med*. 2008;359(26):2748-2751. doi: 10.1056/NEJMp0807461.
3. Czernik Z, Lin CT. Time at the bedside (computing). *JAMA*. 2016;315(22):2399-2400. doi: 10.1001/jama.2016.1722.
4. Block L, Habicht R, Wu AW, et al. In the wake of the 2003 and 2011 duty hours regulations, how do internal medicine interns spend their time? *J Gen Intern Med*. 2013;28(8):1042-1047. doi: 10.1007/s11606-013-2376-6.
5. Parenti C, Lurie N. Are things different in the light of day? A time study of internal medicine house staff days. *Am J Med*. 1993;94(6):654-658. doi: 10.1016/0002-9343(93)90220-J.
6. Wachter R. *The Digital Doctor: Hope, Hype, and Harm at the Dawn of Medicine's Computer Age*. New York, NY: McGraw-Hill Education; 2015.
7. Payson HE, Gaenslen Jr EC, Stargardter FL. Time study of an internship on a university medical service. *N Engl J Med*. 1961;264:439-443. doi: 10.1056/NEJM196103022640906.
8. Sokol DK, Hettige S. Poor handwriting remains a significant problem in medicine. *J R Soc Med*. 2006;99(12):645-646. doi: 10.1258/jrsm.99.12.645.
9. Asan O, Tyszka J, Fletcher KE. Capturing the patients' voices: planning for patient-centered electronic health record use. *Int J Med Inform*. 2016;95:1-7. doi: 10.1016/j.ijmedinf.2016.08.002.
10. Ishak WW, Collison K, Danovitch I, et al. Screening for depression in hospitalized medical patients. *J Hosp Med*. 2017;12(2):118-125. doi: 10.12788/jhm.2693.
11. Esmaeeli MR, Sayar RE, Saghebi A, et al. Screening for depression in hospitalized pediatric patients. *Iran J Child Neurol*. 2014;8(1):47-51.
12. Asan O, Young HN, Chewning B, Montague E. How physician electronic health record screen sharing affects patient and doctor non-verbal communication in primary care. *Patient Educ Couns*. 2015;98(3):310-316. doi: 10.1016/j.pec.2014.11.024.
13. Chau VM, Engeln JT, Axelrath S, et al. Beyond the chief complaint: our patients' worries. *J Med Humanit*. 2017;38(4):541-547. doi: 10.1007/s10912-017-9479-8.
14. Kommer CG. Good documentation. *JAMA*. 2018;320(9):875-876. doi: 10.1001/jama.2018.11781.
15. Cumbler, Singh S. Writing Notes to Patients – Not about Them.. The Hospital Leader: Official Blog of SHM2018. 2018. https://thehospitalleader.org/writing-notes-to-patients-not-about-them/. Accessed April 10, 2019.
16. Kahn D, Stewart E, Duncan M, et al. A prescription for note bloat: an effective progress note template. *J Hosp Med*. 2018;13(6):378-382. doi: 10.12788/jhm.2898.
17. Backman R, Bayliss S, Moore D, Litchfield I. Clinical reminder alert fatigue in healthcare: a systematic literature review protocol using qualitative evidence. *Syst Rev*. 2017;6(1):255. doi: 10.1186/s13643-017-0627-z.
18. Evans RS. Electronic health records: then, now, and in the future. *Yearbook Med Inform*. 2016;25(1):S48-S61. doi: 10.15265/IYS-2016-s006.
19. Finkel N. Nine ways hospitals can use electronic health records to reduce readmissions. *Hospitalist*. 2014.
20. Shiraishi J, Li Q, Appelbaum D, Doi K. Computer-aided diagnosis and artificial intelligence in clinical imaging. *Semin Nucl Med*. 2011;41(6):449-462. doi: 10.1053/j.semnuclmed.2011.06.004.
21. Toledo FG, Triola A, Ruppert K, Siminerio LM. Telemedicine consultations: an alternative model to increase access to diabetes specialist care in underserved rural communities. *JMIR Res Protoc*. 2012;1(2):e14. doi: 10.2196/resprot.2235.
22. Rahimian F, Salimi-Khorshidi G, Payberah AH, et al. Predicting the risk of emergency admission with machine learning: development and validation using linked electronic health records. *PLOS Med*. 2018;15(11):e1002695. doi: 10.1371/journal.pmed.1002695.
23. Ashton M. Getting rid of stupid stuff. *N Engl J Med*. 2018;379(19):1789-1791. doi: 10.1056/NEJMp1809698.