

Future Forums for Clinical Trials

PDAs, Facebook, Twitter, and More

This article presents the current state of connectivity that preoccupies humankind, with commentaries on various types of technology, how they are used in clinical trials, and how they influence the entire research process.

Wireless technologies dominate 21st-century communications. Cell phones and Wi-Fi exploit radio frequencies in ways that would dazzle early radio engineers. The popularity of social networks like Facebook and Twitter, text-messaging services, and the myriad applications of Apple iPhones and BlackBerry Smartphones points to the development of a new way of life for humankind as new technological capabilities feed consumers' ever-increasing desires for speed, instant gratification, and connectivity. *USA Today* noted that "the social-networking industry is expected to become a \$3.3 billion market worldwide by 2013," that "smartphones power the trend," that Facebook now has 250 million members, and, in April 2009, "Twitter's 40 million users spent nearly 300 million minutes on the site."¹

Meanwhile pharmaceutical clinical researchers—a vital part of "one of the most [research and development]-intensive industries in the United States"²—are still struggling to accept such not-so-new innovations as electronic data capture (EDC) and personal digital assistant (PDA) devices in the form of electronic patient-reported outcome (ePRO) collectors or patient diaries. Much of the industry continues to prefer paper documentation for the data gathered during clinical trials. More than a dozen years after the introduction of web-based EDC (and after at least two decades of remote data capture), only 50% of currently conducted clinical trials use EDC and/or ePRO, and just 32% are web-based, according to CenterWatch's *State of the Clinical Trials Industry: A Sourcebook of Charts and Statistics*.³ In 2008, 40% of clinical trials that used ePRO or patient diaries used a handheld, web-based, or interactive voice response (IVR)-based electronic version.³ When the use of IVR technology was introduced in the early 1990s, its eventual 100% acceptance was more than 10 years in the making. It seems that even though it is innovation that drives research and development, the systems that can be used to speed product development continue to be debated and second-guessed.

BioPharma Industry Debate

Is this debate caused by the dichotomy that exists between knowing the value of useful technology that can speed up the information dissemination process and the misinformation that it can spread? Perhaps the industry fears that the changes Facebook and Twitter have brought to the realm of politics might distort familiar sources of information. Uncertainties may abound as reliable handwritten documents are replaced by data from more

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remote and unseen sources (i.e., a screenshot of a box with a check mark).

However individuals view the current wave of technological changes that are influencing the way humans behave toward one another, these innovations are becoming the norm and dictating the way the biopharmaceutical industry should view the future. The Pharmaceutical Research and Manufacturers of America's "Profile 2009" cites the value that the biopharmaceutical industry provides even during these challenging times.⁴ The value for patients is better health and a longer, more pleasant life with a reduction of chronic illnesses. Innovation drives the industry's value to the economy, where it provides jobs.

Clearly, the biopharmaceutical industry is clamoring for its stakeholders to open their minds to the new focus on staying connected. A variety of new tools and systems have great potential for speeding up clinical development timelines and bringing better products to market more quickly. The same tools and systems can provide a better platform for patient safety. They can communicate methods to accurately monitor effective use of their medicines and devices by instantly transmitting information about them to healthcare professionals, who can then be in a better position to manage the patients they serve.

Telephone-Based Technologies

Barbara Rapchak, the founder of Leap of Faith Technologies, recently described how technology can improve compliance and quality of life for cancer patients. She wrote, "Emerging cell-phone-based telemonitoring technology has the potential to enhance medication compliance in oncology and clinical trials."⁵ Her article showed how the use of

mobile technology, radiofrequency identification, and healthcare informatics has provided solutions for capturing field data "in order for clinicians to take action based upon hard data: field intelligence. In this case medication data are collected wirelessly by phone and help to verify that the patient is taking the drug at the right time while monitoring adverse events."

Bill Byrom's white paper on the use of IVR systems in Crohn's disease studies introduced a new use for IVR. Typically applied to the management of study drug randomization and 24-hour code break, IVR now is used as a system for collecting real-time patient-recorded data that play a role in calculating the Crohn's Disease Activity Index, the primary efficacy endpoint standard for studies in patients with the disease.⁶ The data can be integrated into an EDC system that also contains the laboratory results and clinical assessments that factor into calculating the index.

PDA-Based Technologies

More recently, ePRO companies have been touting the use of their handheld devices, tablets, and netbooks as the most effective way to collect real-time patient-reported outcomes. Sponsors increasingly use ePRO in their clinical trials to provide evidence that their products help to improve quality of life and to keep study participants compliant with protocol requirements. As situations in which trial activities are spread across several continents make wireless technology more of a necessity than a mere convenience, ePRO technology can help to keep data flowing from far-flung sites on a round-the-clock basis.

