

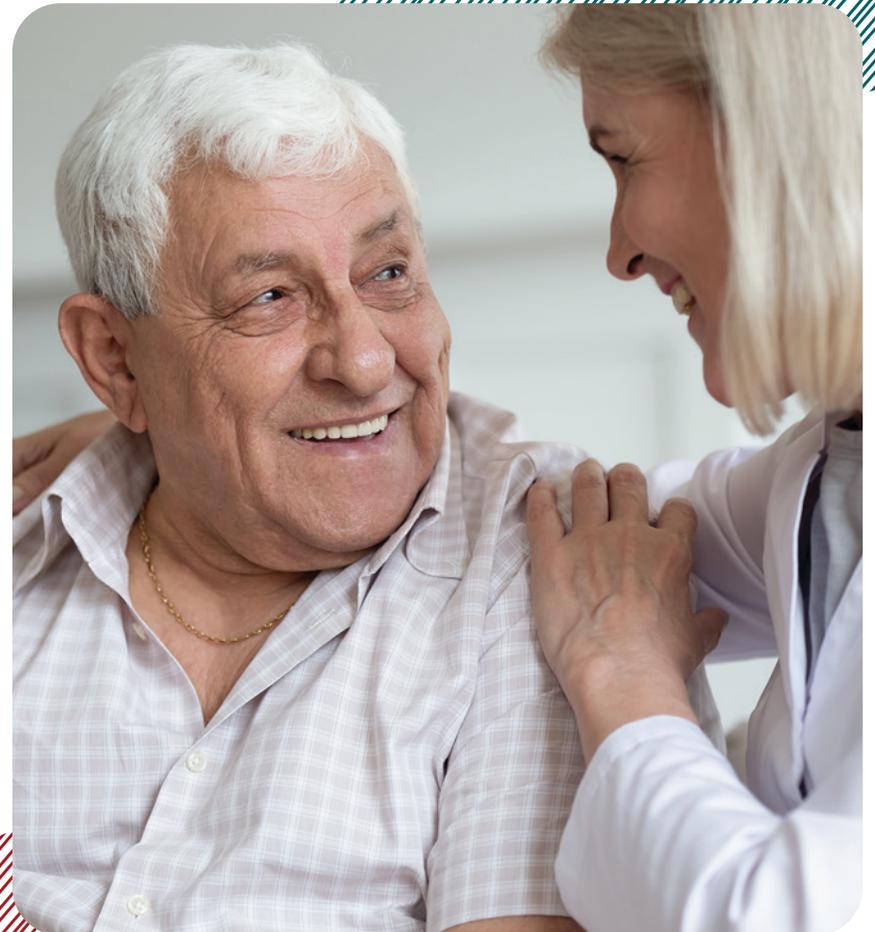
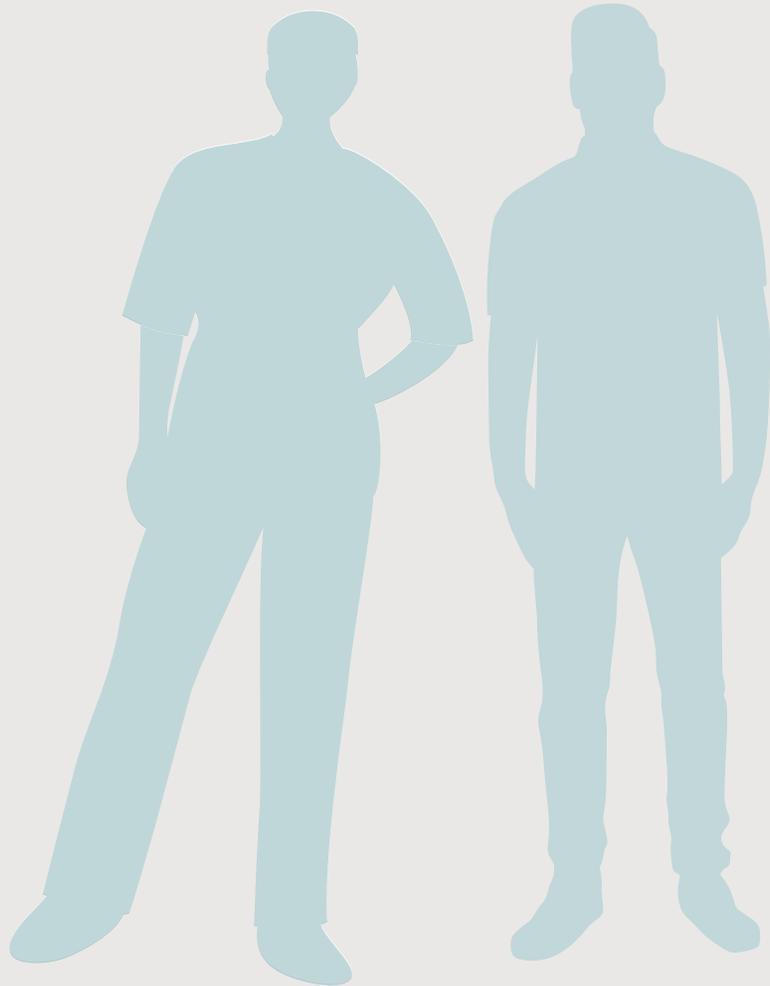
Understanding and managing
**non-Hodgkin
lymphoma (NHL)**



