# Precision Medicine

## Question

How is precision medicine used, and does it present liability concerns or other challenges for healthcare providers?

## Answer

Designing treatment plans based on a person's genetic makeup is transforming healthcare. Precision medicine, which brings a unique approach to healthcare, involves matching medical treatment with an individual's DNA, environment, and lifestyle.[1] Doctors and researchers can predict more accurately which treatment and prevention strategies for a particular disease will work in which groups of people, thus improving quality and outcomes.

Genetics and genomics are two components of precision medicine. Benefits of advances in these sciences include:

- The ability to prevent adverse outcomes, such as drug reactions or toxicities
- The development of life-changing molecular treatments for patients who have rare diseases
- The development of new medications for various conditions[2]

Beyond genetics and genomics, advances also have occurred in molecular diagnostics and data science.[3] Those advances incorporate artificial intelligence (AI), digital health tools, and big data integration into precision medicine.[4] According to the American Medical Association (AMA), AI is necessary in precision medicine to assemble, review, and analyze data to help healthcare providers diagnose and treat their patients.[5]

AMA suggests several strategies are necessary to support the success of precision medicine, including gathering large longitudinal cohorts, focusing on increasing diversity, using routine genomic

analysis, obtaining more phenomics and environmental data, ensuring data privacy, and fostering collaboration among stakeholders.[6]

Although precision medicine offers vast benefits, it is not without concerns. For example, some risks and liability exposures have been identified with genetic testing — the diagnostic approach that identifies mutations in chromosomes, genes, or proteins that may cause illness or disease. Areas of practice in which these have occurred include obstetrics, oncology, and cardiology.

A limited amount of MedPro claims data indicates that allegations against healthcare providers resulted from:

- Failure to recommend, failure to order, or delays in ordering genetic testing
- Failure to refer a patient to a specialist for genetic counseling
- Failure to follow up on a patient's genetic testing results
- Failure to follow the genetic specialist's recommendations
- Misinterpretation of diagnostic studies
- Failure to understand risks like a medical geneticist would

Further, although genetic testing provides valuable information for diagnosing, treating, and preventing illness and disease, it has limitations. For example, a positive result from genetic testing for a healthy person doesn't always indicate disease development. Similarly, a negative result doesn't always guarantee that a certain disorder won't develop.[7]

Explaining these limitations to patients/families and setting clear expectations for genetic testing can help support informed decision-making and avoid misperceptions. Providers should ensure that information about genetic testing is presented to patients/families in ways that they can understand. Using a technique such as teach-back can help providers gauge patient comprehension and address inaccuracies or confusion.

Beyond liability concerns, precision medicine also presents ongoing ethical issues. The *AMA Journal of Ethics* identifies these potential ethical dilemmas as privacy, informed consent, shared decision-making, disclosure, social justice, valuation practices, regulation of human subjects research, etc.[8]

As efforts to expand precision medicine continue, other legal and ethical considerations may come to light as well as best practices and strategies to address them. Healthcare providers who plan to incorporate aspects of precision medicine into practice should stay abreast of these developments and determine how best to partner with patients to maximize the value of precision care and mitigate potential risks.

## Resources

- AMA Journal of Ethics: Ethics in Precision Medicine
- American Cancer Society: Precision or Personalized Medicine
- American Medical Association: Education & Resources in Genetics & Personalized Medicine
- Brookings: Advancing Precision Medicine Through Agile Governance
- Health eCareers: The Future of Precision Medicine: What Every Physician Should Know
- JAMA Insights: Genomics and Precision Health
- National Institutes of Health: National Human Genome Research Institute (NHGRI)
- The Journal of Precision Medicine: Integrating Personalized Medicine into Preventive Care through Risk Stratification
- U.S. National Library of Health, National Institutes of Health: Genetics Home Reference

## Endnotes

[1] BIS Research. (2024, March 15). *Beyond one-size-fits-all: The role of precision medicine in modern healthcare.* Retrieved from https://bisresearch.com/insights/the-role-of-precision-medicine-in-modern-healthcare-industry

[2] Phillips, A. (2024, May 28). *The shift toward precision medicine requires claims data insights.* PurpleLab Healthcare Analytics. Retrieved from https://purplelab.com/article-precision-medicine/; Denny, J. C., & Collins, F. S. (2021, March 18). Precision medicine in 2030–seven ways to transform healthcare. *Cell, 184*(6), 1415–1419. doi: https://doi.org/10.1016/j.cell.2021.01.015

[3] Ibid.

[4] Ibid.

[5] Smith, T. M. (2024, October 17). *The future of AI and precision health: What stands in the way.* American Medical Association. Retrieved from www.ama-assn.org/practice-management/digital-health/future-ai-and-precision-health-what-stands-way

[6] Ibid.

[7] Mayo Clinic. (2014, May 14). *Genetic testing*. Retrieved from www.mayoclinic.org/tests-procedures/genetic-testing/about/pac-20384827

[8] Batten, J. N. (2018, September). How stratification unites ethical issues in precision health. *AMA Journal of Ethics, 20*(9), E798-803. doi: 10.1001/amajethics.2018.798.