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Rachael King, the chief executive officer of CRF Health, showed that compliance is three times as great when patients use electronic diaries as when they use paper diaries. She further stated that the Food and Drug Administration's (FDA's) ALCOA (Attributable, Legible, Contemporaneous, Original, Accurate) criteria for patient data in labeling claims "have helped to substantiate the argument for using ePRO, as patient data are far more accurate when collected electronically."⁷

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In its response to the FDA's Guidance for the use of PRO, the International Society for Pharmacoeconomics and Outcomes Research stated that it "applauds the FDA's definition of 'treatment benefit' as 'An improvement in how a patient survives, feels, or functions as a result of treatment.'" This focus will provide a balance between the traditional biologic and physiologic markers and outcomes that directly measure impact to the patient, as reported by the patient.⁸

The combination of paper and technology is a step toward a more comprehensive assessment of patient response to treatment delivered and analyzed in real time.

Creative Patient Recruitment

Some clinical research coordinators and subject recruitment companies have created groups on Facebook and Yahoo! as a means to recruit potential

study subjects. They carefully craft messages about the kinds of patients they are seeking for the studies they are conducting. Some have sent Twitter one-liners to their network of colleagues about upcoming clinical studies, being very careful to keep the information generic so as not to compromise confidentiality.

Then there are the craigslist service and clinical trial centers, where information about studies is posted under “Jobs.” In today’s challenging economic environment, many people looking for jobs in the healthcare section instead find something that reads like this:

Are you a current or Past SMOKER for 10 or more years? Do you COUGH? Have you been diagnosed with BRONCHITIS? Or ASTHMA? Or COPD? If you answered YES to all of the above questions and you are age 40 or OLDER, then you may be eligible to participate in one of our research studies. You will have free medication, free physical exams, and you will be paid for your time. If you are interested, please fill out our registration form at XXXXX.

The Power of the Internet

Until recently, no one imagined that the Internet would be as influential on clinical research as it has become. Potential study participants are more informed because of the Internet. Most of the information that is made available on the Internet about diseases, medication, clinical trials, and news about the biopharmaceutical industry is helpful and informative. Unfortunately, every person has a different take depending upon the way he or she digests information. That can either propel people toward a better understanding of the disease or turn them off when the lack of guidance makes them fearful. The bottom line is that the Internet has the power to change the way that people think, feel, and eventually act.

The Crystal Ball

Looking toward the future, the biopharmaceutical industry’s employers,

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employees, investors, and regulators all have a duty to the general public to stay coordinated with each other in the way they manage healthcare. Realigning and restoring the public’s trust is one thing; fixing the public’s attitude toward technology is another. Industry stakeholders need to adjust and readjust continually to changing public perceptions regarding their activities. Such adjustments can be helped along by the activities of the Clinical Trials Transformation Initiative (CTTI), a collaborative effort of the FDA, Duke University, and representatives of various members of the clinical research enterprise, among other public-private projects seeking to realign and restore the public’s trust and attitude toward the biopharmaceutical industry.

When one looks at the different ways and forms in which technology has infiltrated the biopharmaceutical world, one can see the need to create measures to standardize the use of technology. The industry needs systems that can distinguish the technologies that are “nice to have” from those that are “must haves.” That distinction is even more urgent today, when the global economy is severely challenged and governments and society are taking a long time to recover.

Cost containment, risk aversion, and recycling are today’s bywords. Innovation has been temporarily compromised, awaiting signs that global economics are beginning to stabilize. Companies are scaling back; new molecular entities are few; patents are running out; and generics are “looming larger than ever.”⁹ Emerging mar-

kets increasingly promote themselves as the go-to areas for conducting clinical trials. “Virtual offices” are fast becoming the norm for companies large and small, giving technology an even bigger boost during this era of transformation.

Therefore, all people involved with the biopharmaceutical industry need to position themselves to face a future that will insist on connectivity as the Number One priority. Ideally, with real-time information gathered and transmitted instantaneously, products more quickly accessible, and long-term safety and efficacy tracked more stringently, the general public will be reassured that the healthcare products they consume have been tested thoroughly and that their quality has been assured, not only by the regulatory agencies, but by the solid experience and know-how of the industry that created them.

The success of the Internet, social networking engines, handheld devices, 4G cellphones, text-messaging services, and ever more portable computers are all factors to which the biopharmaceutical industry must pay attention. Only then can the industry use the latest technological advances to improve the way it conducts its healthcare business.

The industry should not only recruit bright, talented individuals; it should reconfigure the way it uses its resources to develop new products and conduct clinical trials. Learning about—and from—innovative technologies and using them responsibly must be the basis for improving the systems used in managing product development and conducting clinical studies. It is not only industry sectors

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that need to keep up with technological advances; regulators, too, need to think outside the box and move out of their comfort zones to stay in tune with the tides of change.

The people behind the CTTI¹⁰ are poised to achieve these goals, and stakeholders should be supportive and cooperative. The public must be kept informed. Relationships among the stakeholders of the clinical trial enterprise can be invigorated by using various types of technology to be more inclusive of each other's needs, rather than being elitist and exclusive.

Continual dialogue and open communication—along with due diligence, accountability, and transparency—must be the common ground on which stakeholders lay their claims. Then, even if tweets and blogs turn out to be the best and fastest way to transmit information to the public, its members can trust that the information they receive from the biopharmaceutical industry is based on substantiated evidence of safety and efficacy.

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