What is this booklet for?

This booklet was designed to answer some questions you may have about NHL. It summarizes the treatment options that are available in Canada. It can also serve as a starting point for discussions with your doctor, so that you can decide together what is best for you.

Once you have a better understanding of each treatment option, you can stay informed and take an active role in your NHL treatment process.



What is NHL?

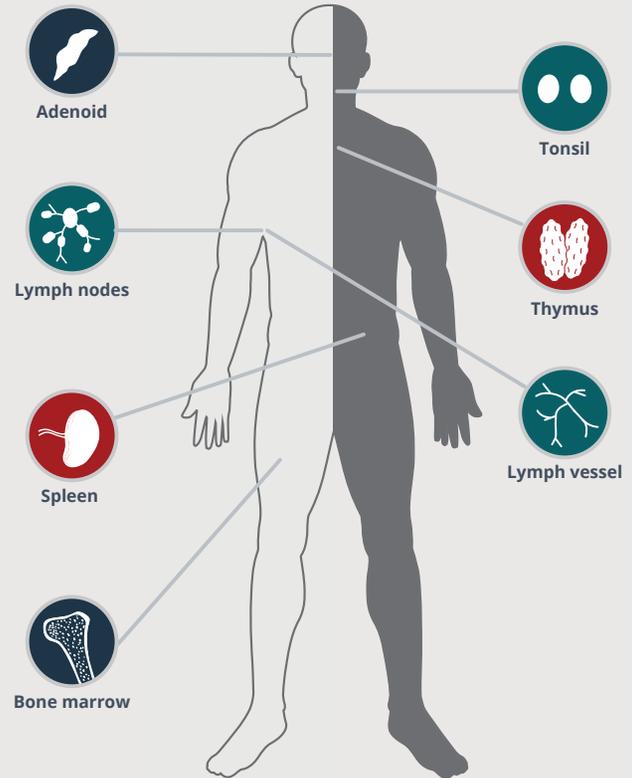
“**Lymphoma**” is a general term for a group of blood cancers that originate in the **lymphatic system**. The lymphatic system is part of the body’s immune system.

It is made up of tissues and organs that produce, store and carry white blood cells throughout the body to fight infections and diseases.

- NHL is the term for **a diverse group of blood cancers** that share a single characteristic: they all arise from **lymphocytes**.
- Lymphocytes are white blood cells that are part of the body’s immune system.
 - There are three main types of lymphocytes: **B cells, T cells and natural killer (NK) cells**.
 - In lymphoma, a lymphocyte undergoes a malignant (cancerous) change and then multiplies, eventually crowding out healthy cells and forming tumours.
- These tumours generally develop in the lymph nodes or in lymphatic tissue found in organs such as the stomach, intestines or skin.
- In some cases, NHL involves blood and the bone marrow (the spongy tissue inside of bones where blood cells are formed).
- Lymphoma cells may develop in just one place or in many areas in the body.

NHL includes more than 60 subtypes.

