Ross,

Thanks to you and David for posting this incisive analysis of the reasons comprehensive regulatory reform is a necessary component of our efforts to improve the user experience of EHRs and allow them to accomplish the goals for which they were intended. The concept that regulatory reform and platform improvement are **both** required to help address the problem of physician burnout is not new to this forum. It has been discussed at length in a number of prior threads including *UCSF Medical Study: Clinicians Copy and Paste Nearly half of EHR Progress Notes* (5/31-6/1/17) and *A Time-Motion Study of Primary Care Physicians’ Work in the Electronic Health records Era* (2/27-3/25/18). In that latter thread I wrote (with apologies for quoting myself):

*Data entry is assigned to the busiest, most highly trained members of the health care team – front-line clinicians. In fact, the resulting increased cognitive load and decreased situational awareness impair our ability to focus, comprehend, and solve the patient's problems…solving this problem will require significant payment reforms. Regulators and administrators continue to demand "vastly more justification for charges," and fail to prune obsolete requirements or rethink the documentation process. For example, every clinic note does not need the patient's entire medical history, and the archaic, counterproductive 1997 CMS bullet point system does not produce quality documentation.*

I would add that the capabilities of the EHR have been crucial in allowing payers to adopt extremely granular oversight applied with a “gotcha” mentality focused on refusing payments, sanctioning practitioners, or both. Such counterproductive oversight is another factor contributing to note bloat and physician burnout.

As much as I appreciate and agree with the articulate and data driven analysis in the Downing, Bates & Longhurst paper, I would argue that regulatory reform alone is not the answer either. Disruptive platform innovation is also sorely needed. The documentation process and the entire structure of the EHR need to be re-envisioned and redesigned as a tool for clinical workflow support and better care of the sick, rather than as a GUI applied to administrative, financial, regulatory databases, requiring a plethora of activities which degrade efficiency and waste time, talent, and resources.

As pointed out in the Wachter and Goldsmith *Harvard Business Review* paper I posted on 4/11/18, we need to abandon the Windows 95 level mouse and keyboard interfaces and utilize artificial intelligence and natural language processing to aggregate information on the problem at hand and automatically record the documentation necessary for the encounter. We need novel data visualization techniques and innovative displays which utilize flexible, specialty-specific structures to emphasize the interval history, laboratory and radiographic data, and clinical reasoning **most pertinent to the current encounter** in a form that reduces cognitive load, can be co-edited by multiple clinical team members, and can evolve rapidly as their contributions are incorporated.

Unfortunately, the current EHR ecosystem is oligopolistic, highly regulated, tightly focused on maximizing profit rather than healthcare for the common good, and suffering from a severe case of path dependency. The majority of healthcare IT’s promises to improve the quality and safety of care and improve the patient experience are unfulfilled. Those promises will remain unfulfilled until we do the hard work to understand clinical workflows at a deeper level and provide human-factors-aware systems that make clinicians better and more efficient at what they actually do at the bedside. How can we, as academic and clinical informaticians, foster the development of incentives for industry and regulators to at least start breaking this logjam?

It's easy to dismiss discussion like this as pie in the sky and to conclude that I am just crazy and unrealistic. John F. Kennedy gave his "We choose to go to the moon..." speech at Rice University on September 12, 1962. On July 20, 1969, Neil Armstrong set foot on the moon. We probably won't see that level of national purpose and federal government support for any project ever again. But as we consider the social and financial distortions produced by a healthcare system which consumes nearly 20% of GDP and the unsustainable cost growth of that system, isn't developing arguably the most important tool necessary to put the system on a better trajectory nearly that important?