

The Future of Cancer Care: From “Sledgehammer” to Precision Cellular Therapy

New immunotherapies improve outcomes, but access to care and clinical trials for many still lags, notes an AACR cancer report. [VIDEO]

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As always with cancer, the news is mixed.

The good news? Science has made great progress with immunotherapies for skin cancers like melanoma, as well as solid tumors like lung cancer which remains the deadliest cancer in the country.

Fred Hutchinson Cancer Center’s [Phil Greenberg, MD](#), president of the American Association for Cancer Research delivered additional good news: research has added years to patients’ lives.

“Progress in cancer research—particularly in the last two decades—has literally been breathtaking,” he said in an AACR video presented at a press briefing in September. “When I started, we treated cancers with what people might call a sledgehammer approach. We’re in an era now where we have drugs that precisely target abnormalities present in a patient’s tumor cell. We’ve introduced an era of precision oncology.”

What does that mean for today’s cancer patients? [Read the full 2023 AACR Progress Report here.](#)

“In the last 40 years, U.S. patients with cancer have collectively gained nearly 14 million years of life because of NCI-funded cancer research,” he said, referring to the [National Cancer Institute](#), just one of the 27 institutes and centers within the National Institutes of Health, or [NIH](#), that oversee publicly funded research.

But there’s also bad news: We still don’t have cures for most cancers and our country’s population is steadily aging. By year 2034, the [U.S. census estimates](#) the country will have more older adults than children. Many of these older adults will face a cancer diagnosis.

New therapies—particularly ones that don’t cause long-term side effects—are desperately needed, as is legislative support for continued research funding to keep the momentum going.

“It’s critical that we continue to receive NIH funding,” said Greenberg, who holds the Rona Jaffe Foundation Endowed Chair at Fred Hutch. “In the last decade, 354 out of 356 drugs approved for use in patients in U.S. were a consequence of investment in research by the National Institutes of Health. It’s the engine that’s driving innovation.”

New initiatives are also needed to make sure all patients—rural, Indigenous, Black, LGBTQ+ and others who often fall through the cracks—have access to the most up-to-date cancer therapies and clinical trials, said AACR’s experts.

How far have we come in kicking cancer to the curb this past year? Read on for more details.

Promising Advances and Trends

According to the report, cancer deaths in the U.S. fell 33% between 1991 and 2020, resulting in an estimated 3.8 million deaths by cancer thwarted. Part of this improvement in outcomes is due to a steep reduction in smoking rates (lung cancer deaths have been decreasing by about 5% a year).

Another part is the result of highly effective new molecular treatments and immunotherapies for a variety of cancers. Last year, specifically, the U.S. Food and Drug Administration (FDA) approved:

- 14 new anticancer drugs including a new immunotherapy for patients with a certain type of bladder cancer; a new type of antibody drug conjugate for ovarian cancer patients and four new T-cell antibodies for patients with blood cancers.
- 2 new types of imaging agents to help visualize cancer cells during surgery. One is the first and only targeted molecular imaging agent that illuminates lung cancers and enhances surgeons’ ability to see cancer in real time. The other is an agent that binds to PSMA (a protein found in most prostate cancers) and enables PET imaging of the prostate and other areas of the body where prostate cancer may have spread.
- Expanded usage for 12 previously approved drugs to treat additional cancer types, including the first approval of an immune checkpoint inhibitor for a rare form of sarcoma in pediatric and adult patients.

Immunotherapies have grown considerably in the last decade. Since 2011, the FDA has approved

11 new immune checkpoint inhibitors, all of which help the immune system go after cancer cells more effectively.

Even better, many of the drugs can be used in more than one type of cancer.

“We can use the immune system in drugs to specifically target cancer,” Greenberg said. “That’s what precision oncology is — creating drugs and using them to selectively target the disease and not injure the person, so we have increased efficacy and reduced toxicity.”

Some of these drugs are even hitting targets once thought impossible.

“Among the new drugs is one that’s targeting a gene called KRAS, one of the most cancer- causing genes in people,” he said. “Mutations to KRAS are linked to a third of all human cancers and it was considered undruggable. The achievement of being able to target just the cells with the mutation is an incredible legacy of science’s advances.”

Familiar Challenges Persist

But are these advances getting out to all cancer patients?