NHL and the lymphatic system



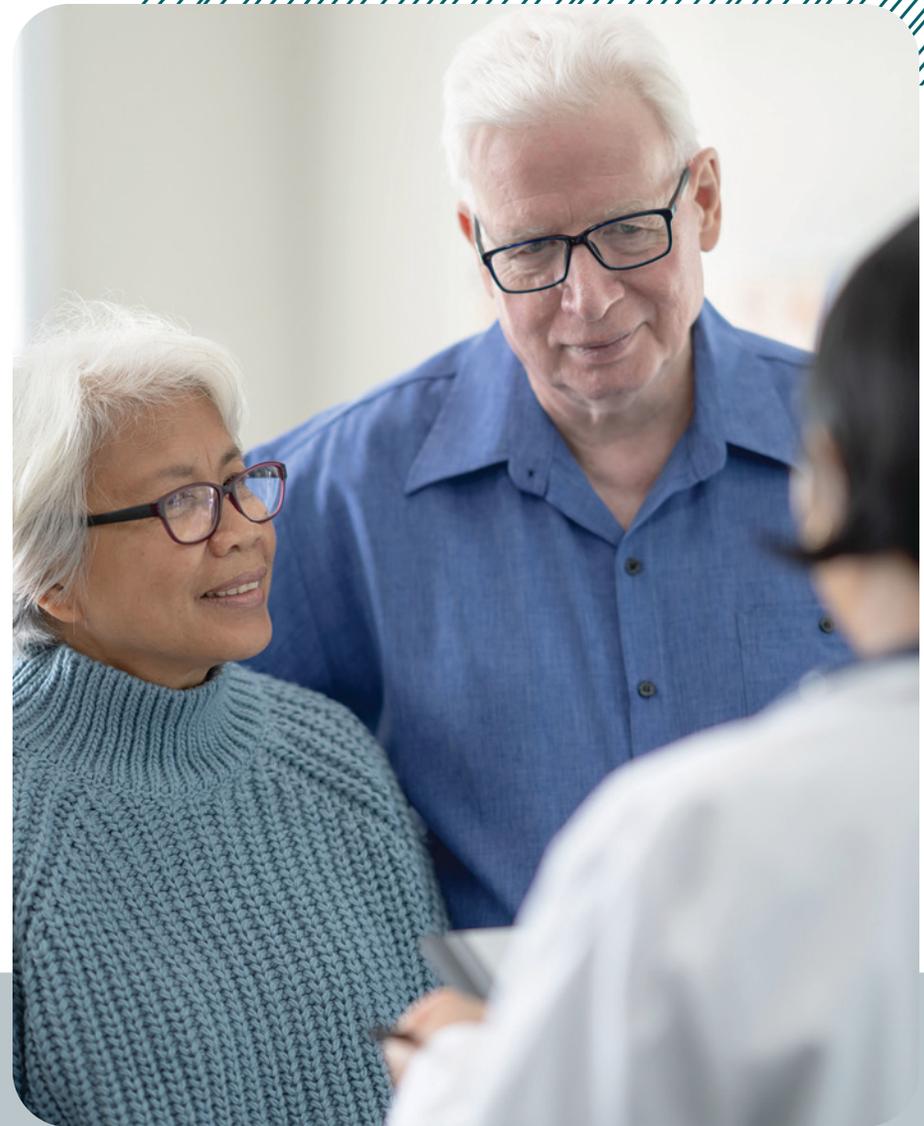
It is estimated that in 2022, 11,400 Canadians will be diagnosed with NHL.

What are the types of NHL?

There are **more than 30 different types** of NHL, which are grouped based on the type of lymphocyte they started from. Most types of NHL start in B cells and are called **B-cell lymphoma**. NHL can also start in T cells, which is called **T-cell lymphoma**. NHL that starts in NK cells is also grouped under T-cell lymphomas.

Each type of NHL looks different under a microscope. They also develop and grow differently. The grade of NHL is based on how different, or abnormal, the lymphoma cells look compared to normal lymphocytes. The grade gives doctors an idea of how slowly or quickly the NHL will likely grow and spread. NHL is usually divided into **2 grades**:

- **Indolent (low-grade) NHL** means that the cancer cells look and act much like normal cells. These NHLs **tend to grow slowly**.
- **Aggressive (high-grade) NHL** means that the cancer cells look and act less normal, or more abnormal. These NHLs **tend to grow quickly**.



