Precision or Personalized Medicine

What is precision medicine?

Precision medicine is a way health care providers can offer and plan specific care for their patients, based on the particular genes, proteins, and other substances in a person's body. This approach is also sometimes called *personalized medicine* or *personalized care*.

With regard to cancer, precision medicine most often means looking at how changes in certain genes or proteins in a person's cancer cells might affect their care, such as their treatment options. But it can have other uses as well.

In precision medicine, doctors use information from certain lab tests to put together a plan of care that usually includes specific recommendations. In some cases, it can help make a more accurate diagnosis and improve treatment. In other cases, it can help people make decisions about healthy habits, earlier screening tests[1], and other steps they can take that might help lower their risk for a particular cancer.

Your health care providers might not use the exact words "precision medicine" or "personalized medicine." Instead, they might talk to you about genetic, genomic, DNA, or molecular testing. Or they might talk about checking for biomarkers or getting a genetic profile. These are ways doctors and other health care providers might use a precision medicine approach when they are planning your care.

Some of the more common cancers where precision medicine is being used to help with treatment decisions include:

- Colorectal cancer
- Breast cancer
- Lung cancer
- Certain types of leukemia
- Certain types of lymphoma
- Melanoma
- Esophageal cancer
- Stomach cancer
- Ovarian cancer
- Thyroid cancer

If you have a type of cancer for which treatment options might depend on if the cells have certain gene or protein changes, your cancer will likely be tested for them.

You might need to ask your doctor some questions to know if this type of testing was done. (See below.) People with the types of cancer listed above are usually tested for certain gene or protein changes when they are diagnosed, or shortly after. Some cancers might also be tested for changes if they keep growing during treatment, or if they come back.

Limitations to precision medicine in cancer

Access to the latest precision medicine approaches might be limited in some places. A lot still needs to be learned about how precision medicine can be used in cancer care. Researchers are trying to fill those gaps, both in lab studies and in clinical trials[7].

Many clinical trials are done with people who have specific types of cancer. But to be part of a precision medicine clinical trial, a person's cancer cells must have certain gene or protein changes that can be targeted by the medicine that's being tested. And precision medicine clinical trials are often available only at larger cancer centers. This means sometimes the chances for taking part Ts 4T0 0m how p need tr cancer centers. T/F2g ET Bg

might not be well known or evaluated. Or, genetic testing might not have been done, its results might not be adequate, or the results might not be used to make the best decisions about health.

- Regarding **cancer treatment**, even if a person is diagnosed with a type of cancer where tests are available to look for gene or protein changes that might affect treatment options, the cancer might not be tested for these changes.

Hyperlinks

1. www.cancer.org/cancer/screening/american-cancer-society-guidelines-for-the-early-detection-of-cancer.html
2. www.cancer.org/cancer/understanding-cancer/genes-and-cancer.html
3. www.cancer.org/cancer/risk-prevention/genetics/genetic-testing-for-cancer-risk/understanding-genetic-testing-for-cancer.html
4. www.cancer.org/cancer/managing-cancer/treatment-types/targeted-therapy.html
5. www.cancer.org/cancer/managing-cancer/treatment-types/immunotherapy.html
6. www.cancer.org/cancer/diagnosis-staging/tests/biomarker-tests.html
7. www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html
8. www.cancer.org/cancer/risk-prevention/genetics/genetic-testing-for-cancer-risk/understanding-genetic-testing-for-cancer.html
9. www.cancer.org/cancer/managing-cancer/making-treatment-decisions/making-decisions.html

References

Awad K, Dalby M, Cree, IA, Challoner BR, Ghosh S, Thurston DE. The precision

and clinical trials in the community-based oncology practice: Barriers and best practices. *ASCO Educational Book.* 2018;38:188-196.Accessed at https://ascopubs.org/doi/10.1200/EDBK_200633 on March 9, 2020.

Harvard Business School Kraft Precision Medicine Accelerator. *Direct to patient: Where precision medicine starts.* Accessed at https://www.hbs.edu/kraft-accelerator/workstreams/Pages/direct-to-patient.aspx on March 9, 2020.

Iqvia Institute for Human Data Science. *Global oncology trends: 2019.* Accessed at https://www.iqvia.com/-/media/iqvia/pdfs/institute-reports/global-oncology-trends-2019.pdf?_=1583864673144 on March 9, 2020.

Krzyszczyk P, et al. The growing role of precision and personalized medicine for cancer treatment. *Technology.* 2018;6(3-4):79-100.

National Cancer Institute (NCI). *Precision medicine in cancer treatment.* 2017.Accessed at https://www.cancer.gov/about-cancer/treatment/types/precision-medicine on March 9, 2020.

National Comprehensive Cancer Network (NCCN). *Biomarker testing.* Accessed at https://www.nccn.org/patients/resources/life_with_cancer/treatment/biomarker_testing.aspx on March 9, 2020.

National Comprehensive Cancer Network (NCCN). *Personalized medicine: One size doesn't fit all.* Accessed at https://www.nccn.org/patients/resources/life_with_cancer/treatment/personalized_medicine.aspx on March 9, 2020.

Shaban-Nejad A, Michalowski M, Peek N, Brownstein JS, Buckeridge DL. Seven pillars of precision digital health and medicine. *Artificial Intelligence In Medicine*. 2020;103:101793.

Wilson JL, Altman RB. Biomarkers: Delivering on the expectation of molecularly driven, quantitative health. *Exp Biol Med.* 2018;243(3):313-322.

Zou J, Wang E. Cancer biomarker discovery for precision medicine: New progress. *Curr Med Chem.* 2019;26(42):7655-7671.

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