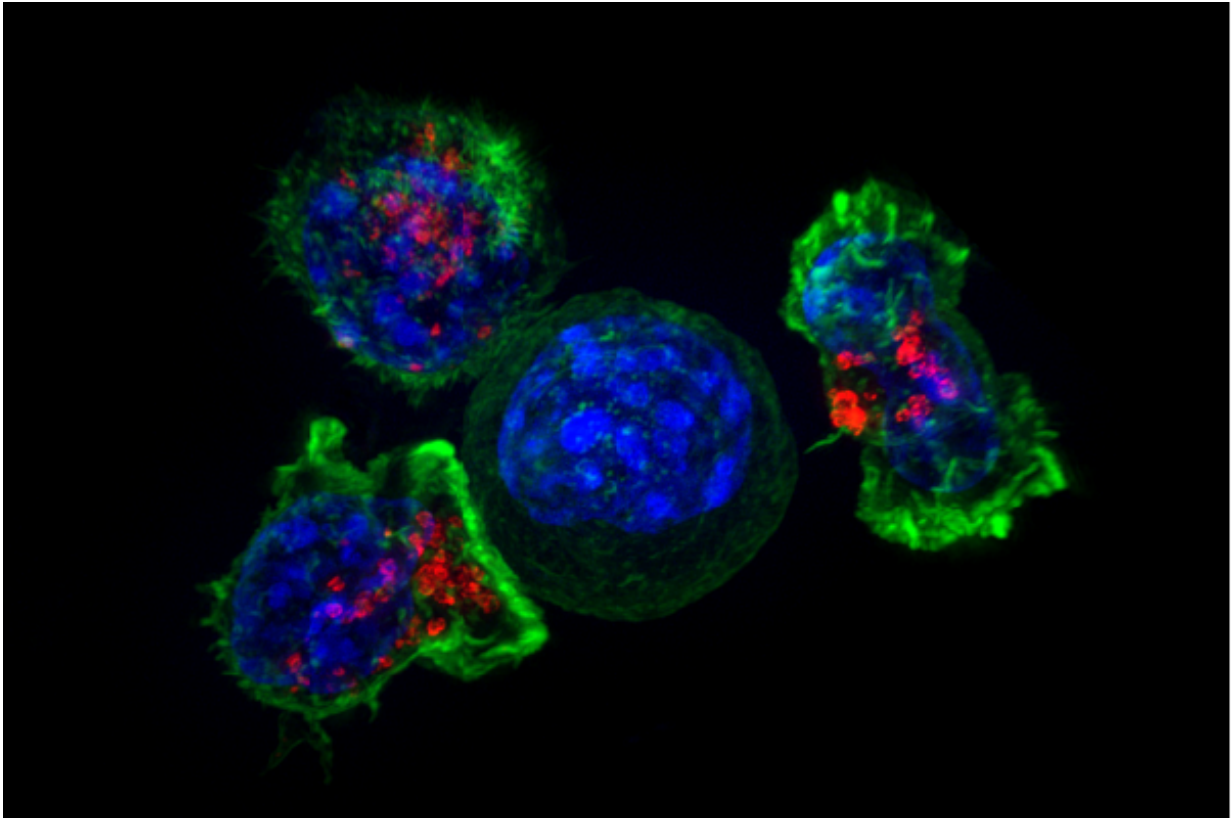


Second cancers deadlier in young patients

April 20 2017



Killer T cells surround a cancer cell. Credit: NIH

Second cancers in children and adolescents and young adults (AYA) are far deadlier than they are in older adults and may partially account for the relatively poor outcomes of cancer patients ages 15-39 overall, a new study by UC Davis researchers has found.

The study also found that survival after almost all types of cancer is much higher when the cancer occurs as a primary malignancy than if it is a second cancer, and these survival differences are most pronounced in [patients](#) under age 40. The article, entitled "Second Primary Malignant Neoplasms and Survival in Adolescent and Adult Cancer Survivors," is published today in *JAMA Oncology*.

Based on an analysis of more than 1 million [cancer patients](#) of all ages from throughout the U.S., the study is the first to compare survival after a second cancer to survival of the same cancer that occurs as the first primary malignancy, by age. Researchers hope the findings help guide clinicians in providing age-specific recommendations on cancer prevention, screening, treatment and survivorship, especially among the AYA population for whom survival rates have not improved to the same extent as they have for children and older adults.

"Although the increased incidence of second cancers is well known among cancer survivors, less is known about outcomes of these cancers or the influence of age," said Theresa Keegan, a cancer epidemiologist at the UC Davis Comprehensive Cancer Center and the study's lead author.

Keegan and colleagues at UC Davis, Oregon Health and Science University and the John Wayne Cancer Institute identified all patients diagnosed with only one or a first and second malignancy during 1992 through 2008 using Surveillance, Epidemiology and End Results (SEER) program data collected from 13 cancer registries. The researchers were careful not to capture recurrences of the same cancer when identifying secondary malignancies.

The authors collected data on the 14 most common [cancer types](#) that affect AYAs: female breast, thyroid, testicular, Hodgkin lymphoma, non-Hodgkin lymphoma, acute lymphoblastic leukemia, [acute myeloid leukemia](#), soft tissue sarcoma, bone sarcoma, colorectal, central nervous

system, cervical and ovarian cancer.

Overall, children and AYAs had an 80 percent chance of surviving five years after a diagnosis of a first cancer. But if the same cancer occurred as a secondary malignancy, 5-year survival dropped to 47 percent for children and 60 percent for the AYA population. The differences in survival were not nearly as marked in the older adult population, who had a 70 percent chance of surviving five years overall for a first cancer and 61 percent for a new, second malignancy.

When the researchers looked at 5-year survival by age and individual cancer types, they found striking differences depending on whether it was a first or secondary malignancy in all but two of the 14 cancer types, testes and melanoma.

"For almost every type of cancer, the AYA population did worse with a secondary cancer," said Melanie Goldfarb, an endocrine surgeon at John Wayne Cancer Institute and co-author on the study. "What struck us was that the second cancer caused such an increased risk of death."

For example, AYA patients diagnosed with acute myeloid leukemia as a first cancer had a 57 percent chance of surviving for five years, but that dropped to 29 percent if it was the second cancer. For AYA patients diagnosed with breast cancer, the 5-year survival was 81 percent for a first cancer but 63 percent if it was a second cancer.

Why younger patients tend to fare worse than older patients with the same second cancers is not fully understood or specifically addressed in the current study, the authors said.

Keegan said an explanation for worse outcomes may be that those with a secondary cancer have a worse response to treatment, limitations on the types or doses of treatments that they can receive as a result of their

prior cancer treatment or impaired physiologic reserves that impact their ability to tolerate treatment.

Goldfarb added that psycho-social issues may play an important role, or combine with other factors such as an underlying biological condition that predisposes someone to cancer.

"These younger people don't have all the support or resources they need," she said. "They may not have adequate insurance, or they may get lost in the system. They may suffer from depression, which can contribute to their overall health and worsen their cancer outcome."

The authors plan next to examine how the time between getting a first and second cancer affects survival and whether the type of treatment for the first cancer influences the outcome of a second [cancer](#).

More information: Second Primary Malignant Neoplasms and Survival in Adolescent and Adult Cancer Survivors, *JAMA Oncology* (2017). jamanetwork.com/journals/jamao.../jamaoncol.2017.0465

Provided by UC Davis

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