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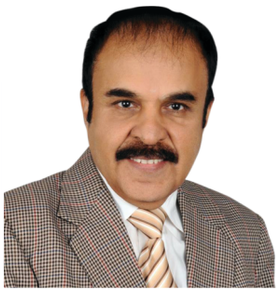
Editor's Desk



Dr. A. Muruganathan
Chief Editor

What is Precision Medicine?

A medicine that uses information about a person's genes or proteins to prevent, diagnose, or treat disease.

Precision medicine is "an emerging approach for disease treatment and prevention that considers individual variability in genes, environment, and lifestyle for each person." Lifestyle includes the behavioral factors that can influence health and disease. These include diet, exercise, mental health, smoking status, and social support. This approach will allow doctors and researchers to predict more accurately which treatment and prevention strategies for a particular disease will work in which groups of people. It 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. The concept of Precision medicine 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

Precision medicine uses techniques such as molecular diagnostics (which includes genetic testing), molecular imaging, next-generation sequencing, and molecular dynamics to diagnose disease and tailor treatments to the individual.

Precision medicine methods identify phenotypes of patients with less-common responses to treatment or unique healthcare needs. AI leverages sophisticated computation and inference to generate insights, enables the system to reason and learn, and empowers clinician decision-making through augmented intelligence.

What are the advantages of precision medicine?

Wider ability of doctors to use patients' genetic and other molecular information as part of routine medical care. Improved ability to predict which treatments will work best for specific patients. Better understanding of the underlying mechanisms by which various diseases occur.

Precision medicine is at the heart of immunotherapy, currently one of the hottest areas of cancer research. Immunotherapy is a new approach that harnesses the power of our immune systems to identify and control diseases such as cancer. Immunotherapy is being studied in just about every type of cancer.

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Cancer risk and prevention

Sometimes precision medicine is used for people who are at higher risk for developing certain cancers. For example, a person might realize cancer runs in their family, or their family doctor might notice a pattern of cancer in their family

How is precision medicine done?

In cancer, precision medicine involves testing DNA from patients' tumors to identify the mutations or other genetic changes that drive their cancer. Physicians then may be able to select a treatment for a particular patient's cancer that best matches, or targets, the culprit mutations in the tumor DNA.

Precision oncology has had some major successes. Imatinib has a 95% response rate in patients with chronic myeloid leukemia and extends quality-adjusted life by about 9 years; venetoclax has an 80% response rate in patients with chronic lymphocytic leukemia who have a 17p deletion

Genomics of hypertension: the road to precision medicine

The known genetic architecture of blood pressure now comprises >30 genes, with rare variants resulting in monogenic forms of hypertension or hypotension and >1,477 common single-nucleotide polymorphisms (SNPs) being associated with the blood pressure phenotype. Monogenic blood pressure syndromes predominantly involve the renin–angiotensin–aldosterone system and the adrenal glucocorticoid pathway, with a smaller fraction caused by neuroendocrine tumours of the sympathetic and parasympathetic nervous systems.

Perspectives on current thinking that the more complex "triad" of the genome, epigenome, and the microbiome operating to influence the inheritance of hypertension, is documented

A mind shift is required in order to fully exploit the potential of precision medicine to tackle the global burden of cardiovascular diseases.

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