

Decentralised, patient-centric, site-less, virtual, and digital clinical trials? From confusion to consensus.

Acknowledgement & Disclaimer

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Original paper - [Decentralised, patient-centric, site-less, virtual, and digital clinical trials? From confusion to consensus](#)

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What is this article about?

Clinical trials are used for testing new medications to make sure they are safe and effective. They usually take place in a clinic or hospital (the study site), meaning the people who participate in the trial must be physically there. This can be inconvenient and expensive for all involved.

Lately, researchers have become interested in different approaches to make participation in clinical trials easier. One of these approaches is to organise trial activities in or close to the participants home.

With the help of technology these trials have become more common. There have been many different words and phrases used to describe these types of clinical trials. Some examples are 'virtual,' 'digital,' 'remote,' and 'decentralised.' People with different roles from different industries don't always use the same words in the same situations, which creates confusion and barriers for acceptability.

In this paper, the researchers looked at each of these words and then explain why they think 'decentralised clinical trial' is the best option.

Background Information

Clinical trials are needed to test new medical treatments, but they can be challenging. For example, participants in a typical clinical trial have to travel to the study site. For the people running these trials, it can be difficult to find enough people to participate and complete the clinical trial. Also, clinical trials can be very expensive to run.

These challenges can affect how well you can compare the results of the trial to how it works in real-world everyday practice. This is where technology can help. Phone or tablet apps, devices you can wear that collect information, and virtual doctors' appointments can all be used in clinical trials. This means people may not ever have to leave their homes to participate in a clinical trial.

Not only is this less of a hassle, but it also means people who live further away from a study site can participate in clinical trials, when they may not have been able to before. The more different kinds of people participating in a clinical trial, the better, because this means the results of the trial will be relevant to more people.

The COVID-19 pandemic had a big effect on the clinical research community. Like many other industries, the lockdowns forced them to change their way of doing things. Government agencies have a specific set of rules for how clinical trials should be run, but because of the lockdown they had to come up with different ones to make sure clinical trials could still go on as planned. For example, they gave instructions to study sites for how to electronically get participants' agreement to be included in clinical trials, how to ship the medications directly to the participants, and how to use virtual appointments. These new ways of working made it so that clinical trials could continue without the risk of spreading the virus.

With this new interest in changing the way clinical trials are done, there was an opportunity to further explore these alternative ways of doing clinical trials that centre the trial around the participant rather than a clinic or hospital.

There are many ways to talk about this way of doing a trial. Some people call them "site-less trials," while others use "digital trials," and others still might say "decentralised clinical trials." It seems like not everyone agrees on which terms should be used, and the same term can even be used to describe two different things. This makes it hard for different people to have discussions about these clinical trials, or for potential participants to find information about them and understand them. A good example of this is the phrase 'virtual clinical trial.' Some have used this phrase to describe clinical trials that use technology so that participants can have virtual visits, but others also use it to describe clinical trials using fully computer-simulated trials without any human participants.

This can lead to confusion for anyone who wants to learn more about these kinds of trials. So, the purpose of the research project described in this article was to look at these words and to define them. The researchers created a map of terms describing clinical trials that centre themselves around the participants and dove into the definitions other people have come up with. Then, they weighed the pros and cons of each of these words and looked for differences. They eventually came up with a single phrase they recommend using and explain why. Hopefully this will make it easier for people to talk about these clinical trials going forward.

What did the researchers do?

For this project, the researchers used a technique called a literature review. This means they used search engines to look through all relevant academic articles to get an idea of how researchers see this topic. In this case, they wanted to find research articles where they talked about these kinds of innovative clinical trials and see how the researchers used the words.

What did they use to search?

The main search engine they used was PubMed, or MEDLINE, which is similar to Google but only for health-related research. They chose which terms to search carefully, making sure to include as many synonyms as possible in both American and British English spelling. They wanted to cast the widest net possible. After they finished searching, they checked each article to see if it mentioned any other articles that might be relevant.

How many articles did they find?

After checking all 211 articles that came up during their search, the researchers saved only 26 for their project because the rest were not relevant to what they wanted to study. Some articles were excluded because they didn't talk about the right kind of trial, were off topic or did not have properly defined terms in them.

What did they do next?

The next task was to pull information from these 26 articles and analyse them. They documented the title of the article, the year it was published, the terms used to describe the way of doing the trial, and the definition provided. They also referenced any other articles the original authors mentioned.

What were the most common terms?

In these articles, the most common terms were:

- virtual clinical trial
- remote clinical trial
- decentralised clinical trial
- digital clinical trial

Some less common terms were:

- site-less clinical trial
- decentralised virtual clinical trial
- remote decentralized clinical trial
- patient centric trial
- internet-based trial
- web-based clinical trial

You can see the list of definitions the original authors of the articles provided for these terms in [Table 1](#).

