

Cancer treatment has come far, fast: Better prevention, early detection, new treatment

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USA TODAY

Cayden Addison was 3 when he was diagnosed with leukemia and doctors began hammering his small body with chemotherapy.

Despite the terrible side effects and a near-death experience, two years of chemo only bought him about nine treatment-free months before his cancer returned in February.

By then, though, doctors had another tool.

Instead of blasting him with powerful chemotherapy, they were able to direct treatment to his immune system, turning its specialized cells into targeted missiles to attack the tumor cells. Other than a few days of nausea, he had almost no symptoms, his mother, Courtney told a Washington, D.C., audience Wednesday, gathered to hear an update on progress against cancer from the American Association for Cancer Research.

A half century of taxpayer-funded research is paying off for families like the Addisons, of Chesapeake, Virginia, the AACR noted in its annual progress report.

Not only can the Addisons hope that this time their cancer nightmare may truly have an end date but the latest round of treatment doesn't seem to have left Cayden, who turns 7 next week, with any additional health problems.

"We should not have to trade off having long-term side effects for the rest of their lives just to save our babies," Addison said. "They deserve better."

Using the immune system to fight cancer

Progress against cancer has been remarkable.

More than 70% of children with cancer now survive long term and among adults, death rates have fallen by one-third since 1991, avoiding an estimated 3.8 million deaths, thanks to prevention, early detection and new treatments.

Progress has picked up momentum in recent years with advances in immunotherapy, basic tumor biology and genetics, said AACR President Dr. Philip Greenberg.

In the last year alone, 14 new cancer drugs have won federal approval and the uses of another 12 have been expanded to new tumor types or cancer stages.

"It's just a time of such enormous opportunity," said Greenberg, who heads the program in immunology at the Fred Hutchinson Cancer Research Center in Seattle.

One of the biggest advances has been in immunother-

apy: turning a person's own immune system against their cancer.

A decade ago there was just one so-called checkpoint inhibitor approved to treat one type of cancer, melanoma. Checkpoint inhibitors essentially remove the brake that cancer put on the immune system, allowing it to fight off tumors. Now there are 11 approved checkpoint inhibitors addressing 20 different tumor types.

A different type of immune therapy called CAR-T, which was first approved in 2017, is now used to treat six different forms of blood cancer and "more are coming," Greenberg said in an interview after the formal briefing. In some cases, CAR-T, which stands for chimeric antigen receptor T-cell, is so good at teaching the immune system to recognize and kill off cancer cells that cancer disappears never to return.

On Thursday, Drs. Carl June, of the University of Pennsylvania, and Michel Sadelain, of Memorial Sloan Kettering Cancer Center, credited with developing CAR-T therapy, was one of three groups awarded a 2024 Breakthrough Prize in life sciences. The prizes, which are billed as the "Oscars of Science," honor "impactful scientific discoveries" and come with \$3 million awards.

Now that CAR-T has proven itself, June said Wednesday, there has been an explosion of interest, with hundreds of companies running more than 1,000 human trials in many tumor types, along with auto-immune conditions, heart disease and even infections.

"It's all pretty gratifying to see that happening," said June, who has not decided how to spend his share of the prize money.

As with other cancer treatments, challenges remain.

With blood cancers there were obvious targets to train the immune system against, but with other tumor types, it's harder to find "dream targets" that are just on the cancer cells and not also on healthy cells, June said. Killing them would cause unacceptable side effects. Scientists are working to find ways to be as specific as possible.

In solid tumors, CAR-T cells seem to get tired out quickly, working for only a short time, instead of the months or years that they work in blood cancers.

The approach also needs to be made cheaper and by a more mechanized process to make treatments more accessible, June said. "They're all solvable. It's a matter of

the timescale," he said. "But (we've had) a lot of progress in the first 10 years of CAR-T cells and we're going to see these things all get solved."

The same mRNA technology used in COVID-19 vaccines is also proving promising in early cancer trials, offering another potential new way to use the immune system against cancer.

Moderna announced Wednesday that it plans to start a late-stage trial in melanoma and a mid-stage trial in lung cancer along with its partner Merck.

Just as COVID-19 vaccines train the immune system to identify a protein on the surface of the infectious virus and destroy it, an mRNA vaccine can identify proteins made by mutated cancer cells, Moderna CEO Stéphane Bancel said in Tuesday interview.

"What we code is those mutations to teach them to your immune system so your immune system can eat them

like Pac-Man," he said.

Persistent challenges

Such scientific advances have dramatically improved outcomes for some cancer types. Breast cancer deaths fell by 43% between 1989 and 2020, saving roughly 460,000 lives. Lung cancer deaths declined just under 1% a year between 1995 and 2005 but fell 5% annually between 2014 and 2020, thanks to a drop in smoking along with the development of new treatments.