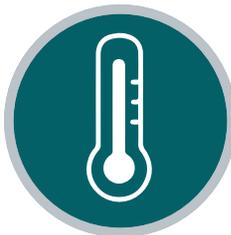
What are the signs and symptoms of NHL?

The signs and symptoms of NHL can be similar to other less serious diseases. Some people have no symptoms, and their disease is uncovered during a routine medical examination. Some of the signs and symptoms that you may experience are listed below:



Large masses in the neck or abdomen and/or painless swelling in one or more lymph nodes

- When your lymph nodes are enlarged or swollen



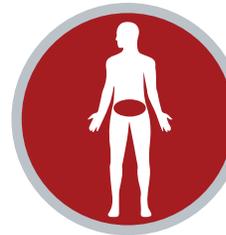
Fevers and drenching night sweats

- Possibly a response from your immune system



Ongoing fatigue, loss of appetite, pain in the abdomen

- If your NHL is in the stomach or bowel



Feeling bloated or full

- When your lymphoma cells cause your liver or spleen to enlarge



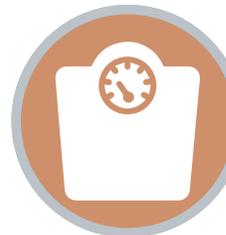
Cough or chest pain

- When your NHL is in the chest



Itchy skin, rash, or skin lumps

- This is a response from your immune system



Loss of appetite and significant weight loss

- When you are eating less or using more energy

What are the possible tests for NHL?



Blood tests

Blood tests are used to determine whether lymphoma cells are present in the blood; check for indicators of disease severity by examining blood protein levels; assess kidney and liver function; and measure important biological markers that are helpful indicators for several NHL subtypes. An example of a common blood test is a complete blood count (CBC) that measures different components of the blood. The results include counts of red blood cells, white blood cells and platelets.



Lymph node biopsy

Making an accurate diagnosis of the patient's specific subtype of NHL can be challenging. It requires an experienced hematopathologist (a doctor who specializes in diagnosing diseases of the blood and marrow) to prepare the tissue samples from a biopsy, the procedure used to obtain a sample of lymph node tissue. The hematopathologist uses a powerful microscope to examine a sample of the tumour or lymph node for the size, shape, and arrangement of the lymphoma cells.



Immunophenotyping

A technique used to distinguish NHL from other types of lymphoma or other cancerous or noncancerous conditions. The hematopathologist looks for the presence of certain antigens or markers on the surface of the cells in a blood or bone marrow sample in order to identify lymphoma cells and confirm the diagnosis. Immunophenotyping can further help determine whether the lymphoma cells are B cells, T cells or NK cells.



Flow cytometry

In this technique, cells are taken from the blood or tissue biopsy sample and put in a machine that detects which proteins (also called "markers" or "antigens") are expressed in the lymphoma cells.



Fluorescence *in situ* hybridization (FISH)

This lab test looks at genes and chromosomes in your cells to find lymphoma cells. It uses special dyes to identify abnormalities in chromosomes called "mutations," such as translocations and deletions. Chromosomal abnormalities are important considerations in identifying specific subtypes of NHL and choosing the most effective treatment approach.

DNA is the material that carries all the information about how our bodies look and function. Each piece of information is carried on a different section of the DNA and these sections are called "genes." Genes tell a cell how to make a specific protein, which is used by the cell to grow and survive. DNA is organized into tightly coiled thread-like bundles called "chromosomes" that contain thousands of genes. Some changes, called "mutations," can happen in your genes.



Imaging tests

Imaging is a very important part of the staging and management of NHL. Imaging tests like computed tomography (CT) and positron emission tomography (PET) scans take pictures that let your doctor see where your NHL is, how it has spread, what size it is, and if other organs are involved.



What are the possible tests for NHL?

