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### Non-Hodgkin's Lymphoma

Sir Mix-a-Lot's "Baby Got Back" is undoubtedly one of the greatest hip hop songs of the 90s sharing a message of self love for women on the thicker side. While Sir Mix-a-Lot was accurate in his statement "Fonda ain't got a motor in the back of her Honda", Mix-a-Lot had not considered Fonda is thick in an area most women aren't — her lymph nodes. In early September of this year, Jane Fonda was diagnosed with Non-Hodgkin's Lymphoma which is a cancer in the lymphatic system causing swollen lymph nodes.

As stated previously, non-Hodgkin's lymphoma causes swollen lymph nodes in the neck, armpits, and groin. Other symptoms include abdominal pain or swelling, chest pain, trouble breathing, coughing, persistent fatigue, fever, night sweats, and unexplained weight loss. Not much is known about why non-Hodgkin's lymphoma appears in the body but it begins when the body begins to produce too many abnormal lymphocytes. These abnormal lymphocytes do not die resulting in crowding in the lymph nodes leading to swollen lymph nodes. Non-Hodgkin's lymphoma can also spread to other parts of the lymphatic system which includes the lymphatic vessels, adenoids, tonsils, thymus, spleen, and bone marrow.

Some risk factors for non-hodgkin's lymphoma include the use of immunosuppressants, infections with certain viruses like HIV or Epstein-Barr, infections with certain bacteria like

*Helicobacter pylori*, chemicals used to kill weeds and insects such as RoundUp, and older age after the age of 60. Despite these risk factors increasing chances of developing non-Hodgkin's lymphoma, people with these risk factors rarely develop it and there aren't many obvious risk factors. Non-Hodgkin's is more common in men where one in 42 men will develop non-Hodgkin's compared to one in 52 women, this cancer is also common.

While having family history with non-Hodgkin's lymphoma can increase one's chances of developing the disease, you are more likely to develop the disease throughout life rather than through inheritance. Gene changes that can cause non-Hodgkin's lymphoma can occur through exposure to radiation, cancer-causing chemicals, or infections. One gene involved in the development of non-Hodgkin's lymphoma is CASP10 (601762) which is involved in apoptosis, a mutation within this gene will cause programmed cell death to not occur in lymphocytes resulting in non-Hodgkin's lymphoma.

Some ways to diagnose non-Hodgkin's lymphoma are physical examination, blood and urine tests, imaging tests (CT, MRI, PET), lymph node tests, bone marrow tests, and a spinal tap test. A physician will search for swollen lymph nodes, spleen, or liver when diagnosing non-Hodgkin's lymphoma. They may also test your bone marrow by injecting a needle into your hip bone to remove a sample of bone marrow. They may also need to test your spinal fluid in a spinal tap by inserting a needle in the lower back.

Treatment depends on whether or not the lymphoma comes from the B cells or the T cells will determine the way non-Hodgkin's is treated. CAR-T therapy can be used to fight non-Hodgkin's using the body's T cells by extracting them and engineering them to fight cancer and inserting them back into the body. This type of therapy is mainly used in non-Hodgkin's that

arise in the T cells but can also be used in B cell type non-Hodgkin's if other forms of therapy are not effective.

Other forms of therapy include chemotherapy, radiation therapy, tested drug therapy, and immunotherapy. Chemotherapy is a drug therapy that is directed towards killing fast growing cells and is most commonly used for initial treatment in non-Hodgkin's. Radiation therapy uses x-rays and protons to target cancer cells; it may be the only treatment needed if the non-Hodgkin's is limited to only one or two spots. Tested drug therapy focuses on using treatment to kill abnormal cells and is usually combined with chemotherapy. Immunotherapy utilizes the immune system to fight non-Hodgkin's by interfering with the immune system not attacking abnormal cells due to the proteins they create, immunotherapy is typically used if other options have not worked. Bone marrow transplants are also an option by using chemotherapy and radiation to suppress the body's bone marrow and immune system and infusing healthy bone marrow either from the body or from a donor to rebuild bone marrow. Bone marrow transplants are typically performed when other treatments have been ineffective.

### Works Cited

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