Technologies, tools and processes to support patient-centric oncology trials

There is a gap between the number of patients needed to participate in new cancer trials and the number who give consent to take part. Decentralized clinical trials (DCTs) are helping to address this gap by increasing the reach of clinical studies beyond conventional research sites. DCTs provide an opportunity to remove some of the burdens associated with in-clinic visits, allowing participants to take part in trials from their own homes and/or community healthcare setting, with fewer visits to a hospital/trial site. Key to the delivery of DCTs is a suite of tools and technologies that support near real-time review of clinical data from multiple sources. This article looks at some of the technologies, tools and processes that can support more patient-centric oncology trials.

The challenge of conducting oncology trials

A search of clinicaltrials.gov shows that there some 87,000 oncology trials recruiting patients at any one time. Yet fewer than 1 in 20 adult cancer patients take part in clinical trials,[1] and many oncology trials fail to meet their recruitment targets.[2] This imbalance in supply and demand of patient participants makes trial recruitment and retention a significant challenge that takes up considerable time and resources for sponsors and study teams alike.

One of the drivers of the low recruitment and retention rates for clinical trials is the burden that trial participation places on patients. Trials often require patients to travel frequently to hospitals, presenting barriers both in terms of whether patients are well enough to travel and the time and cost of attending such frequent appointments.

This is particularly true of oncology trials, which are often complex studies requiring collection of a diverse range of patient data at frequent intervals – from scans to blood tests, to vital signs and symptoms. Traditionally, oncology trials needed to be carried out at specialized hospital sites, which meant that the trials (and access to innovative medicines or tests) were out of reach for many patients.

Decentralized clinical trials (DCTs) – also known as direct-to-patient, hybrid, remote or virtual clinical trials – provide an alternative option for delivering oncology trials. Participants can take part from their home and data can be collected at locations other than the traditional clinical research site. The multidisciplinary nature and complexity of oncology trials, along with the need for frequent assessments, mean a hybrid trial design is often more appropriate. In the hybrid model, patients still travel to the clinical research site for some aspects of their care, such as a scan, but can have other monitoring and tests carried out at home.

DCTs or hybrid trials therefore offer the potential to make oncology trials more patient-centric, by making participation less burdensome and reducing the impact or disruption of the study on patients' day-to-day lives. In turn, this can help boost patient recruitment and engagement, facilitating retention of patients and collection of high-quality trial data all the way through to follow-up. This ultimately reduces costs and improves trial efficiency and accuracy for sponsors.

How DCTs can work in oncology

DCTs allow data collection at locations other than a clinical study site. This is underpinned by digitally connected tools such as wearable devices or home monitors (e.g., ECG, temperature monitors), and electronic patient-reported outcome (ePRO) tools to record symptoms and adverse events. It also requires bespoke remote services such as telemedicine, direct-to-home supply and sampling, and nursing provided at home or through satellite facilities.

To coordinate the use of all these new tools, technologies and processes, DCTs also require new ways of working and new expectations of patients, site teams and remote-based healthcare professionals. Although patients may recognize the convenience that DCT components offer in facilitating their participation in a trial, they may also experience psychological and emotional barriers when it comes to swapping face-to-face clinic touchpoints with interacting with their doctor via a mobile device or website.

These new ways of working and expectations necessitate much closer collaboration between the trial sponsor and site study team to ensure adequate support and training for staff and trial participants alike. Site teams and sponsors need to be able to quickly identify any issues at the individual patient level and across the trial, ensuring that patients comply with treatment and are comfortable using DCT tools. These measures not only ensure that data is collected correctly, and that patient monitoring runs smoothly wherever it is carried out, but they lead to a positive experience for participants – right through to entry of the last data point.

Setting up DCT components to facilitate patient centricity

One of the key benefits of deploying tools used to enable DCTs (e.g., connected devices) is the ability to achieve near real-time oversight of trial data at an individual patient level. These technologies can allow events or deviations to be picked up early, and this can benefit the patient as well as the study team and sponsor.

Given all the individual tools and processes involved in a DCT – and the complex and varied design of different oncology studies – each study needs a tailored strategy to be built between different project team functions. A critical component of this strategy is to develop an appropriate technological solution for the flow, collection and interpretation of data. This ensures that all key data can be brought together using centralized review and reporting technologies, and that it can be easily accessed reviewed, and acted on in a timely way by different stakeholders.

With DCT technologies, real-time data flows from multiple sources, leading to a continuous clinical data flow that increases real-time data access and review as well as improves efficiency in monitoring safety and performing clinical oversight. To realize the potential of this continuous data flow, you need a robust digital platform that can integrate data from all sources [e.g., electronic data capture (EDC) database, patient ePRO, televisits and connected devices]. The configuration of this should be defined by the unique data flow pathways of each study and the desired levels of monitoring required by the study investigators and sponsor.

The digital trials platform used by Labcorp Drug Development for DCT is based on technology it acquired in 2020 from SnapIoT, a no-code, drag-and-drop platform of highly tailored, internationally compliant clinical applications than can be set up within weeks. Used together with Labcorp's proprietary Xcellerate® Medical Review tool, this enables real-time oversight of pivotal participant-level trial data, ensuring that decisions can be made for each individual patient on a near real-time basis even if they do not set foot in a bricks-and-mortar clinic.

