



PERSPECTIVE



## Brief Note on Medical Research Phases

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### Introduction

Medical research, also known as biomedical research or experimental medicine, encompasses a wide range of research, ranging from “Basic research,” also known as bench science or bench research, entails fundamental scientific principles that may apply to a variety of fields. a preclinical understanding, to clinical research, which involves studies on people who could be clinical trial subjects. Here is an example of basic research, also known as pure research or fundamental research, which aims to improve scientific theories in order to better understand and predict natural or other set of conditions.

Clinical research is a branch of healthcare science that assesses the safety and the safety and efficacy of human-use medications, devices, diagnostic products, and treatment methods of treatment. These can be used for disease prevention, treatment, diagnosis, or symptom relief. Clinical research is not the same as clinical practice. Established treatments are used in clinical practice, whereas evidence is gathered in clinical research to establish a treatment. The Clinical trials are clinical research experiments or observations. Such prospective biomedical or behavioral research studies on human participants are designed to answer specific questions about biomedical or behavioral interventions, such as new treatments (such as novel vaccines, drugs, dietary choices, dietary supplements, and medical devices) and known interventions that merit further investigation and comparison. This spectrum includes applied research, also known as translational research, which is done to advance medical knowledge.

In the pharmaceutical industry’s drug development pipelines, both clinical and preclinical research phases exist, with the clinical phase denoted by the term clinical trial. However, only a portion of clinical or preclinical research is focused on a specific pharmaceutical goal. Pharmaceutical research is only a small part of medical research due to the need for fundamental and mechanism-based understanding, diagnostics, medical devices, and non-pharmaceutical methods of treatment.

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### Basic medical research

Cellular and molecular biology, medical genetics, immunology, neuroscience, and psychology are some examples of basic medical research. Researchers, primarily at universities or government-funded research institutes, seek to gain a better understanding of the cellular, molecular, and physiological mechanisms underlying human health and set of situations. Here is Molecular biology is a branch of biology that studies the molecular basis of biological activity within and between cells, which contains molecular synthesis, modification, mechanisms, and interactions.

The study of the chemical and physical structure of biological macromolecules is known as molecular biology. Neuroscience is the basic science central nervous system. It is a multidisciplinary science that integrates physiology, anatomy, molecular biology, developmental biology, cytology, computer science, and mathematical modeling to better understand the fundamental and emergent properties of neurons, glia, and neural circuits.

### Pre-clinical research

Pre-clinical research entails the investigation of mechanisms that may lead to human clinical trials. Typically, no ethical approval is required, the work is overseen by scientists rather than physicians, and it is carried out in a university or company rather than a hospital. A physician, also known as a medical practitioner, a medical doctor, or simply a doctor, is a health professional who practices medicine, which is concerned with promoting, maintaining, or restoring health by studying, diagnosing, prognosis, and treating disease, injury, and other physical and mental impairments. Physicians can specialize their practice by focusing on specific disease categories, patient types, and treatment methods or they can practice general medicine, which involves providing ongoing and comprehensive medical care to individuals, families, and communities.

### Clinical research

Humans are used as experimental subjects in clinical research. It is typically supervised by physicians and carried

out by nurses in a medical setting such as a hospital or research clinic, and it is subject to ethical approval. And the clinical research is a branch of healthcare science that assesses the safety and efficacy of medications, devices, diagnostic products, and treatment regimens intended for human use. These can be used for disease prevention, treatment, diagnosis, or symptom relief. Clinical research is not the same as clinical practice. Established treatments are used in clinical practice, whereas evidence is gathered in clinical research to establish a treatment.

Human subject research is a systematic, scientific inves-

tigation that involves human beings as research subjects, also known as test subjects, and can be interventional or causal inference. Human subject research can be medical or non-medical in nature.

The majority of research in the field is conducted by biomedical scientists, but other types of biologists make significant contributions. Medical research on humans must strictly adhere to the medical ethics enshrined in the Helsinki Declaration and the hospital review board where the research is implemented. Research ethics are expected in all cases.