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# New Horizons in Clinical Cancer Research

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## Introduction

Clinical trials are the final link in the chain of knowledge and are used to figure out the roles that therapeutic advancements play. Unfortunately, they are the weakest link in a significant sense. This article discusses two designs that are currently being investigated: basket trials and platform trials. Both are making an effort to combine clinical practice and clinical research. Cancer can be dissected through the use of molecular biomarkers. Biologists are discovering how biomarker profiles interact with therapy and cracking cancer codes at an unprecedented rate. However, historians of the future will view cancer biology as still in its infancy. The unknown is larger than the known. The final link in the chain of knowledge and for determining the roles of therapeutic advancements are clinical trials. Unfortunately, they are the weakest link in a significant sense. Furthermore as biology progresses, conventional clinical trials will become increasingly restrictive. That spearheading accomplishment diverted medication from account and contextual investigation into authentic science. In the past seventy years, RCTs have not changed much. Modern biology's rocket ships, extending the analogy to pioneering, culminate in a wagon train as their final delivery stage.

## Description

Traditional clinical trials are uncomplicated and deliberately uncomplicated. In order to better understand the nature of complex diseases like cancer, each trial addresses a single scientific question that only scratches the surface. Responding to a solitary inquiry is a child step in the higher perspective of understanding and relieving disease. In point of fact, some steps are backwards because they take up resources that would be better used if they were distributed more wisely. When we had a limited number of therapies to investigate for a disease that was thought to be homogeneous, simple, one-question trials were satisfactory or at least tolerable. The issue is that there are numerous types of cancer. It's possible that our earlier taxonomy by organ of origin contributed as much to progress as it hindered it. Compared to, say, breast cancer, a lung cancer is more similar to other lung cancers. However, understanding lung cancer is dependent on its diversity. Additionally, modelling across organ sites is essential to its treatment. The growing number of small molecules with anti-cancer properties comes along with a deeper comprehension of cancer's drivers and backseat drivers. There are practically infinite therapies that can be created by combining these molecules far more than there are patients to treat. In clinical trials, researchers can only address a small portion of them. False neutrals therapies that have not been evaluated in clinical trials and may never be outweigh both false negatives and false positives. Traditionally, resources have been allocated to ensuring that a small number of treatments do not result in false positives or false negatives. We sort the dirt in our small claim like a blind gold miner, but the real treasures are in nearby mountain ranges [1].

Guardians from the past avoid the novel and the unknown in favour of what they know. Tradition is a stumbling block to progress. RCTs' contributions to medical advancements demonstrate their value. But there aren't enough of them. The RCT needs to reach new heights. Additionally, as the Brave New World progresses, we need to think about a variety of approaches to clinical trials. It is ironic that while we use the same clinical trial strategy to evaluate a variety of experimental therapies with the potential to transform lives, we do not experiment with the clinical trial's design. Hypothesis testing, as well as controlling the type I error rate and statistical power, are at the centre of traditional clinical trial design. A typical clinical trial would involve comparing an experimental arm to a control arm. With 90% power and a 5% two-sided type I error rate, they might want to be able to detect a 25% reduction in risk if the primary endpoint is time to a particular kind of negative event. Assume the middle chance to occasion in the control arm is supposed to be 3 years, accumulation rate is 4 patients each month, and least resulting follow-up is 3 years then they would work out that around 650 patients would be required [2,3].

The outcomes of such a trial would be reported 16 years from now, when the verdict might not matter. There would be no such trial. Instead, they would act as though they expected a 65 percent reduction with sufficient power from a moderate sample size. It's a prank. The punch line is that both common conditions like hyperlipidaemia and rare diseases like high-risk relapsed tumour use the same method for hypothesis testing. It may work for the former, but it does not work for the latter without the aforementioned pretences. The problem is that the latter is a look at how cancer research will develop in the future. Even for diseases that were prevalent when they were categorized according to organ of origin, the capacity to conduct definitive clinical trials that address the questions that biologists are asking is decreasing. Prevalence of the disease must be explicitly taken into consideration in future cancer trials and others. Additionally, they must take into account the rapid development of alternative therapies and advancements in biology. As a result, trials will be shorter, more focused, and smaller. The objective of the new paradigm for clinical trials ought to be to provide effective treatment to patients who currently have or are likely to have the specific disease in question. As I will explain, randomization will continue to play a role, albeit one that is more refined. However, hypothesis testing will primarily serve ancillary purposes. In the Brave New World, trial designs will be drastically different. The future of drug development and regulation is unknown, but significant shifts are inevitable. In the following sections, I will talk about some trial designs and strategies that are being looked into to deal with a growing number of patient subpopulations that are always getting smaller. The future may be foreshadowed by some of these designs. Some go completely against the norm when it comes to designing clinical trials. However, they lack enough differentiation. In the sense that they take a standard approach to hypothesis testing, all of the designs I'm considering are rooted in the past [4,5].

## Conclusion

This article discusses two designs that are currently being investigated: basket trials and platform trials. Both are making an effort to combine clinical practice and clinical research. However, neither is the final solution, and there most likely is not one. We need to learn how to combine information from randomized trials, preclinical studies, and patient databases, as well as biological knowledge. As clinical trials become smaller than they are now by orders of magnitude, such synthesis will be necessary. It is impossible to

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conduct large clinical trials in diseases with a narrow scope. Additionally, the definitions of all cancers are becoming more and narrower. In the Brave New World, no one understands the regulatory model. Additionally, no one is aware of the corresponding pharmaceutical company business model. The only thing that is certain is that neither will be the same as it is now. Additionally, clinical trials will have a unique statistical design. Error probabilities of type I and type II will no longer exist and will be replaced by a specific goal of providing patients with the disease with effective therapy. It will become even more difficult to tell clinical practice from clinical trials in the future.

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