Were there any patterns?

During their review, the researchers noticed that the terms seemed to fall into three different groups based on what was focused on:

1. Technology
2. Participant
3. Location

Terms focusing on technology

Internet-based clinical trial: The term ‘internet-based clinical trial’ is one of the oldest terms the researchers found in their review. It was defined for the first time in 2003. Later, some other researchers used another term – ‘online clinical trial’ – to discuss the potential of using the internet to conduct clinical trials. They also pointed out that there are many pros and cons to online clinical trials. They might be able to reduce the cost of clinical trials, but people who conduct them will need to pay extra attention to security risks. By 2011, the term ‘web-based clinical trial’ was used for the first time for a trial on overactive bladder treatment. In this trial, the participants used their mobile phones to report on the requested data rather than visiting a clinic or a hospital. The authors of this article also used the words ‘participatory patient-centred’ to describe the trial sometimes as well, but didn’t define this phrase.

Virtual clinical trial: The most common phrase was ‘virtual clinical trial,’ used in over one-third of the articles the researchers found in this review. However, many authors of articles that used this phrase also used the phrases ‘online medical research’ or ‘remote clinical

trials' in the same way. A virtual clinical trial as defined by these articles seems to be one that has very few visits to a clinic or a hospital, if any at all. Instead, these interactions take place virtually using technology. Collecting data and sending it is also done with technology. However, the phrase 'virtual clinical trial' seems to also often be used to refer to trials that are fully computer-simulated, without any human participants.

Digital clinical trial: Some articles used 'digital clinical trial' to describe using technology to improve different building blocks of a trial. But it was also used to describe clinical trials where some but perhaps not all of the clinical trial was done remotely or digitally.

Terms focusing on the participant

Patient-centric clinical trials: The idea of 'patient centricity' was defined in 2013. They defined it as a process where patients are the ones who control how information flows to and from them in a healthcare setting. This is important because different patients have different preferences, values, and beliefs, which can change how they might choose to receive or send information. Adopting patient centricity fully would dramatically change how and when healthcare decisions are made, and who gets to make them.

When it comes to clinical trials, patient centricity could mean a trial where every single part of it, from the design to the study measurements, are centred around the participant. However, it could also be about the day-to-day running of the trial. For example, in one article the authors described patient-centric clinical trials as clinical trials with open enrolment, fewer numbers of sites, management from one location, and data collection only through the study site.

Terms focusing on location

Site-less trial: An article from 2017 first used the term 'site-less trial.' The authors recommended having a system that can handle clinical trials where people can participate directly from their homes. For example, one where pharmacists and other healthcare professionals provide support and guidance by phone and video calls. Since this article, the term 'site-less trial' hasn't been used much except for a few opinion papers.

Fully remote decentralised trial: One of the first 'fully remote clinical trials' was conducted in 2014. The article describes how the researchers compared three different smartphone apps for depression management. There was very little contact with study staff in this trial.

Remote clinical trials: Another paper from 2018 talks about how 'remote clinical trials' done through nursing homes could be a good opportunity to use technology to bring the research to the patient. The term 'remote trials' has been used as well, with one definition provided: "trials (that) are led and coordinated by a local study team, but are based remotely, within a given community, state, or even nation." Most articles that use this term stressed using technology to achieve this. They also often used other terms just as often as 'remote trials' -

synonyms included ‘virtual clinical trials,’ ‘web-based trials,’ ‘mobile clinical trials,’ and ‘decentralised clinical trials.’

Decentralised clinical trial: Since 2018, the term ‘decentralised clinical trial’ has been widely used in research and government guidance documents. It has been defined as a trial design with a single study site managing patients within their usual environment through phone and video calls, technology and local healthcare providers.

Also in 2018, the [Clinical Trial Transformation](#) Initiative (CTTI) gave a similar definition: “those executed through telemedicine and mobile/local healthcare providers (HCPs), using procedures that vary from the traditional clinical trial model.” CTTI also pointed out that there could be trials with only some decentralised parts. These trials might still require some visits to a study site. They call these ‘partially decentralised’ or ‘hybrid’ trials, which should be considered different from decentralised clinical trials which are fully remote.

The definitions identified by the researchers emphasise the use of technology in clinical trials and that these types of trials are not limited by physical locations. This could lead to more diversity among the people who participate in clinical trials.

Remote decentralised clinical trial: The term ‘remote decentralised clinical trial’ was used by the Trials@Home consortium in 2019. They defined it as “clinical trials that make use of digital innovations and other related methods to make them more accessible to participants. By moving clinical trial activities to the participant’s home or to other local settings this minimises or eliminates physical visits to a clinical trial center.” They have also distinguished between hybrid clinical trials from fully remote trials.