CT scan

- A CT scan uses special x-ray equipment to take multiple images from different angles around the body.
- Patients undergo CT scans of the neck, chest, abdomen and pelvis.
- A CT scan can show whether there is involvement of the lungs, liver and/or other organs, which is helpful staging information.
- A CT scan can also show where the lymphoma is located and can measure the size of the mass.

PET-CT scan

- This procedure combines a PET scan with a CT scan to obtain a more detailed image of areas inside the body than either scan can produce alone.
- A PET scan is an imaging technique that produces a 3D image of functional processes in the body.

Magnetic resonance imaging (MRI) scan

- An MRI scan is done in select cases for NHL staging.
- It uses a powerful magnet and radio waves linked to a computer to create clear and detailed cross-sectional images (slices) of the body.
- The images can then be displayed on a video monitor and also saved on a disk for future analysis.

What are the stages of NHL?

Identifying the stage of your disease is an important step to planning your treatment. The stage of lymphoma refers to **where your disease is located and the extent of the disease in your body**. It does not determine how well you will respond to treatment.

Your doctor will determine the stage of your disease using imaging, lab tests, and physical examination. This helps figure out:

- Your NHL subtype
- Which lymph nodes are larger than normal
- Whether your disease affects organs other than your lymph nodes
- If you have large masses of tumour

Now let's take a look at the various stages of NHL.

Stage I	Involves one group of lymph nodes.
Stage II	Involves two or more groups of lymph nodes on the same side of your diaphragm.
Stage III	Involves groups of lymph nodes on both sides of your diaphragm.
Stage IV	Involves one or more organs that are not part of a lymphatic area and/or your lymph nodes. Or it may involve the liver, bone marrow, or lungs.

The following letters may be added to your stage:

Category E	Means your lymphoma has spread to areas or organs outside of your lymph nodes or to tissues beyond your major lymphatic areas.
Category S	Means your testing has found lymphoma in your spleen.
Category X	Means your testing has shown large masses of lymphocytes (bulky disease).

How is NHL treated?

Factors affecting treatment choice for NHL

People with NHL should discuss treatment options with their doctor and ask for help to understand the benefits and risks of different treatment approaches. Your treatment plan is based on:

- The subtype of NHL – knowing whether the lymphoma cells are related to T cells, B cells or NK cells gives the doctor important clues about appropriate treatments.
- The stage and category of the disease.
- The presence or absence of fever, drenching night sweats and loss of more than 10 percent of body weight over 6 months, referred to as “B symptoms.”
- Whether there is lymphoma in areas of the body outside of the lymph nodes (extranodal involvement).
- Other prognostic factors, such as age and any underlying medical conditions.

After considering the above factors and assessing the stage of NHL, your doctor will recommend one or more of the treatment options listed on pages 15–18.

What treatment options are available for NHL?

Not everyone with NHL receives the same treatment. Various factors (listed on the previous page) will help your doctor determine the treatment that is most appropriate for you. Speak with your doctor to help you make informed decisions.

Now let’s take a closer look at the available NHL treatment options.

Treatment options for NHL based on type

Indolent NHL

The treatments offered depend on if the indolent NHL is **limited-stage (stage I or stage II)** or **advanced-stage (stage III or stage IV)**.

Limited-stage indolent NHL

Active surveillance

- An indolent NHL may not need to be treated right away because it is growing slowly.
- There may be long periods of time when there is no change.
- Active surveillance may be offered to some people who do not have symptoms.
- Your medical team watches your NHL closely and uses tests to check if the NHL is progressing or your condition is getting worse.
- They start treatment when the NHL progresses and causes symptoms.

Radiation therapy

- **External beam radiation therapy (EBRT)** is used most often when only one or a few groups of lymph nodes have lymphoma cells in them.
- It is also called **involved field radiation therapy (IFRT)** because it is given to the affected areas.
- It may also be given to nearby lymph nodes.

Chemotherapy

- This may be a treatment option if someone cannot have radiation therapy because all of the NHL cannot be included in the radiation field and it is causing symptoms.
- Single drugs may be used, but a combination of chemotherapy drugs is usually given.

What treatment options are available for NHL?

Advanced-stage indolent NHL

Active surveillance

- This may be offered to some people who do not have symptoms.
- As with limited-stage indolent NHL, treatment is given when the NHL changes and causes symptoms.