Tracking safety and efficacy for individual patients

In a DCT data flow architecture, the sponsor works with the Data Management team, Project Management team, Medical Monitor and Medical Data Reviewers (MDR) to agree on the critical safety and efficacy variables for the trial, and how often these should be reviewed, for each individual study. The Medical Data Reviewers are familiar with and experienced in handling data from various sources that will be integrated with the Xcellerate Medical Review or any other customer informatics tools or through direct EDC reviews.

The Medical Data review with the oversight of the Medical Monitor carries out the Central Medical Review (CMR) process, which consists of the comprehensive cleaning of data in multiple tiers, starting from the patient's first visit when the site enters data into an EDC database. As an integral part of the clinical and medical oversight process, the medical review process allows physicians and the MDR to assess clinical issues and the safety of each patient and pay special attention to patient eligibility and reasons why patients might need to discontinue the trial.

The Xcellerate Medical Review tool can systematically and quickly survey patient data, visualize patterns and outliers and (through our state-of-the-art clinical data warehouse) provides integrated access to all patient data from any source. It allows clinical and safety teams to look for issues across the entire study, and drill down to individual patient-level data, to be able to view patient profiles and their journey as they progress through the trial.

The CMR process happens at two levels:

- Holistic patient review provides near real-time insights on individual participants, providing early detection of safety issues and protocol deviation and the ability to promptly manage patient risks.
- Aggregate medical review is the frequency-based review of clinical data across participants, sites and countries to identify critical trends and data inconsistencies that may impact study reliability.

This holistic patient review process facilitates true patient-centricity: the MDR reviews the critical data of each individual participant based on each visit. This includes carrying out an eligibility review to ensure that only eligible patients are randomized. The MDR examines all laboratory test parameters and identify potentially significant lab outliers that could affect subject safety, such as anomalies in liver function tests. They also conduct a safety review of all adverse events and serious adverse events and flag any abnormalities from physical exams or medical history, and other parameters (e.g., vital signs, ECGs) that provide indicators of patient safety and suitability for continuing on the trial. Medications are reviewed for appropriateness and dosage, and any prohibited medications are immediately flagged to the Medical Monitor.

Medical Data Reviewers work very closely with the Medical Monitors to ensure regular updates on eligibility, safety and efficacy. These can be carried out as often as weekly depending on the trial requirements, and are facilitated by cooperation and clear communication pathways between these groups. Together, this helps to ensure participants adhere to the protocol and receive the treatment as they should and quickly identifies and mitigates safety issues.

By facilitating early detection of critical safety and efficacy signals, and the ability to rapidly escalate and remediate findings, it becomes possible to detect and mitigate participant-related issues before the patient is next seen in person onsite or at a remote visit, ensuring that patients are supported in a timely, tailored and patient-centric way.

Patient-centricity – and patient equity – in action

One of the benefits that can be realized from DCT in oncology trials is the potential to include more eligible patients regardless of their location and where personal circumstances would not otherwise enable them to take part in a trial. However, patient circumstances can change rapidly, and if patients change their medications or develop a new coincident condition then it is essential to know this.

In a conventional trial, study teams may have to wait until the next clinic visit to find out whether a patient's eligibility has changed. This can potentially put patients at risk of adverse events and/or contributes to unusable data being collected for the study. An important advantage of DCT trial technologies is the potential for sponsors and study teams to monitor patient eligibility more easily and closely. This can be done through the real-time monitoring technologies many DCTs use, but also through the CMR process.

For example, in a Phase II study for metastatic melanoma, when the CMR team performed an ongoing review of eligibility data they identified more than 100 issues. Determining which issues were truly affecting eligibility allowed them to identify deviations in 15% of the study participants. This identified patients who were not meeting inclusion criteria and should be discontinued from the trial.

Importantly, for patients, these reviews can help identify patients who might have issues that were not picked up by eligibility screens, and who therefore should not be receiving the experimental treatment. This includes the presence of underlying infections or long-term conditions such as undiagnosed cardiovascular disease. This illustrates how the technologies that support DCTs allow events or deviations to be picked up early and that this can benefit the patient as well as the study team and sponsor.

Conclusion

DCTs or hybrid clinical trials can provide a more patient-centric and efficient option for delivering oncology studies. The key enablers of the DCT model are the tools, technologies and processes that underpin data collection and flow from remote locations through to a centralized platform. At the heart of this data flow architecture is the MDR team, which comprehensively cleans, reviews and reports on the key data insights of the trial at a patient-, site- and country-level. This is a key enabler of the DCT model, which enables the early detection of issues related to eligibility, safety and efficacy.

The real-time nature and frequency of data signals generated from the technologies used to enable DCTs can make it easier to detect changes in patient behavior and status. This maximizes the opportunity to boost engagement, ensure protocol compliance and retain participants with high-quality data through to the study end.

Put simply, the technologies, tools and processes that support DCTs allow events or deviations to be picked up early, which can benefit individual patients as well as the study team and sponsor.

References

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