

PERSONALIZED MEDICINE

Personalized medicine refers to medical care that is based on the patient's genes and specific disease. Genes are the information that tells cells in the body how to grow and develop. Many cancers affect or involve specific genes, and personalized cancer medicine comes from the study of human genes and the genes of different cancers. These studies have helped researchers design more effective treatments. In addition, this genetic information has been used to develop tests for cancer and ways to prevent cancer.²²⁵

Before personalized medicine, people with the same cancer received the same treatment. Over time, doctors noticed that treatments worked better for some patients than others. Researchers found genetic differences in people and their cancers, and these differences helped to explain why cancers responded differently to the same treatment.²²⁶

Types of Personalized Medicine include:^{227,228}

- Targeted Therapy, which uses drugs or other substances that block the growth and spread of cancer by interfering with specific molecules that are involved in the growth, progression, and spread of cancer, and
- Pharmacogenomics, which studies how genetic variations influence drug efficacy and toxicity.

RESEARCH AND CLINICAL TRIALS

Cancer research drives progress in the areas of cancer prevention, detection, diagnosis, treatment, and quality of life. Cancer research activities include laboratory research, population or epidemiological research, clinical practice, and clinical research. There is also growing interest in translational research, which “transforms scientific discoveries arising from laboratory, clinical or population studies into clinically relevant applications to improve health by reducing disease incidence, morbidity and mortality.”²²⁹

As a result of research and clinical trials findings, the field of cancer control is continually evolving. As emerging technologies and knowledge related to cancer early detection and treatment change, the Cancer Plan will be reviewed and updated.

Current Research Facilities in Maryland

Across the state of Maryland, cancer research is conducted at various universities, research institutions, and medical facilities, with the support of federal, state, and private funding. Maryland is also home to two nationally recognized cancer research institutions. The NCI has awarded the NCI-Designated Comprehensive Cancer Center honor to the Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins University, Baltimore and to the University of Maryland Marlene and Stewart Greenebaum Comprehensive Cancer Center in Baltimore.²³⁰ This designation is reserved for institutions that are recognized by the NCI for the depth and breadth of their research in each of three major areas (i.e., laboratory, clinical, and population-based research), as well as substantial transdisciplinary research that bridges these scientific areas.²³¹ The NCI cancer research facility is also located in Maryland.

