The Intersection of Decentralized Trials and the Central Lab: Direct-to-Patient and Direct-from-Patient Shipments

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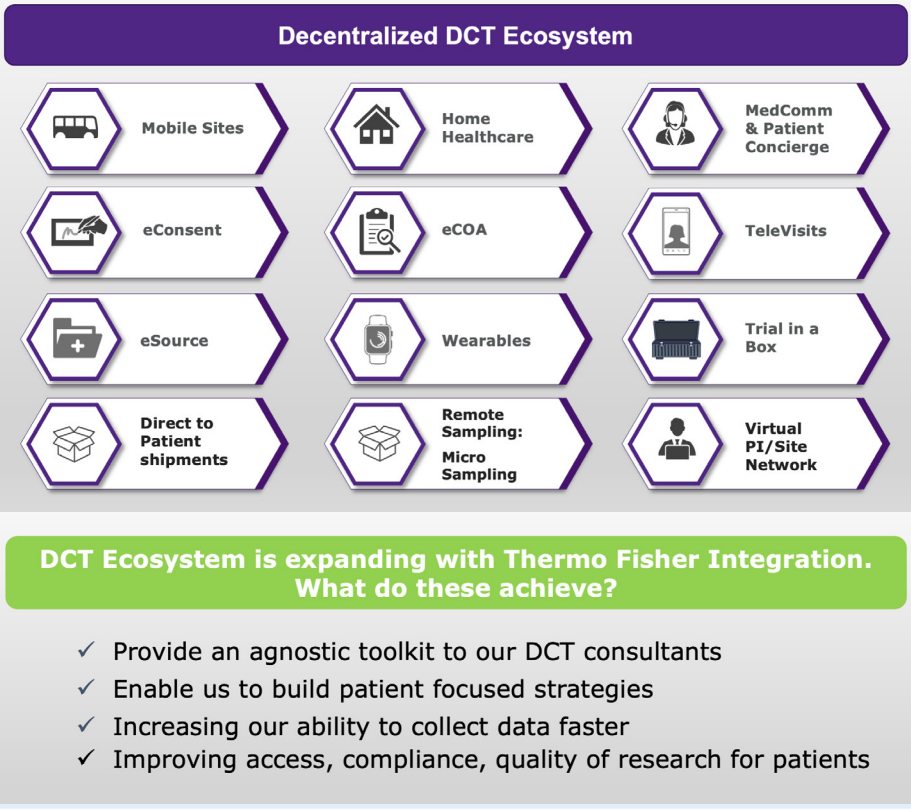
Decentralized clinical trials have emerged as an important tool for improving drug research and development. By not limiting patients to strictly on-site interactions, decentralization has the potential to expand patient access, accelerate recruitment, improve compliance, reduce drop-out rates, and more. But when trials have all or nearly all virtual protocols, how can sponsors ensure clinical materials get to patients on time, and that samples are returned promptly to the laboratory?

EXPANDING ECOSYSTEMS FOR DECENTRALIZED CLINICAL TRIALS

Decentralized clinical trials can take various shapes and sizes, and models sometimes overlap. Decentralized trials generally fall into three buckets:

- With the ***traditional model***, patients mainly go into the clinic to complete protocol procedures such as blood draws. These trials can be supported with technology. Since seven in 10 study participants live more than two hours from the nearest traditional study site,[1] this model poses challenges for patient recruitment, compliance, and retention.
- In ***fully decentralized (or virtual) models***, protocols are executed remotely, without any interactions at physical sites. Patients self-administer drugs, complete self-assessments, use wearable devices, and see clinicians through telemedicine visits. Sometimes, nurses visit a patient's home to complete protocol procedures. Patients might go to a local hospital for specialty procedures.
- ***Hybrid trials*** are a mix of the two above mentioned models. Some in-person site visits are planned, but much of these trials is completed remotely. This model has seen the most intense growth in recent years. Some clinical sites that previously only offered on-site services are adding remote capabilities to support this model. As such, progressive contract research organizations (CROs) are evolving in tandem to provide support to these sites with certification and training programs.

FIGURE 1: To achieve decentralization, numerous tools and a DCT ecosystem are evolving.



