How to Use this Factsheet

This risk factor summary was developed to serve as a general fact sheet. It is an overview and should not be considered exhaustive. For more information on other possible risk factors and health effects being researched, please see the References section.

A risk factor is anything that increases a person's chance of developing cancer. Some risk factors can be controlled while others cannot. Risk factors can include *hereditary conditions*, *medical conditions or treatments*, *infections*, *lifestyle factors*, or *environmental exposures*. Although risk factors can influence the development of cancer, most do not directly cause cancer. An individual's risk for developing cancer may change over time due to many factors, and it is likely that multiple risk factors influence the development of most cancers. Knowing the risk factors that apply to specific concerns and discussing them with your health care provider can help to make more informed lifestyle and health care decisions.

For cancer types with environmentally-related risk factors, an important factor in evaluating cancer risk is the route of exposure. This is particularly relevant when considering exposures to chemicals in the environment. For example, a particular chemical may have the potential to cause cancer if it is inhaled, but that same chemical may not increase the risk of cancer through skin contact. In addition, the dose and duration of time one might be exposed to an environmental agent is important in considering whether an adverse health effect could occur.

Gene-environment interactions are another important area of cancer research. An individual's risk of developing cancer may depend on a complex interaction between their genetic make-up and exposure to an environmental agent (for example, a virus or a chemical contaminant). This may explain why some individuals have a fairly low risk of developing cancer as a result of an environmental factor or exposure, while others may be more vulnerable.

Key Statistics

Multiple myeloma is a cancer of the plasma cells, which produce antibodies that circulate in the blood to help fight disease and are mainly found in the bone marrow. Multiple myeloma is relatively uncommon. The American Cancer Society estimates 26,850 individuals will be diagnosed with multiple myeloma in the U.S. in 2015: 14,090 men and 12,760 women.[1, 2] In Massachusetts, it accounted for 1.2% of all cancers between 2007 and 2011[5]. Men are slightly more likely to develop multiple myeloma than women.[1] For unknown reasons, multiple myeloma is about twice as common among African Americans as whites.[1, 4, 6] The onset of the disease generally occurs later in life, most commonly in people over 60 years old. Only 2% of diagnoses occur in people under 40.[4]

Established Risk Factors

The exact causes of multiple myeloma remain largely unknown, however, a number of potential risk factors have been suggested.

Medical Conditions

Pre-existing medical conditions such as monoclonal gammopathy of undetermined significance (MGUS) and solitary plasmacytoma increase the likelihood of developing multiple myeloma. MGUS is a condition in which abnormal plasma cells produce excess amounts of antibody protein. Solitary plasmacytoma is a single tumor that develops in bone marrow or other tissue.[1, 4, 7]

Environmental Exposures

Although it accounts for a very small number of diagnoses, exposure to ionizing radiation has been associated with multiple myeloma.[1] Increases in the incidence of multiple myeloma among atomic bomb survivors have provided the most evidence of an association between radiation exposure and this cancer.[7]

Possible Risk Factors

Hereditary Conditions

The occurrence of multiple myeloma among family members suggests that family history may play a role in the development of this cancer[1, 4]. Several studies have found that the risk of multiple myeloma was elevated for subjects who reported that a first-degree relative (parent or sibling) had the disease. However, this link is controversial.[7]

Medical Conditions

Some autoimmune diseases and certain chronic inflammatory conditions such as rheumatoid arthritis, pernicious anemia and systemic lupus erythematosus (SLE, or lupus) appear to be associated with an increased risk of multiple myeloma.[7]

Infections

Specific viral infections, particularly those that cause immunosuppression such as human herpesvirus-8 (HHV-8) or hepatitis C (HCV), may play a role in the risk of multiple myeloma.[7]

Lifestyle Factors

An increased risk of multiple myeloma has recently been linked to obesity.[1, 7]

Environmental Exposures

Certain occupational exposures have been suggested to carry an increased risk of multiple myeloma, including occupational exposure to benzene, paint-related occupations, petroleum-related occupations, and agricultural occupations, presumably due to exposures to pesticides. [7]

Other Risk Factors That Have Been Investigated

Lifestyle Factors

Of many studies that have investigated tobacco use in relation to multiple myeloma risk, only one found consistent evidence for an increased risk among smokers. Although use of permanent dark hair dye was previously suggested to be a risk factor for multiple myeloma, recent studies indicate that it is unlikely to be a major contributor to the incidence of this cancer.[7]

Multiple Myeloma in Children

Only 2% of individuals diagnosed with multiple myeloma are younger than age 40.[4]

For More Information / References

Much of the information contained in this summary has been taken directly from the following sources. This material is provided for informational purposes only and should not be considered as medical advice. Persons with questions regarding a specific medical problem or condition should consult their physician.

American Cancer Society (ACS). http://www.cancer.org

1. ACS. 2015. Detailed Guide: Multiple Myeloma.
2. ACS. 2015. Cancer Facts & Figures 2015.
3. ACS. 2014. Fact Sheet: Hair Dyes.

American Society of Clinical Oncology (ASCO). http//www.cancer.net

4. ASCO. 2014. Guide to Multiple Myeloma.

Massachusetts Cancer Registry (MCR), Massachusetts Department of Public Health.

5. MCR. 2014. Cancer Incidence and Mortality in Massachusetts 2007-2011: Statewide Report. Available at: http://www.mass.gov/eohhs/docs/dph/cancer/state/registry-statewide-report-07-11.pdf

National Cancer Institute (NCI). http://www.cancer.gov/research/progress/snapshots/myeloma

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7. De Roos AJ, Baris D, Weiss NS, Herrinton LJ. 2006. Multiple Myeloma. In: Cancer Epidemiology and Prevention. 3rd Ed, edited by Schottenfeld D, Fraumeni JF. New York: Oxford University Press: P. 919-945.