

## Exploring the Role of Health-care Professionals and Impact of Precision Medicine on Health Outcomes and Efficiency

### Abstract

The inclusion of precision medicine in medical education represents a paradigm shift, as it is expected to transform the way in which health care will be delivered to patients in future. This shift is predominantly reported as precision medicine strongly advocates for the delivery of personalized care to patients after giving due consideration to the genetic makeup, biomarker level, etc., of the individual patient. Medical professionals are expected to discharge a wide range of roles since the introduction of precision medicine in the health-care industry. Training of medical students and health professionals in the domain of precision medicine is expected to significantly influence patient outcomes and enhance the efficiency of the health-care sector. In conclusion, precision medicine is expected to have a huge impact on medical professionals and the health sector, it is the need of the hour to strengthen its implementation process across medical colleges and health-care facilities.

**Keywords:** Health care, medical education, precision medicine

### Introduction

The inclusion of precision medicine in medical education represents a paradigm shift, as it is expected to transform the way in which health care will be delivered to patients in future.<sup>[1]</sup> This shift is predominantly reported as precision medicine strongly advocates for the delivery of personalized care to patients after giving due consideration to the genetic makeup, biomarker level, etc., of the individual patient.<sup>[1,2]</sup> In other words, precision medicine envisages the delivery of customized interventions to patients based on their specific genetic and environmental attributes.<sup>[2,3]</sup> In addition, significant impetus has also been given to understanding the ethical implications, data interpretation, and interdisciplinary collaboration to streamline the process of diagnosis and treatment of patients.<sup>[3,4]</sup> Training of medical students in different aspects of precision medicine is expected to prepare them to effectively respond to future healthcare-related needs, which is not possible with traditional medical education.<sup>[1,5]</sup>

### Role of Medical Professionals in Precision Medicine

Medical professionals are expected to

discharge a wide range of roles since the introduction of precision medicine in the health-care industry.<sup>[1,2]</sup> As orientation to genetics and genomics is an integral aspect of practicing precision medicine, medical professionals play a defining role in carrying out genetic counseling and thereby helping patients understand the need and implications of genetic testing in multiple decisions related to health care.<sup>[6]</sup> As professionals are also exposed to genomic and biomarker-related data, they can interpret and make clinical decisions based on the available findings.<sup>[7]</sup> In continuation, these decisions pertaining to treatment are specific to the individual, as they are taken after considering the genetic and molecular attributes of an individual patient.<sup>[8]</sup> While doing so, not only doctors are succeeding in integrating technology with medicine but also become self-directed learners (as they realize the importance of staying abreast with recent developments) and apply the evolving knowledge to patient care.<sup>[9]</sup>

Once medical doctors explain the line of management to patients that is derived based on the specific characteristics of the patient, not only does it augment the understanding level of patients about their illnesses but also even actively engages them in health-care decisions and promotes

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better adherence to treatment plans.<sup>[10,11]</sup> In continuation, as a doctor accommodates the preferences and values of patients in clinical decision-making, they actually succeed in the delivery of patient-centered care.<sup>[11]</sup> Health-care professionals also get a platform to collaborate with other disciplines and thereby implement a holistic approach to patient care.<sup>[12]</sup> In addition, medical doctors must advocate for the responsible use of genetic information, maintain data privacy and also conduct genetic testing provided the need is there.<sup>[1,2,13]</sup> Further, depending on the genetic picture, the doctors must conduct risk assessments and accordingly implement appropriate preventive measures depending on the potential risk for certain diseases.<sup>[14]</sup> Finally, medical professionals have to work on their communication skills, as they are expected to convey complex information to the patients in a clear manner and accordingly obtain their opinion or concurrence for the proposed line of treatment.<sup>[15]</sup>

### Impact of Teaching Precision Medicine

Training of medical students and health-care professionals in the domain of precision medicine is expected to significantly influence patient outcomes and enhance the efficiency of the health-care sector.<sup>[1]</sup> This can be accomplished in multiple ways, starting with, students who are trained in this novel approach to medicine and are skilled enough to prepare customized treatment plans for specific patients based on their unique genetic and molecular profiles.<sup>[6,16]</sup> As health-care professionals take into account the genetic and biomarker attributes of a patient, there is a significant improvement in diagnostic accuracy and a massive reduction in the probability of making a wrong diagnosis.<sup>[1,8]</sup> Once we are aware of the genomic profile of a patient, we can smartly select appropriate medications for a specific patient and not waste time and resources in trial and error. In continuation, as we prescribe treatment to a patient based on their genetic profile, there is a significant reduction in the incidence of adverse effects following treatment.<sup>[17]</sup> Once medical students and health-care professionals are aware of the basics of precision medicine, they are well informed and empowered to actively engage patients in discussions pertaining to their genetic profile, diagnosis, and treatment options.<sup>[10]</sup>

The application of precision medicine enables the categorization of patients depending on their genetic and molecular attributes, and accordingly, we can implement targeted preventive measures.<sup>[17]</sup> This can further aid in facilitating the process of early detection of diseases, which in turn accounts for improvement in patient prognosis.<sup>[18]</sup> As patients receive personalized and precise care, they tend to experience improved treatment outcomes, which in turn accounts for improved trust and increased satisfaction among patients.<sup>[19]</sup> Precision medicine has also been linked with reducing disparities in health care

regardless of sociodemographic attributes of the general population and augmentation of research activities, which in turn can improve patient care and treatment outcomes.<sup>[1,3]</sup> As health-care professionals start making data-driven decisions, it results in establishing a culture of evidence-based practice, which is the need of the hour.<sup>[4,20]</sup> Finally, the adoption of precision medicine also accounts for the efficient utilization of resources, which can be attributed to a reduction in unnecessary tests, treatments, and hospitalizations, and thereby a decrease in direct and indirect health-related expenditures.<sup>[1-3]</sup>

### Conclusion

Precision medicine is expected to have a huge impact on medical professionals and the health-care domain. Acknowledging the fact that precision medicine can significantly impact the patient-related outcomes and efficiency of the health sector, it is the need of the hour to strengthen its implementation process across medical colleges and health-care facilities.

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### Conflicts of interest

There are no conflicts of interest.

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