

Genetic consequences of cancer treatmentJ. Tawn^a, J. Winther^b, N. Malila^c, M. Stovall^d and J. Boice^e

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Although radiation is a well established mutagen in germ and somatic cells, to date epidemiological studies have demonstrated no convincing or consistent evidence for radiation-induced germ cell mutations resulting in genetic disease in offspring. The Genetic Consequences of Cancer Treatment (GCCT) study is a large-scale retrospective cohort study of the offspring of survivors of childhood and early-onset cancer, the objective of which is to determine the extent to which curative therapies, including radiation, contribute to adverse health outcomes or other inherited effects i.e. cancer, birth defects, stillbirths, neonatal and all other premature deaths. The study is unique in that it examines risk in relation to well established testes and ovarian doses. Gonadal doses cover a wide range and approach the maximum possible without causing infertility. Good outcome ascertainment is possible using the extensive Danish and Finnish registries. Approximately 19000 children of cancer survivors and 50000 children of the survivors' siblings are being evaluated for adverse pregnancy outcomes. 100 families are providing blood samples for storage of DNA and viable lymphocytes. These are being used to study genetic markers of cancer susceptibility and the induction of minisatellite mutations. Because of the wide dose range, results from this study will provide valuable information on radiation genetic risk and cancer susceptibility for counseling cancer survivors as well as relevant information for those encountering occupational radiation.

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