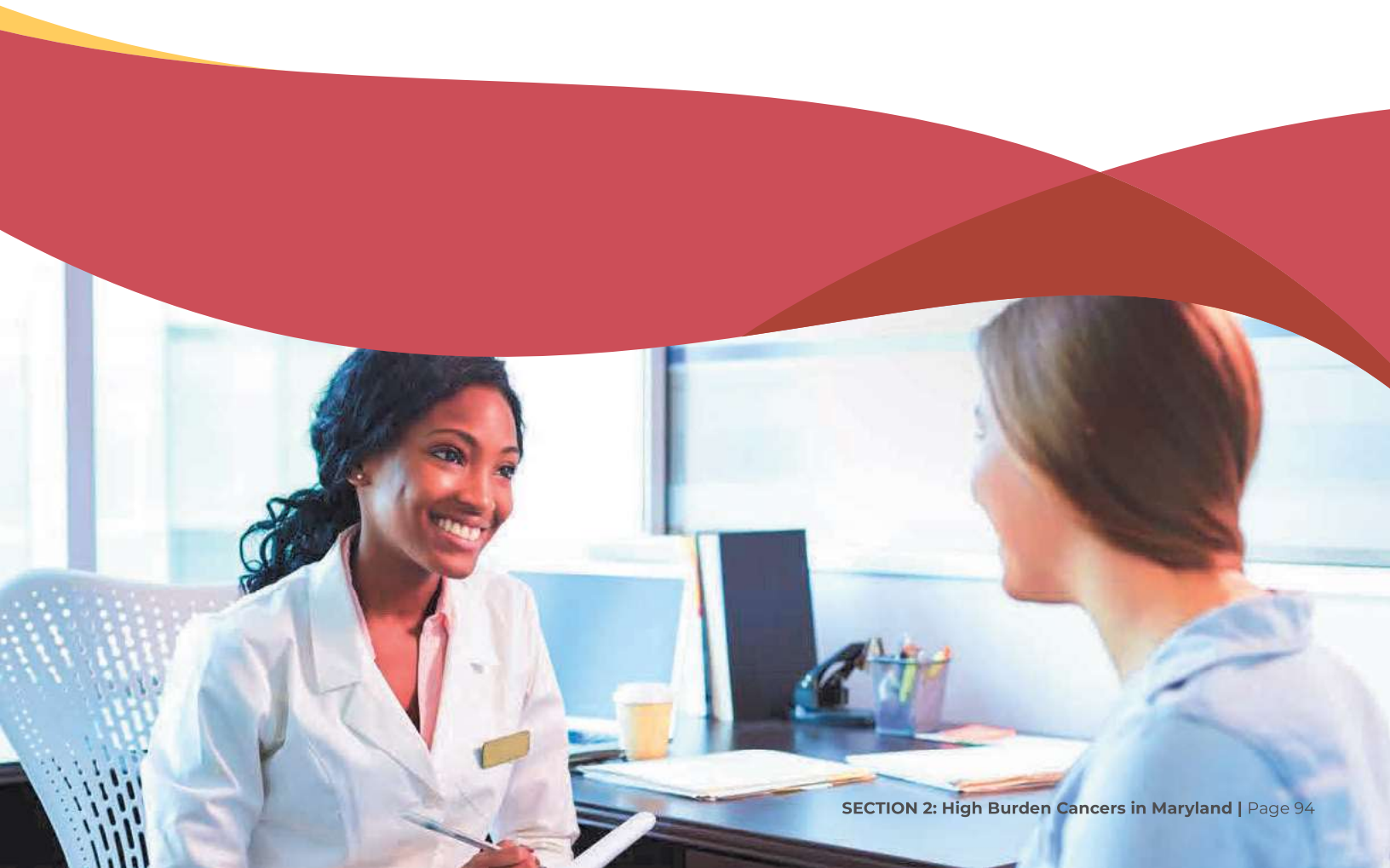
Clinical Trials

Clinical trials are research studies in which human volunteers help researchers test the safety and effectiveness of new medical interventions. Cancer clinical trials are used to explore new ways to prevent, detect, diagnose, or treat cancers. Participants of clinical trials have the opportunity to access new treatments that are not available to the public, receive expert medical care, and contribute to the advancement of medical research.

Types of Clinical Trials

There are several types of cancer clinical trials:²³²

- **Treatment trials** are used to test the effectiveness of new treatments or new ways of using current treatments.
- **Prevention trials** are used to test new interventions that may lower the risk of developing certain types of cancer.
- **Screening trials** are used to test new ways of finding cancer in its early stages.
- **Quality of life/supportive care/palliative care trials** are used to study new ways of improving the comfort and quality of life of cancer patients and cancer survivors, especially those who have side effects from cancer or its treatment.



Clinical Trial Participation Rates and Disparities

Despite the benefits of clinical trials, the number of adult cancer patients in clinical trials is extremely low, at approximately 3% of adult cancer patients.²³³ In comparison, more than 60% of children with cancer participate in clinical trials.²³⁴ In Maryland, only 5% of adult cancer patients reported participation in a clinical trial as part of their cancer treatment.²³⁵

Populations that remain underrepresented in clinical trials include minorities, older adults, and people living in rural areas.^{236,237,238,239,240} Although African Americans have the highest overall cancer mortality rate and highest incidence rates for some specific cancer sites, from 2017 to 2019 less than 5% of participants enrolled in FDA cancer clinical trials that led to approval of a new drug were African Americans.^{241,242,243,244} Populations that are accrued onto clinical trials at a higher rate in Maryland include pediatric and adolescent age groups, White patients, females (for sex-specific tumors), and patients with private health insurance.²⁴⁵ Adequate representation from all affected populations is needed to enable researchers to learn about potential differences among population groups and to ensure generalizability of the trial results.

There are many reasons for low cancer clinical trial participation rates. Health care provider lack of awareness, referral, or encouragement have been cited as reasons for low patient participation rates.^{246,247} Lack of patient awareness is also a key problem.^{248,249} In an online survey conducted in 2018 on behalf of the ASCO, 63% of cancer patients reported that they were not sure if they were eligible for any clinical trials, and more than half of these non-participants would have been interested if they had known they were eligible.²⁵⁰ Other reasons shared include patients' fear or mistrust, cost barriers, practical issues (transportation, time off from work), cultural differences, and language or literacy barriers.^{251,252} Maryland law requires health insurers, nonprofit health service plans, and health maintenance organizations to cover specified patient costs that are incurred as a result of prevention, early detection, and treatment studies on cancer.^{253,254} More information on the availability of clinical trials can be found on the NCI Clinical Trials website, located at www.cancer.gov/clinicaltrials/search.