But some other cancers, particularly pancreatic cancer and glioblastoma brain tumors, "still have horrible 5-year rates," Greenberg said. "It is changing. It can change, but it won't change unless there's continued support to drive investment in cancer research."

In the U.S., this year, nearly 2 million people will be newly diagnosed with cancer and more than 600,000 are expected to die. Some cancer types are increasing in frequency, including early-onset colon cancer, pancreatic cancer and uterine cancer, in part due to rising rates of obesity, according to AACR.

In 2019, American cancer patients paid more than \$16 billion out of pocket for cancer care and lost an addition-

al \$5 billion in "time costs," AACR reported.

Disparities in care remain an ongoing issue. Greenberg particularly highlighted disparities among people living in rural areas who do not have access to clinical trials. "The rural community has been very ineffectively reached by progress in cancer," he said.

The AACR announced Wednesday that it will form an alliance with the nation's cancer centers to address issues such as disparities in care, clinical and basic scientific research, training and public communication.

"One of the failures of the scientific community has been communicating to all these populations what the opportunities are, what the advantages are and to create trust in the cancer research enterprise," Greenberg said. "What people need to recognize is how incredible the opportunities are."

Cancer Moonshot

President Biden has said he wants to cut cancer deaths in half within 25 years, a project called the White House Cancer Moonshot.

On Wednesday, the president's Cancer Cabinet met to announce new actions federal agencies are taking toward

that goal, along with related commitments from the private sector. The new actions include:

*\$240 million in additional investment this year to accelerate cancer prevention, detection and treatment;

*Establishment of a nationwide health network to bring cancer clinical trials to underserved communities;

*Investments to reduce the impact of smoking and promote smoking cessation; and

*A push to collect more data on cancers that strike military veterans and to provide more virtual care for veterans;

The Moonshot program also announced new commitments from non-governmental organizations to support people with cancer with out-of-pocket medication costs, stress management, smoking cessation, bring clinical trials to more diverse populations and help patients navigate the medical system, among other efforts.

Funding request

Government support has been crucial to the progress against cancer, but the cancer community worries Congress won't continue to generously fund scientific research. From 2010 to 2019,

(Continued on page 11.)



OCT 24-25	VS	IA PRE-SEASON TOURNEY	TBD	FRI, DEC 29	@	COLUMBUS CLASSIC	TBD
TUES, NOV 7	VS	INDIANOLA ACADEMY	4PM	THURS, JAN 4	VS	WINONA CHRISTIAN	3PM GIRLS B GAME-4PM
THURS, NOV 9	VS	CARROLL ACADEMY	3PM GIRLS B GAME-4PM	FRI, JAN 5	@	MANCHESTER ACADEMY	3PM GIRLS B GAME-4PM
MON, NOV 13	@	WINSTON ACADEMY	4PM	TUES, JAN 9	@	*BENTON ACADEMY	4PM
TUES, NOV 14	VS	MANCHESTER ACADEMY	3PM GIRLS B GAME-4PM	THURS, JAN 11	@	INDIANOLA ACADEMY	4PM
THURS, NOV 16	@	WINONA CHRISTIAN	3PM GIRLS B GAME-4PM	FRI, JAN 12	VS	*HUMPHREYS ACADEMY	4PM
MON, NOV 27	VS	NORTH DELTA ACADEMY	4PM	TUES, JAN 16	@	*DEER CREEK SCHOOL	4PM
TUES, NOV 28	@	NORTH SUNFLOWER	4PM	THURS, JAN 18	VS	*BENTON ACADEMY	4PM
THURS, NOV 30	@	TRI-COUNTY ACADEMY	3PM GIRLS B GAME-4PM	FRI, JAN 19	@	CARROLL ACADEMY	3PM GIRLS B GAME-4PM
TUES, DEC 5	VS	NORTH SUNFLOWER	4PM	MON, JAN 22	@	*HUMPHREYS ACADEMY	4PM
THURS, DEC 7	VS	TRI-COUNTY ACADEMY	3PM GIRLS B GAME-4PM	TUES, JAN 23	VS	COLUMBUS CHRISTIAN	5PM V
FRI, DEC 8	VS	*DEER CREEK SCHOOL	4PM	JAN 25-26	@	*JV DISTRICT TOURNEY DEER CREEK SCHOOL	TBD
THURS, DEC 14	@	NORTH DELTA ACADEMY	4PM	FEB 1 & 3	@	*DISTRICT TOURNAMENT CENTRAL HOLMES	TBD

*INDICATES DIVISION GAMES. ALL DATES WILL BE JV GIRLS, JV BOYS, V GIRLS, & V BOYS UNLESS OTHERWISE NOTED