Innovation in Paediatric Trials: Conducting Study Visits at Home

Clinical trials regularly struggle with adherence and recruitment, especially those involving children. However, decentralising clinical trials and incorporating more home-care could help solve these problems

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Patient participation in paediatric clinical trials involves the entire family, which presents unique challenges for both subjects and researchers. Logistical challenges on the family, such as transportation, childcare for other children, and balancing the substantial commitments of time and effort, often result in lengthy recruitment times and narrower patient populations for paediatric clinical trials. These same challenges also make evaluability, patient retention, and treatment compliance a struggle.

Fortunately, recent innovations in trial designs are addressing some of these barriers to recruitment and participation. Their new technologies and procedures help alleviate burdens for the subjects and their families without compromising the integrity of clinical trial procedures or the measurement of endpoints.

The Paediatric Patient Journey

To conceptualise the patient journey in the paediatric research space, imagine a parent of three children who agrees to have one child participate in a clinical trial. The challenges involved in simply getting to the clinic may mean excusing them from school, taking time off work, scheduling a babysitter for the other two children, or herding all three children into the car and finding ways to keep them entertained while at the clinic.

Families may also face additional challenges, such as changing or unstable housing, financial concerns, unreliable transportation, and changing phone numbers (1). These barriers and more can lead to poor treatment compliance or visit attendance during the course of the trial, or even to early withdrawal from the study.

In 2020 and now 2021, the COVID-19 pandemic has created additional challenges for clinical trials, especially in the paediatric realm. Families do not want to bring a child, often an ill or very young child, into the clinic and risk further exposure to the virus.

Innovations in Paediatric Trials

The best way to achieve greater participation and reduce the burden on families who participate in clinical trials is to assimilate the trial into their lifestyle. Innovative 'hybrid' and 'decentralised' trials substantially reduce the number of in-clinic visits and alleviate some of the logistical barriers parents face in getting to the clinic. Additionally, the use of mobile devices to capture near real-time trial data promotes better compliance, which leads to faster decision making and results in improved patient care. With new trial designs and technologies, the family benefits from ease of participation, and the trial benefits from increased compliance and higher-quality data.

Recruitment

One of the first effects of these novel trial designs is broader, faster recruitment. Many clinical trials suffer from low enrolment when

recruiting a specific population, and they may make concessions that limit the diversity of targeted populations to enrol within the study timeline (2). In decentralised trials, however, sponsors or CROs typically advertise through patient advocacy groups and various social media avenues to generate interest in the study among the relevant population. These advertisements can be sent to groups of national or even global membership, without the geographical restraint of a radius around a 'brick and mortar' site.

Hybrid and decentralised trials also appeal to the busy or cost-conscious parent. Parents who decline consent in a clinical trial often cite excessive frequency of study visits as one of the greatest barriers to participation, and those who do participate cite travelling to the clinic as one of the requirements that is most disruptive to their routine (3-5). It is far less disruptive to the day-to-day lives of the family if they only need to be seen at the beginning and end of the study, or if a visiting nurse will come to them whether at home, at school, or even at daycare.

Finally, recruiting agencies can tap into social media to better understand the patient population and generate interest in the clinical trial. Parents in this generation, and likely future generations, turn to social media for answers and advice, and a place to connect with others in a similar situation. Using this avenue to generate interest in the clinical trial, families get an idea before they even read a consent form whether it will be a good fit for their busy lives.

Retention

Once participating in the study, families benefit from the convenience of in-home visits, and researchers benefit from faster, more complete data collection with better quality. Everything from e-consent to procedures and assessments can be captured within the patient's home.

For many parents and/or adolescents, it will be second nature to capture study data using their personal device. For example, many of the mothers involved in infant formula trials already use apps to track feedings, wet diapers, and more, so at the very least, they will be familiar with the technology used for electronic patient-reported outcomes and direct data capture. The convenience of tracking data in real time also means parents or guardians will be less likely to forget and end up filling in a questionnaire from memory weeks later.

Use of a personal device may also benefit retention of adolescent populations, as a systematic review of clinical trials in youth with Type 2 diabetes noted, because they are the study population that tends to be least compliant with study treatment and visits (6). If adolescents are able to participate in a study from the convenience of their personal devices, and without leaving the comfort of their home or community, they may be more likely to participate in clinical trials and continue through the duration of the study. In addition, through use of home healthcare, visits can be conducted discreetly at the adolescent's school, reducing the burden of missing days to attend in-clinic visits. In an analysis of the challenges faced in clinical trials involving adolescents with cancer, researchers found that, "the acceptability of trial design in terms of disruption to 'everyday life' will influence [adolescent and young adult] decisions to take part" (7).

Whether it is the parents of an infant or an assenting adolescent, if it is easy to participate in a clinical trial, they will be more likely to complete the trial.

Better Data

Better data come from the real-time data capture capabilities of decentralised trials. Subjects track study activities on synced devices, and wearable technology sends data to study centres so that they can be reviewed almost instantaneously. These data are more accurate in terms of numbers, and more reflective of real life because they're recorded in the moment.

Furthermore, decentralised trials involve a home health nurse visiting the subject's home at regular intervals. While in the home, this nurse might notice environmental factors that could be pertinent to the study that investigators would have otherwise never known about. Subjects also behave differently in their own environment, which may contribute to more accurate study data than would be obtained in the unfamiliar (or even scary to a child) environment of a clinic or hospital.

The real-time, real-life data allow researchers to make decisions faster, to see if the subject is not compliant with treatment and protocol, and to promote accuracy (through immediacy of reporting or wearable technology) of reported outcomes.

Operationalising Decentralised Trials

Hybrid and/or decentralised trial design models are not one-size-fits-all. There are key operational considerations that need to be discussed when determining whether or not to incorporate in-home visits into the trial design.

First and foremost is the trial design itself. The protocol procedures need to be assessed to ensure all protocol requirements can be conducted in the patient's home setting. For example, is a home healthcare nurse qualified to perform all the procedures? Is additional training required? Is the right technology available? How will the investigator provide oversight during and/or following the visit?

Currently, a variety of wearable technology exists that aids in not only day-to-day data capture, but also

in facilitating virtual physical assessment. With physical attendance by a nurse, the use of connected devices to monitor vital signs, for example, and virtual attendance by the physician, the physician can be located anywhere and still examine the patient.

The second operational consideration is cost. There tends to be a misconception that decentralised trials will be cheaper than conventional trials; however, the true advantages of decentralised clinical trials are shorter recruitment timelines and improved patient experience leading to better, more accurate data. Decentralised clinical trials help save time, not money.

One of the increases in costs, and another operational consideration, is vendor management. In-home visits require more technologies and services than may be used in a conventional study, so decentralised trials require more vendors, such as home healthcare services, direct-to-subject shipping, mobile device technologies, electronic patient-reported outcomes, eConsent, and telehealth. This cost, however, may be offset by the reduction in investigator fees.

Lastly, finding, or even establishing, the right site(s) to coordinate the hybrid or decentralised trial is key. Investigators and site staff must be familiar with or willing to adopt new technology and processes. In addition, the use of digital tools may require modifications to existing policies (e.g., eConsent) or require new policies altogether.

Patient-Centric Paediatric Trials

These innovations driving hybrid and decentralised trials are a boon to paediatric research in terms of participation and retention, as well as patients in terms of satisfaction and quality of care. They bring the study into the family's life in a way that reduces barriers and burdens, allows a greater breadth of family participation, and reaches a larger patient population, while the near real-time data collection leads to improved data integrity and analysis of study endpoints. In the end, patients are happier and more involved, which means researchers get better data and longer, more reliable participation for their research study.

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