

Editorial

SCALPEL, STETHOSCOPE, IPAD: THE FUTURE IS NOW IN THE INTENSIVE CARE UNIT

By Richard H. Savel, MD, and Cindy L. Munro, RN, PhD, ANP



Since its earliest days, critical care has been associated with advanced technology. Yet, as I (R.H.S.) round the intensive care unit (ICU) during my duties as medical codirector, I see that now some of the most important new high-tech tools in view are not installed by the hospital, but are being carried around by the physician assistants, residents, fellows, nurses, and, of course, me. What I refer to is the omnipresence of powerful handheld communications devices, such as smartphones and tablet personal computers (PCs), that are fundamentally changing the quantity of information available to clinicians where they need it the most: at the point of care. These are far more than storage devices; they are sophisticated communication tools with beautiful full-color screens, and high-speed Internet access, and they offer users the ability to communicate, via voice or text, on a global level.

Although largely undiscussed, an increase in social networking among ICU team members has run nearly parallel to recent improvements in wireless hardware. As we saw during the recent revolution in Egypt, the role of social networking in organizing how people communicate—and perhaps, even think—should not be underestimated. In this editorial, I will explore how these advances in tech-

nology have changed the way health care workers interact in the ICU, and some ways to use this technology to optimize the function of multidisciplinary teams and improve patient care.

Smartphones and Text Messaging

Handheld devices that can provide clinical information date back to the PalmPilot (Palm Inc, Sunnyvale, California) in 1997 and such programs as Epocrates (Epocrates Inc, San Mateo, California) for pharmaceutical look-up.¹ Though the device could be synchronized with a computer, there was no easy way for devices such as the PalmPilot to access the Internet in a wireless fashion. Nevertheless, despite their small primarily black-and-white screens and lack of wireless connectivity, they could provide rapid clinical answers to important questions.

Fast-forward a bit to the rise of the BlackBerry device (Research in Motion, Waterloo, Ontario, Canada). Though the Palm corporation attempted to develop a “convergence” device with their Treo, the BlackBerry devices were adopted quite heavily by both the consumer market and clinicians, with some data indicating that their use can be associated with improved communication in the ICU.² Though these devices became popular and had Internet access, their forte was e-mail and text messaging. Unfortunately, the user’s Internet experience was limited by the device’s small screens, and

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major important medical applications were unavailable on the BlackBerry devices. Some users (myself included) were “forced” to carry around 2 devices: a personal digital assistant (PDA) for medical purposes and a smart phone for e-mail and text messaging. Importantly, text messaging has remained a staple of communication in general. Texts can be used quite efficiently in the ICU. For example, I often need to notify a surgeon of an important but not urgent issue (“Please come by and evaluate Mrs Jones in room 10 for a tracheostomy”) or provide him or her with a detailed update (“The most recent hematocrit on your patient is 23. As per our previous conversation, we will transfuse the patient”).

More recently, smartphones have been developed (specifically the iPhone [Apple Inc, Cupertino, California] and Android-based devices such as the DROID [Motorola Mobility Inc, Libertyville, Illinois]) that have revolutionized what can be done with a handheld device. David Pogue of the *New York Times* has coined the term “App Phone.”^{3,4}

At a baseline, these smartphones can provide voice communication, text messaging, and tightly integrated e-mail, but both also have “application stores” associated with them where users can download applications (many for free) onto their devices. Of note, both the iPhone and DROID devices are designed as, basically, slabs of glass to optimize the Internet experience for the user. Finally, a tech-savvy ICU clinician can own a single device that allows him or her to look up clinical information, search the Internet, and communicate with colleagues and family.

iPads and Other Tablet PCs

The most recent advance in the handheld computer arena is not something smaller, but something larger. Though the concept of the tablet PC has been around for some time, the public interest in such a device was minimal. Even Apple had tried and failed in this arena with the Newton MessagePad in 1993.

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However, in April 2010, Apple released their tablet PC, the iPad, to an incredibly positive reception, with more than 15 million sold from its release to the end of 2010. At approximately 8 x 10 in and 1.5 lbs, it has the dimensions of a heavy magazine. Although I was skeptical at first, the device has changed my life dramatically. Evidently, other clinicians share my enthusiasm.⁵⁻⁹

The iPad has improved my professional life on several levels. First, I am lucky enough to be part of a test project at my hospital wherein all radiological studies can be viewed wirelessly on the iPad. This has been truly exciting, as I can pull up the relevant x-ray image for a patient, bring it right to the bedside with the nurse, and share the image with him or her. The speed with which the images are brought to the screen and the quality of the images are breathtaking.

Next, I use the iPad as a repository for medical papers that I have been collecting on my computer during the last decade or so. Over the years I have collected hundreds of papers, and I moved them all onto my iPad with lots of room to spare. My iPad synchronizes wirelessly with my computer (using a program called Dropbox [Dropbox Inc, San Francisco, California]) and I can set up various collections of papers for teaching purposes (eg, Journal Club, Key Landmark Studies, New Articles).

Now, when I’m on rounds, I don’t just talk about an article anymore; I bring the article up on my iPad in full color. I can sit with the medical students wherever there is room and start a discussion about key randomized critical care trials, take out a

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recent paper on mitral valve repair and show the nurses a full-color diagram of what the surgeon just did, or show family members of a patient with acute respiratory distress syndrome what is going on in their loved one's lungs. For me, the ability to carry around my entire medical library of papers and view any of them instantly in full color is reasonable enough to own such a device.

Lastly, I use the iPad as the physician coeditor of this journal to carefully pore over each and every manuscript assigned to me. Not only can I keep all of the manuscripts with me at all times (to provide a prompt response to the authors), but I'm also "going green" by rarely printing anything.

Social Networking and the ICU

As recently portrayed in the academy-award winning movie *The Social Network*, Facebook (Facebook Inc, Palo Alto, California) has changed the way 500 million people communicate and interact with each other. As has been noted, if Facebook were a country, it would be the third largest, behind China and India. At the ICU level, I have found that most of my physician and nurse colleagues (and respiratory therapists and pharmacists for that matter) are on Facebook, and I like that this allows me to keep in touch with what is going on with them when I'm not on service, and to share things with others when I'm not around. I have often commented that I feel like I'm meeting a celebrity when I come back on service and see a nurse that I haven't see for a while, but know that he or she recently had a great time on vacation. After all, I've already seen the pictures.

Businesses of all kinds, including academic medical centers, medical schools, and even critical care nursing associations, are flocking to have a presence on Facebook. At the same time, concerns have arisen about the proper protocol if a family member or patient asks to "friend" you on Facebook.^{10,11} The answers to these kinds of questions are not easy, but one thing is clear: social networking is not going away anytime soon.

Conclusion

As practicing ICU clinicians, we are all fans of technology in one way or another, or we wouldn't have been drawn to critical care in the first place. We tend to be early adopters and believe that with the strategic use of technology we can help get our patients and their families through their critical ill-

nesses. I want to shout as loudly as I can how exciting it is as an academic intensivist to be able to use my iPad to teach members of the multidisciplinary critical care team. Given how far we have come, even just in the last decade, the future truly is bright. In fact, given the incredible power of the current generation of handheld devices, the future is now.

The statements and opinions contained in this editorial are solely those of the coeditors.

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FINANCIAL DISCLOSURES

None reported.

eLetters

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