

Risk of second cancer in cancer survivors mainly confined to the same cancer type as the first

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Cancer survivors have more than double the risk of a second primary cancer of the same type, according to a study published in *CMAJ* (*Canadian Medical Association Journal*), whereas the risk of a second primary cancer of another type was only slightly elevated.

Danish researchers looked at data for the entire population of Denmark (7 493 705 people) from 1980 to 2007 to determine whether the risk of secondary cancer is linked to the type of cancer found in the first instance. About 10% — 765 255 people — had one or more diagnoses of primary cancer for a total of 843 118 diagnoses.

About 15% of cancer survivors worldwide are diagnosed with a second primary cancer.

The researchers found a 2.2-fold risk of a second primary cancer of the same type as the first in [cancer survivors](#). The risk of a different type of second primary cancer was 1.1-fold. Risk varied depending on the type of cancer. The risk of a second cancer of the same type was reduced after prostate cancer and greatest after sarcoma. The risk of a second cancer of a different type was also reduced after prostate cancer and greatest after larynx cancer.

To understand the association between cancers, the researchers produced a table containing estimates of risk for all 27 cancers after all 27 first

cancer types. They suggest that this catalogue might be valuable to further cancer studies.

"The striking contrast between the 2.2-fold increased risk of a second primary cancer being the same type as the first and the 1.1-fold increased risk of it being different from the first cancer suggests that characteristics of the individual patient were involved," writes Dr. Stig Bojesen of Herlev Hospital, Copenhagen University Hospital and the University of Copenhagen, with coauthors. "The risk of a second primary cancer seems to be specific to cancer type and is probably driven by the patient's genetic and lifestyle risk factors."

They also looked at the association of the first cancer to smoking because it is known to increase the risks of many types of cancer. "We were surprised to see that in our study, the risk of other smoking-related cancers in patients surviving a smoking-related cancer was only 1.2-fold," said Dr. Bojesen. "The good news is that in the individual cancer survivor, the [increased risk](#) of a new cancer is mainly confined to the same cancer as the first — even in people with an unhealthy lifestyle such as smoking."

"We speculate that in general, risk factors acting over the long term seem to be type specific in the individual patient," write the authors. "However, other explanations are also plausible: effects of treatment and an increase (or decrease) in diagnostic surveillance could change observed risk of cancer in the same organ as opposed to other organs."

"Future studies of individual pairs of first and second primary cancers should clarify whether the association is due to shared genetic or lifestyle risk factors, codiagnosis of a primary cancer in close anatomic proximity to the first cancer, treatment of the first cancer or the timing of the diagnosis of the first cancer (in childhood v. adulthood)," the authors conclude.

In a related commentary, Dr. Marcy Winget from Alberta Health Services and coauthor write, "Nielsen and colleagues found that the risk of a second primary cancer depended greatly on the types of the first and second cancers; heterogeneity in risk was substantial across cancer types, regardless of whether the second [cancer](#) was the same type as the first." They point out that this significant heterogeneity requires looking at risk for specific cancers by paired first and second cancers rather than overall risk.

"Caution must be exercised, however, in interpreting the findings for implications for clinical practice, in view of the substantial heterogeneity in risk."

Provided by Canadian Medical Association Journal

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