Numerous tools can be used to build and execute a patient-focused decentralized trial. CROs have begun creating ecosystems to support decentralized trials with advanced technology solutions, tools for operational strategies, and capabilities that draw on healthcare and community infrastructure (**FIGURE 1**).

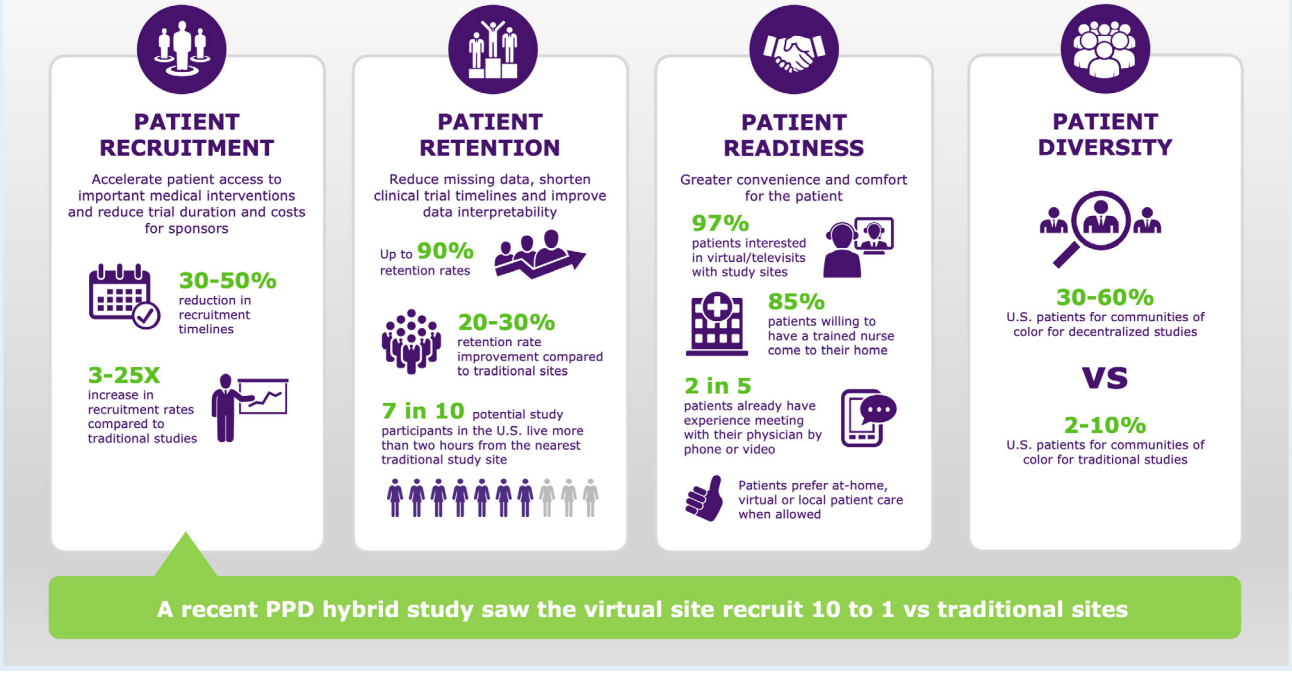
As demonstrated in **FIGURE 2**, these tools aim to reduce patients' burden for participation, which drives multiple benefits. Hybrid and virtual trials have the potential to:

- ***Accelerate patient access*** to medical interventions by compressing recruitment timelines by 30-50%.[2,3] In turn, trial length and costs are reduced.
- ***Increase patient retention rates*** by as much as 90% over traditional trials,[4,5] which reduces the chance of missing data and elongating clinical trials.
- ***Increase convenience and comfort for patients***. Nearly all patients (97%) prefer virtual visits with study sites and are willing to have a nurse come to their homes for treatments and sample collection (85%).[5]
- ***Include more diverse patient populations***. Recruitment can include patients from all communities, not just those who live near (or have the means to travel to) a physical study site.[1]

Underlying this structure are effective direct-to-patient and direct-from-patient shipment strategies and capabilities. This means shipments are sent to patients' homes, samples are collected remotely, and they can be returned quickly and conveniently. These components are essential for reducing patient burden and help ensure that sponsors collect the data they need.