The AACR report also reflected slow progress in eliminating the barriers that prevent many from accessing cancer care and/or cancer clinical trials, particularly Black, Indigenous, rural, LGBTQ+ and other underserved populations. Underserved populations, including racial and ethnic minorities, continue to shoulder a disproportionate burden of cancer.

Additionally, they found:

- Pancreatic cancer and glioblastomas (brain tumors) have few treatment options and five-year relative survival rates remain low.
- The incidence of early-onset cancers is rising—in part due to increasing obesity—including colorectal, pancreatic and uterine.

The high cost of cancer care also continues to burden patients. According to the report, U.S. cancer patients paid an estimated \$16.2 billion in out-of-pocket cancer care costs in 2019, losing an additional \$5 billion in “time costs,” i.e., time spent at appointments, infusions, etc.

“Despite our progress, there’s a whole lot of work that needs to be done,” Greenberg said of these challenges. “There are still structural barriers for lots of people. Underserved populations including racial and ethnic minorities and rural populations are still minimally participating in clinical trials. They still have limited access.”

Newly diagnosed older adults in rural areas, for instance, had a 78% higher one-year mortality compared to those in urban areas. And transgender patients had a twofold or higher increased risk of death from non-Hodgkin lymphoma, prostate or bladder cancer compared to cisgender patients.

Additionally, the report found Black women with breast cancer died at nearly 1.5 times the rate, and those with uterine cancer died at twice the rate, than white women. Similarly, Black men with prostate cancer at twice the rate of white men.

Along with improving access to care, cancer centers and public health researchers need to continue to educate and raise awareness regarding the lifestyle and environment exposures that can increase cancer risk, Greenberg said.

Forty percent of all cancers in the U.S. are associated with preventable risk factors, per the AACR.

“We’ve been able to teach people about the dangers of smoking tobacco and there’s been a remarkable decline in lung cancer in the last five decades,” he said. “But there are other risk factors that need to be addressed like obesity and sedentary lifestyles.”

Launching a New Cancer Alliance

Addressing health disparities and increasing awareness of preventable risk factors—not to mention developing new and better cancer therapies—will take collaboration, the experts agreed.

So along with the annual report, they launched a major collaboration involving all of the country’s cancer centers: AACR’s Cancer Centers Alliance. [Read more about the Alliance here.](#)

“We have to speak with a unified voice, not a competitive voice,” said Cheryl Wilman, MD, executive director of the Mayo Clinic’s cancer program and a two-time cancer survivor. “No single institution or organization has the individual power to overcome cancer. It’s all of our battle. We are the nation’s cancer research engine and 75% of funding that comes from NCI flows through our centers to drive the nation’s cancer research mission.”

The new Alliance is open to all cancer centers (both NCI-designated ones like Fred Hutch, and smaller community cancer centers) and will operate in collaboration with [White House Cancer Moonshot project](#), the NCI, patient advocacy groups, the pharmaceutical industry and other cancer care organizations.

Joining forces will “give us the power to move cancer research and discovery of new treatments even faster,” Wilman said.

Just a few of the items on the Alliance’s huge to-do list: create decentralized clinical trials that utilize community-based nurses and home-delivered drugs; provide better tracking of side effects through wearable devices; develop more effective communication about preventable cancer risks; use AI algorithms for early detection of cancer.

“We need to address all of this as a group,” Greenberg said. “And there’s no reason not to be optimistic.”

As always, though, there is concern over the amount of funding the NIH and its programs will receive in the coming legislative sessions.

Toward that end, AACR also urged Congress to provide the \$1.7 billion in funding designated for [Cancer Moonshot initiatives](#); to appropriate at least \$472.5 million for the [Centers for Disease Control and Prevention’s](#) Division of Cancer Prevention to support comprehensive cancer control, central cancer registries, and screening and awareness programs for specific cancers, and to allocate \$50 million in funding for the [Oncology Center of Excellence](#) at the FDA to conduct expedited review of cancer-related medical products.

“Cancer research has transformed the life of patients,” Greenberg said. “It’s taken people who’ve run out of options and provided not just another option, but a cure. That’s exactly what we hope to do with cancer therapies and it’s the kind of investment that’s been fueled by NIH investments.”

From finding new ways to manipulate the immune system to creating new cancer drugs using mRNA to the rapidly expanding field of microbiome research, the science of cancer is expanding in enormous ways, he said.

“It’s unquestionable that we’re in a time of unparalleled opportunity,” he said. “Not increasing the investment in cancer research would have a devastating effect on the field.”

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