

CANCER ADVANCES IN FOCUS

Cancer

Yesterday

- During the period 1974-1976, the 5-year survival rate among adults for all cancers combined was 50%; among whites, it was 51%; among blacks, it was approximately 39%.
- During the same period, the 5-year survival rate for all childhood cancers combined was less than 50%.
- For the five most common cancers, the 5-year survival rates were: Breast, 75%; colon, 50%; lung, 13%; prostate, 68%; and rectum, 49%.
- Clinical investigation of combination chemotherapy, using multiple drugs with different mechanisms of action, in the treatment of cancer was just beginning.
- Clinical studies of anticancer vaccines (treatment or prevention) and of drugs to prevent cancer had not yet begun.

Today

- Among adults, the 5-year survival rate for all cancers combined is now approximately 65%; among whites, it is about 66%; among blacks, it is about 56%.
- The 5-year survival rate for all childhood cancers combined is now nearly 80%.
- As of 2001, the latest year for which we have updated statistics, the 5-year survival rates for the five most common cancers were: Breast, 90%; colon, 65%; lung, 16%; prostate, 100%; and rectum, 65%.
- Combination chemotherapy is now standard in the treatment of many cancers and has contributed to increasing survival and cure rates. For example, the introduction of combination chemotherapy, including the drug cisplatin, has led to cure rates for testicular cancer of approximately 95%. Treatment for this disease has become so effective that 80% of patients with metastatic testicular cancer can now be cured. Thirty-five years ago, 95% of these patients died, usually within 1 year of diagnosis.
- Two vaccines have been approved by the U.S. Food and Drug Administration (FDA) that have the potential to prevent some forms of liver cancer (hepatitis B virus vaccine) and



approximately 70% of cervical cancers (vaccine against human papillomavirus strains 16 and 18). In addition, several cancer treatment vaccines are currently being evaluated in large-scale clinical trials, including vaccines for the treatment of non-Hodgkin lymphoma, melanoma, kidney cancer, multiple myeloma, and prostate cancer.

- Therapies that target the specific molecular changes that cause cells to become cancerous or processes that are required for continuous cancer cell growth and metastasis are now part of our therapeutic arsenal. To date, the FDA has approved more than a dozen molecularly targeted agents for cancer-related indications, including trastuzumab and three different aromatase inhibitors for breast cancer; imatinib mesylate for chronic myelogenous leukemia and gastrointestinal stromal cell tumors (GIST); sunitinib for advanced kidney cancer and imatinib-resistant GIST; bevacizumab for advanced colorectal cancer and advanced lung cancer; and bortezomib for multiple myeloma.
- Refined radiation therapy techniques, such as 3-dimensional conformal radiation therapy, stereotactic radiosurgery, and brachytherapy (radioactive seeds), which are designed to deliver high doses of radiation to tumors while minimizing the doses delivered to nearby healthy tissue, are now widely used. These advances are allowing greater tissue, organ, and limb preservation.
- Effective therapies to control the side effects of cancer and its treatment, including pain, nausea, vomiting, and mouth sores, are now available.

Tomorrow

- We will exploit our rapidly increasing knowledge of genetics, molecular biology, and immunology to develop even more effective and less toxic treatments for cancer. This knowledge will also allow us to detect cancer earlier, when it is most treatable, and to individualize patient care.
- We will continue our efforts to expand knowledge of and access to palliative care, to eliminate cancer-related health disparities, and to ensure the best possible outcomes for all cancer patients.

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