

## Clinical Informatics: Journeys into an Emerging Subspecialty

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Clinicians of all backgrounds have experienced the challenges of the introduction of clinical information systems, yet we know well that technology can enhance and connect our personal lives. Nonetheless, with vast—and growing—streams of health-related data, information, and knowledge about patients and populations, assimilating intelligent computational systems into healthcare systems is essential to support busy and overburdened clinicians to function at the top of their licenses. Embracing information technology in current clinical practice is inevitable, and some clinicians may consciously choose to pursue subspecialized knowledge and skills in this field. Known as clinical informatics, it is the discipline of applying information technology to better understand and deliver health care. As a rapidly growing subspecialty, clinical informatics now includes a growing number of advanced training pathways, including graduate degrees and certificates in informatics disciplines, fellowship training programs, and subspecialty board certification accredited by the ACGME (Accreditation Council for Graduate Medical Education). Prior to these more contemporary pathways to informatics training, applied experience as a clinician executive or degrees in computer science oriented disciplines were more prevalent, and are still commonplace with the “grandfathering” of eligibility for the board certification examination. This article describes two potential pathways and personal journeys of two clinical “informaticians” to inform young physicians contemplating a career in clinical informatics.

### Clinical Informatics, a Physician Perspective

As a medical student and internal medicine resident, electronic health records were already an integral if understudied element of the training experience. However, my practice-driven insights about informatics evolved in parallel with policy-shaped practice changes and a personal thirst for greater understanding. In residency, as Meaningful Use incentives came to be, my practice perspective of informatics was limited to rule-based order sets and best practice alerts, and manually crafted summary reports, such as handoff reports and discharge summaries. Patient portals were a new offering for clinic patients, one that I had been cautioned about adopting by my continuity clinic attending who frowned upon the potential added, non-reimbursed time and effort it would take to maintain such service. Upon completing my residency to enter practice as a primary care physician, I realized that I needed more information about my patient population: how well-controlled was blood sugar for my patients with diabetes? why did it take so long to interact with the system to complete notes? I naturally gravitated towards work that would address these questions in my practice, and sought greater freedom in learning about organizational best practices that addressed these challenges. For these reasons, I pursued a fellowship in Medical Informatics, and subsequent board certification in Clinical Informatics. As with the majority of practicing clinicians, obtaining a graduate degree was not a feasible option for me, and the fellowship pathways

followed by board certification, as a subspecialty, seemed the most achievable option. In the longer term, the board certification also appropriately emphasizes organizational and cultural infrastructure relevant to health IT systems, rather than technical knowledge and skill about health-care computing alone.

### Clinical Informatics, a Physician-Scientist Perspective

With prior experience as a professional software developer before entering medical school, I already expected to contribute more through research and development than by direct clinical care. I completed a joint Medical Scientist Training Program with an MD combined with a PhD in computer science. Ultimately, I did complete medical residency training for the unique rewards of direct clinical care and to inform my research to address clinically relevant questions. I sought to identify technologies that I wanted to “pull” into my hospitals and clinics rather than having them pushed onto us by staff or leaders who’ve never experienced the challenges of clinical practice themselves. More so, if such technologies did not yet exist, it inspired me to identify opportunities to create them. With my background, I was eligible for a research “fast track” to excise one year of residency training through to a fellowship and further research. When asked in 2011 what subspecialty I wanted to fast track into, I easily stated “Medical Informatics,” but was told, “That’s not a real specialty. You’ll have to choose some-

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thing else.” Instead, I got the full value out of a complete medical residency training, including time to prototype a concept on data-mining electronic health records to generate clinical decision support content. A subsequent Veteran Affairs Fellowship in Medical Informatics gave me the protected time to develop my research ideas and to successfully compete for an NIH Big Data 2 Knowledge Career Development Award. This has given me a platform for continued development of medical informatics innovations and implementations, as well as board certification through the Practice Pathway.

In closing, computers and information systems will increasingly intertwine into all aspects of health care in order to help manage the escalating complexity of the field. Practicing clinicians seeking added formal training in clinical informatics necessarily have a variety of potential professional training pathways, depending on long-term career goals as well as personal resources like time and finances to commit to such training. Board specialization in Clinical Informatics is fortunately an option for practicing clinicians with existing informatics experience in practice, but the grandfathering period is closing quickly (just extended

until 2022). Despite this, the good news is that the field is growing and, as it grows, so do the introspection and feedback needed to improve the certification and training processes. While we have described only two possible training pathways, there may be more options to come in the future. As clinicians, we must either own and drive these processes or be overrun by them.

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*\* For more information about informatics as a specialty and the American Board of Preventive Medicine's Clinical Informatics Board Certification exam, please visit: <https://www.amia.org/applications-informatics/clinical-informatics> and <https://www.theabpm.org/examinfo-ci.cfm>.*