

APPLIED CLINICAL TRIALS

Virtual Clinical Trials: The Future of Patient Engagement?

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Imagine it's 2025. Participating in a clinical trial does not require travel to a clinical research facility or doctor's office. Your mobile device (maybe a phone, watch, or even your glasses) is your link to the clinical research study and how you report general information and adverse events. Wearable sensors record data such as body temperature and blood glucose levels, which are sent automatically to the study electronic data capture (EDC) record. The study personnel visit you at home for drug administration and follow-up. When a visit is approaching, your mobile device provides automated reminders, allowing you to reschedule the appointment within a time frame permitted by the study protocol. And that's just the beginning of what the future is likely to hold for so-called virtual clinical trials.

Virtual clinical trials represent a relatively new method of collecting safety and efficacy data from clinical trial participants, from study start-up through execution to follow-up. These trials take full advantage of technologies (apps, monitoring devices, etc.) and online social engagement platforms to conduct each stage of the clinical trial from the comfort of the patients home—including recruitment, informed consent, patient counseling, through to measuring clinical endpoints and adverse reactions. By relying on electronic processes, many argue that virtually conducted clinical trials offer opportunities for a more patient-centered approach.

Benefits of Virtual Trials

There are a number of advantages that virtual trials have over the traditional model, which uses multiple study sites and requires multiple patient visits to the site in order to conduct the study protocol. The most obvious advantage is that the virtual trial design maximizes patient availability and enrollment in the study. Patient recruitment and enrollment is often the longest stage of a clinical trial with almost 80% of trials failing to meet initial targets.¹ Unlike site-based clinical trials, which require frequent visits to a designated research facility, remote clinical trials are based from the patient's home so those with mobility issues—such as the elderly or patients who live in rural areas—are also able to participate in the trial. The convenience of a virtual methodology alone will increase numbers of patients willing and able to enroll. Also, electronic health records can help identify increasingly targeted trial subjects and online patient support networks which could be used more to raise awareness of trials and directly recruit subjects. While virtual trials still require the study site to house support staff and invest in data collection and analysis platforms, they are potentially significantly more cost effective because they don't require the traditional brick-and-mortar set-up of multiple study sites.

Another advantage to virtual trials is their potential to keep subjects engaged with the study. As many as 40% of Phase III trial subjects become disengaged and drop out of the study.² Some of the causes of this attrition are related to convenience—due to issues like the inconvenience of traveling to study sites, or the complexity of the trial design and data collection. Virtual clinical trials could remove the need for frequent travel to study sites and automate data collection, increasing patient engagement and retention. Virtual trials also offer the ability to reduce risk in the drug development process. Data from remote monitoring devices could be accessed by trial investigators in real time, opening up possible efficiencies in data cleaning, which could move to an on-going process rather than cyclical. Remote monitoring capabilities could thus facilitate an adaptive clinical trial approach, allowing improvements in trial design based on the accumulating data. Decisions to terminate a drug's development could also be made faster, improving patient safety and reducing expenditure on failed trials that have unfortunately become the norm in the drug discovery process.

Finally, the virtual trial design may allow groups who have a vested interest in the success of the trial (including investors, physicians, government agencies, patient advocacy groups and even the patients themselves) to have more opportunities to play an active role in the study, potentially leading to better data quality and shorter timelines.

Early Pioneers in Virtual Trials

In 2011, Pfizer pioneered the virtual clinical trial model with its Research On Electronic Monitoring of Overactive Bladder Treatment Experience (REMOTE) trial.³ The REMOTE trial was the first randomized clinical trial using web- and smartphone-based patient recruitment, enrollment and collection of study data without requiring patients to visit a physical study site. One of the main goals was to compare the virtual approach to a conventional Phase IV clinical study in order to determine if the virtual trial design would be a feasible way to conduct future trials. Unfortunately, Pfizer's REMOTE trial faced a host of challenges, not least of which was the issue of patient recruitment (most members of the target patient group were older, so the use of a technology-based trial was an unknown.)

Early this year, Sanofi announced its intention to support a virtual diabetes trial (VERKKO) to be conducted remotely in Europe.⁴ This virtual clinical trial has one key difference compared to Pfizer's REMOTE study in that no drug is being tested. Instead, Sanofi has teamed up with three other organizations to test a 3G-capable, wireless glucose meter. This trial represents significant advancement in the clinical trial community, as it is the first clinical trial using an electronic informed consent approved by European regulatory agencies.

What Does the FDA Say?

Though the FDA has stated that they see benefits in the appropriate use of technology in clinical trials, they are still in the process of learning about virtual clinical trials, the bring-your-own-device (BYOD) model of provisioning and other aspects of today's tech-enabled research environment.⁵ A docket has been established to gather feedback on how researchers are using technology and what barriers are stopping more widespread adoption.⁶ The agency is seeking input on four specific issues:

- How the FDA could encourage adoption of such tools.
- What barriers are seen as blocking uptake today.
- How new models of research will affect patients.
- Whether the need to comply with regulatory requirements is seen as an impediment to the application of virtual technology in trials, as well as whether gaining clearance from institutional review boards is an issue.

The fact that the FDA is seeking input is no surprise, as it is part of the FDA's role to support, and even encourage, innovation. In fact, the FDA's recently published new draft guidance document "Use of Electronic Informed Consent in Clinical Investigations"⁷ explains how federal regulators will permit companies to use electronic media (like interactive websites) to help facilitate the informed consent process. This will certainly serve to help companies conduct virtual clinical trials. Most companies are finding the FDA to be very supportive of virtual trials. Transparency Life Sciences, a Boston-based biotechnology startup, for example, recently secured FDA approval for an entirely tele-monitored trial protocol in a mere 30 days, and was encouraged to do more innovation in the direction of virtual trials.

Looking Ahead

The Pfizer case study and FDA docket suggest a multitude of challenges to come in the journey to make virtual clinical trials a viable choice for study sponsors. The new reality will require thinking differently about patient privacy and protection, as potential concerns about the inadvertent disclosure of patient data are likely to increase with virtual data collection practices. As the Pfizer study suggests, recruitment and retention of patients with low computer literacy is a major concern that can greatly impact the trial and data that it generates. In some study populations, this will likely present significant risks that call for careful monitoring and thoughtful mitigation strategies.

Looking to the future, several scenarios seem plausible. Perhaps virtual studies will augment rather than replace traditional study practices and workflows. Virtualizing aspects of the study may be leveraged when the circumstances call for it—similar to how remote monitoring workflows are being adopted by study oversight teams today. On-site monitoring is still a mainstay of the study, for example, but much of the data is monitored remotely, as appropriate. Or perhaps virtual clinical trials are used in rescue studies, where traditional models have failed (e.g., for geographically dispersed groups or rare disease populations). Interestingly, the Sanofi VERKKO study does not test a drug but instead focuses on a wireless glucose meter. Perhaps virtual studies will lend themselves well to sensors and diagnostics, which will continue to increase in importance as the technology evolves. And hybrid models are likely to emerge as sponsors increasingly step forward to test the new model. As Pfizer's experience shows us, it is not an easy road, but it is one likely to offer significant benefits for certain studies and select patient populations.

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