Post publication note from the Layman team: Since 2019 the Trials@Home consortium moved away from the use of this term to just ‘Decentralised Clinical Trial’.

Decentralised virtual clinical trial: In 2021 a new term surfaced and was defined as follows: “Incorporate remote outcome assessments (remote data collection)” and “may accelerate clinical trials, increase adherence (following directions), reduce dropout rates, and bring new treatments to the market faster.”

Need for common terminology

There is a lot of variety in how people talk about clinical trials that are centred around participants. In this article, the researchers were able to identify these terms by reading through all the available articles on this topic.

They found that most of the definitions mentioned the advantages of using technology in a clinical trial. Many original authors pointed out in their definitions that using these technologies could make it more likely that participants sign up to be in the study, as well as

allowing data to be collected continuously instead of only at a study site and could be more convenient for participants.

The terms 'virtual,' 'digital,' and 'remote' are not quite the same, even though they are often used interchangeably in the articles the researchers reviewed. The differences can cause confusion. Also, many of these articles used one of these terms but did not give a definition, adding to the confusion.

Many different groups of people might use these words, including patients or trial participants, study doctors, funding organisations, and regulatory bodies. It's difficult to discuss a topic without having a common way of referring to it.

Disadvantages of each of the most common terms

Here, we will summarise the researchers' arguments against the three most common terms: 'remote,' 'virtual,' or 'decentralised' clinical trials.

Disadvantages of 'remote clinical trial': This term emphasises 'remoteness.' This means physically far from the study site. However, from a participant's point of view, these trials are not remote at all. In fact, the opposite is true, since the activities involved in the trial are less remote as far as the participant is concerned.

Disadvantages of 'virtual clinical trial': This term is used widely in the field to talk about the kind of trials we are concerned with in this article. However, it's also used to describe completely different types of studies that don't involve humans at all.

Disadvantages of 'decentralised clinical trial': This term is used quite widely, including by many health authorities. However, like 'remote' it does not clearly explain that the trial is designed to be easier for participants.

Agreeing on common definitions

There are some ideas that show up repeatedly in each of the different definitions the researchers identified, such as:

- Monitoring participants directly from their homes
- Use of technology
- Internet-based applications
- Participant convenience

Although none of the terms used are perfect, the researchers prefer '**decentralised clinical trial**' over any of the other options. This is because the most prominent part of the definition is about how the trials take place away from the clinical site, contrasting with traditional trials. On the other hand, 'patient-centric trial' makes it seem like the trial is designed with the

needs of the participant at the forefront. While a decentralised trial could be designed with the needs of participants in mind, a 'patient-centric trial' involves much more than just moving the activities of a trial to a more convenient location for the patient. Also, not every trial is conducted on patients. Some trials are conducted on healthy volunteers, who may not resonate with the term 'patient.'

Because 'decentralised clinical trials' (DCT) is used quite often, the researchers recommend that everyone starts to use this term to refer to the way of conducting clinical trials where the trial activities take place at, or in the vicinity of, the participant's home, rather than at a traditional clinical site. This might include using technology like telemedicine visits, health monitoring wearable devices, or other innovations like direct-to-patient shipping of medication, mobile healthcare providers, throughout the trial.

Using this approach might make people more likely to participate in a trial and to stay on it for the full period. It also removes the inconvenience of having to travel often.

It should be mentioned that DCTs don't necessarily mean you won't have to visit a study site at all. Researchers could use DCT approaches alongside traditional site visits for various reasons. Also, many traditional trials have some DCT elements already, mostly when it comes to collecting data outside the clinical site. Examples of how you might do this is through electronic diaries participants use to report data, or wearable devices like smartwatches.

You can think of it like a spectrum, with decentralised clinical trials on one side and traditional trials on the other. In a DCT, no physical visits to a site are required, while in a traditional clinical trial, most or all activities take place at a site. Overall, the trend in all clinical trials is moving towards the DCT side.

Technological advancement has changed the way we conduct clinical trials. While 'decentralised clinical trial' might not be a perfect term to capture this, and could change in the future, reaching agreement on its use and understanding its meaning will help people understand this topic better in the future.

Conclusion

The researchers analysed several academic sources talking about clinical trials that make use of different approaches that help bring the researcher closer to the participants. They noticed that there are many different terms used to describe these types of trials, making it more difficult to have important conversations about them. They recommend that other researchers, people who conduct clinical trials, and other people interested in this topic all use the same term. They suggest 'decentralised clinical trials' or DCTs for this type of trial.