

## PRECISION MEDICINE: AN EMERGING APPROACH FOR PATIENT CARE

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The philosophy behind contemporary healthcare is that one size fits all. Unfortunately, the outcomes of a standardized treatment regimen are not always uniform. That's where the concept of precision medicine comes in. According to the Precision Medicine Initiative, precision medicine is "an emerging approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person." This approach allow doctors and researchers to predict more accurately which treatment and prevention strategies for a particular disease will work in which groups of people and is in contrast to a one-size-fits-all approach, in which disease treatment and prevention strategies are developed for the average person, with less consideration for the differences between individuals. Although the term "precision medicine" is relatively new, the concept has been a part of healthcare for many years. For example, a person who needs a blood transfusion is not given blood from a randomly selected donor; instead, the donor's blood type is matched to the recipient to reduce the risk of complications. The adoption of precision medicine will grow because its benefits to healthcare providers and patients are numerous. The highlighting ones are to shift the emphasis in medicine from reaction to prevention, predict susceptibility to disease, improve disease detection, preempt disease progression, customize disease-prevention strategies, prescribe more effective drugs, avoid prescribing drugs with predictable side effects and so on. The goal of precision medicine is to target the right treatments to the right patients at the right time. The short-term goals involve expanding precision medicine in the area of cancer research. Researchers at the National Cancer Institute (NCI) hope to use an increased knowledge of the genetics and biology of cancer to find new, more effective treatments for various forms of this disease. The long-term goals of the Precision Medicine Initiative focus on bringing precision medicine to all areas of health and healthcare on a large scale. Insufficient technologies, limited knowledge, and gaps in research are major obstacles to adding precision medicine to routine clinical care. Advances in precision medicine have already led to powerful new discoveries and FDA-approved treatments that are tailored to specific characteristics of individuals. Patients with a variety of cancers routinely undergo molecular testing as part of patient care, enabling physicians to select treatments that improve chances of survival and reduce exposure to adverse effects. Precision medicine will timely enable clinicians to integrate healthcare data with targeted assays and tests to identify and assess disease biomarkers and risks, determine actionable genetic variants in patients, obtain the entire picture of the metabolome, and map metabolites to disease pathways. Implementof precision medicine as a holistic approach, requires integration of genetic, genomic, clinical, environmental and life-style data using mechanistic models that are complex, and must be built from the ground up. The scientific approach would be to perform analysis of individual genomes giving rise to a new form of preventive and personalised medicine in healthcare. Availability of gene-based designer drugs, precise targeting of molecular fingerprints for disease, appropriate drug therapy, predicting individual susceptibility to disease, diagnosis, and treatment of illness are all a few of the many transformations expected in the decade to come.

**Keywords:** Precision Medicine, emerging approach, patient care

**Date received:** 22.04.2023

**Date of acceptance:** 05.05.2023

DOI: <https://doi.org/10.3329/bjm.v34i20.66150>

**Citation:** Hossain MA. Precision Medicine: An emerging approach for patient care. *Bangladesh J Medicine* 2023; Vol. 34, No. 2(1) Supplementation: 201.