The following examples are two scenarios for how this can be accomplished.

FIGURE 2: Advantages of decentralizing clinical studies.



Example 1: Rapid start-up. A team of decentralized trial consultants from a major CRO designed a virtual study for a client that required a rapid screening period. If it had been a traditional trial, time would have been spent on screening each patient in person, group randomization, and additional meetings with patients to distribute supplies for the trial.

To achieve the necessary timelines and recruit patients from a broader network, the client opted for a virtual model. This created the challenge of getting all lab kits and the investigational drug product to patients within a tight screening and randomization window. The CRO used its shipping and logistics expertise to address this challenge by sending shipments directly to patients' homes in consolidated packages—essentially creating a trial in a box.

This timesaving measure helped the virtual model accelerate start-up timelines by 10:1, more than what's typically seen using a traditional model.

Example 2: Adaptable and patient-centric sample collection. When studying therapeutics for rare diseases, every data point is critical. In one clinical trial, the same CRO mentioned in the first example went to great lengths to ensure that data could be collected from every patient.

In this example, the virtual trial protocol involved at-home nurse visits for sample collection. Nearly all participants were comfortable with this approach. Only one patient alerted the principal investigator that they did not want a nurse to enter their home. Rather than lose out on data from this patient, the laboratory utilized a mobile site. This flexible "site on wheels" traveled to the patient so sample collection could happen near, but not inside, the home.

Interest in dynamic protocols such as this has grown in recent years for good reason. This adaptable approach gives the principal investigator and the patient some flexibility within established protocols. If a patient wants to see a physician face-to-face, or have samples collected on-site, they can do so. And if they prefer an at-home nurse visit for sample collection,

that can be arranged. These options can all be included as allowable activities within the prewritten protocol.

By increasing options and creating dynamic solutions, results can be collected quicker while decreasing participation burdens.

SPECIAL CONSIDERATIONS FOR DIRECT-TO-PATIENT AND DIRECT-FROM-PATIENT SHIPMENTS

Ancillary supplies and lab kits for sample collection are essentially the same, regardless of whether they are collected by sites or by patients. Nonetheless, there are some special considerations for laboratories receiving samples from virtual trials.

- ***Collection technique*:** Will direct-from-patient samples involve blood microsampling? Or, will a home healthcare person collect those samples with traditional methods? And, can samples be sent back to the laboratory through regular couriers that are easy to access?
- ***Patient confidentiality*:** Blinded outbound logistics must be carried out with care. When returning samples to the lab, an intermediary database housing patient information should serve as a firewall between the lab and study participants to maintain confidentiality.
- ***Sample type*:** Sample type (e.g., saliva, urine, feces, and blood) can add complexity to sampling protocols. For instance, blood samples should be processed promptly. With direct-from-patient shipments, it must be carefully determined how to send samples to the lab, so they are stable. Possible ways to address this issue include using a mobile lab unit. By doing so, samples can be stabilized immediately. A home health nurse may also collect samples and spin them immediately.

Partnering with a knowledgeable CRO that can offer options, guidance, and expertise can help site sponsors ensure the receipt of stable samples and overcome many challenges associated with clinical trials.

EVOLUTION OF DECENTRALIZED TRIALS

The evolution of decentralized trials has ushered in some changes in the CRO space. End-to-end providers aim to serve the entire clinical research continuum, which has seen some expansion with decentralization. For instance, experts are seeing decentralization used in early-phase studies, well before typical Phase 2 and 3 activities.

In addition, end-to-end providers are seeing additional opportunities to combine decentralization strategies with logistics expertise as they work to make direct-to-patient and direct-from-patient shipments as efficient as possible, especially when international participants are involved. For instance, the logistics of temperature-controlled shipments for dispersed populations must be carefully planned. And, decentralized clinical trial rules that differ among regulators worldwide must be considered. As global researchers, experienced CROs consider these country-specific process requirements and differing cultural expectations when designing global studies.

As sponsors continue to move toward hybrid and decentralized trials, strong CRO partnerships are essential. Organizations that link clinical labs, logistics, and technological capabilities are well-positioned to give all stakeholders—sponsors, patients, and investigators—a seamless experience during the collection of important data.

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