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EDITORIAL

ICT: This Transformer Isn't Science Fiction

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A recent video by David Kraft on the future of medicine featured on TED[1] generated lots of gee-whiz excitement, spurring more than 350,000 views at this writing, as well as nearly 100 comments. His FutureMed conference, held February 2011, included tracks on data-driven health, personalized medicine, regenerative medicine, future interventions such as robotic surgery, neuromedicine, and medtech/biotech and entrepreneurship.

Richard Barker presents a more sobering point of view in his book *2030: The Future of Medicine*.[2] A personal electronic health record containing an individual's genomic information, with access by any health provider, and tailored treatments that focus on outcomes rather than process, may work to reform systems such as those in the UK and United States, which he believes are largely unsustainable at current levels. Personal responsibility for good health habits will help keep people out of the hospital. If the pharmaceutical industry refocuses on personalized medicine, and the regulatory system can evolve to one that is risk-based, there is a chance that people in 2030 will enjoy good, affordable health outcomes.

There is no doubt that information technology will play a crucial role in advancing medicine's future. "The international research consortium ITFoM (Information and Communication Technology for Future Medicine) anticipates the medicine of the future, based on molecular, physiological, and anatomical data from all individual patients."[3] The group predicts that the requirements of medical ICT will soon surpass demands of other data-intensive fields, with ICT replicas of most humans on the planet the "holy grail" of personalized medicine, perhaps achievable in 30 years.

So where is the sweet spot right now for cost-effective, VR-augmented interventions and those that rely on social media? A review of a few promising developments that are coming online may yield some clues.

Virtual reality training for surgeons. Certainly, while there will always be a need for surgeons to practice communication and decision-making skills with a live patient, the potential of physician technical training in virtual environments is just beginning to be tapped. While studies have shown that VR training improves speed and accuracy, we need to conduct more studies to show how these improvements relate to patient outcomes.[4] Nonetheless, exciting developments include training on 3D reconstructions of patient-specific data, which may allow us to build a library of such images. Combining a live actor with such a simulation may prove a cost-effective way to deliver curricula to surgeons.

Aging populations begin to embrace eHealth. A recent survey in the United States and in Israel showed that older adults will invest resources in ICT, but only when they become convinced that such technology will result in significant benefits.[5] A literature review found that there are many effective, Internet-mediated, complex interventions for the 50-plus age group, with multiple studies reporting positive lifestyle changes, though the effectiveness of the social networking component of these interventions remains an open question.[6]

ICT as health system transformer. Because developing countries don't have the capacity for European- and US-style provider regulation and oversight, ICT-based "self-regulatory" mechanisms could ensure delivery of good-quality care at a reasonable cost for these populations. In countries regulated by social pressure and cultural beliefs, ICT facilitates communication among stakeholders across social groups and geographic boundaries. Disease-specific social networks may shape public and private industry policy, as was accomplished by groups of people living with AIDS in making sure that pharmaceutical companies made antiretroviral drugs available to all regardless of ability to pay.[7]

Will ICT transform health across the globe? There seems no doubt. While *how* it will affect our health is not yet entirely clear, surely the promises of VR-mediated therapy and interventions including social networking are just beginning to be fulfilled.

References

1. Kraft D. Medicine's future? There's an app for that. Posted June 2011. http://ted.us1.list-manage.com/track/click?u=07487d1456302a286cf9c4ccc&id=d9a3078eee&e=1a9433badd (accessed Jan. 10, 2012).
2. Barker R. (2010) *2030—The future of medicine. Avoiding a medical meltdown.* Oxford: Oxford University Press.
3. Lehrach H, Subrak R, Boyle, et al. ITFOM—The IT future of medicine. Procedia Computer Science 2011; 7:26–29.
4. Hanna L. Simulated surgery: the virtual reality of surgical training. Surgery 2010; 28:463–8.
5. Heart T, Kalderon E. Older adults: are they ready to adopt health-related ICT? International Journal of Medical Informatics 2011; in press.
6. Aalbers T, Baars MAE, Olde et al. Characteristics of effective Internet-mediated interventions to change lifestyle in people aged 50 and older: a systematic review. Ageing Research Reviews 2011; 10:487–97.
7. Lucas H. Information and communications technology for future health systems in developing countries. Social Science & Medicine 2008; 66:2122–32.

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