Chemotherapy

- This is given for advanced-stage indolent NHL that causes symptoms or seems to be progressing.
- Drugs may be given alone, but a combination of drugs is usually given.

Targeted therapy

- Targeted drugs are different from standard chemotherapy drugs, which work by attacking rapidly growing cells.
- These may work in some cases where chemotherapy doesn't.
- Rituximab is the targeted therapy used most often.
- Rituximab may be given alone, but it is usually given with chemotherapy.

Aggressive NHL

The treatments offered depend on if the aggressive NHL is **limited-stage (stage I or stage II)** or **advanced-stage (stage III or stage IV)**.

Limited-stage aggressive NHL

Chemotherapy

- This is usually the main treatment.
- A combination of chemotherapy drugs is usually given along with targeted therapy.
- Radiation therapy is often given as well.
- If radiation therapy is going to be given after chemotherapy, fewer cycles of chemotherapy may be needed.

Targeted therapy

- Rituximab is the targeted therapy given most often.
 - It is used in combination with chemotherapy.

Radiation therapy

- Some people may be offered EBRT.
- It is also called IFRT because it is given to areas where the NHL is found.
- Radiation therapy is usually given after chemotherapy.

What treatment options are available for NHL?

Advanced-stage aggressive NHL

Chemotherapy

- This is the main treatment.
- Different combinations of chemotherapy drugs are used for different types of aggressive NHL.
- The chemotherapy combination most often used is **CHOP**:
 - Cyclophosphamide
 - Doxorubicin
 - Vincristine
 - Prednisone
- When rituximab is added to CHOP, the chemotherapy combination is called **R-CHOP**.

Stem cell transplantation (SCT)

- Some types of aggressive NHL don't respond to standard doses of chemotherapy or there is a high risk that they will come back (recur) after treatment.
- Doctors may consider giving a higher dose of chemotherapy followed by SCT to treat some of these cases.

Radiation therapy

- EBRT may be offered for advanced-stage aggressive NHL.
- It is given after chemotherapy if the NHL is only in the part of the body where it started or has formed large tumours (called bulky disease) in certain areas of the body.

Joining a clinical trial can be a good option for you. A clinical trial is a type of research that studies a test or treatment in people. It gives people access to healthcare options that otherwise wouldn't be available. Ask your medical team if there is an open clinical trial that is right for you.

What else should you know about your NHL treatment?

Treatment side effects

- When you begin your treatment for NHL, you may experience mild to severe side effects, depending on your age, your overall health, and your treatment plan.
- Most side effects improve or resolve once your treatment ends.
- New drugs and therapies can help control side effects, such as nausea and vomiting.

Speak to your doctor if you are experiencing side effects.

Medical follow-up

- Medical follow-up is important after treatment for NHL.
- Your medical team should provide you with a care plan listing the frequency of follow-up visits and the tests you will have at those visits.

See your doctor to get follow-up care for possible early detection of heart disease, secondary cancers, and fertility problems.



What questions should you ask your doctor?



Being an active participant in your cancer care can give you and your family a greater sense of control. One way to achieve this is by building a relationship with your medical team based on open communication.

Consider bringing this list of questions to your next doctor's appointment.

Diagnosis

- What type of cancer do I have? From what type of cell did it form? Is this cancer common?
- What tests do you recommend for me?
- Where will the tests take place? How long will the tests take?
- How do I prepare for testing? How will the test be done? What can I expect?
- Do I need any other tests before we can decide on treatment?
- What is the cancer stage? Does this stage mean the cancer has spread far?

General treatment

- Can I just carefully monitor the cancer?
- Should I start treatment now? Why or why not?
- What should I do to be ready for treatment?
- How do my age, health, and other factors affect my options?
- What are my treatment options?
- Which one do you recommend for me? Why?
- What is the treatment frequency?
- What would we do if the treatment doesn't work or if the lymphoma comes back?
- What should be avoided or taken with caution while receiving treatment?
- What are my chances that the cancer will return?

Side effects of treatment

- What are the possible risks or side effects of my treatment? How serious are they and what should I report right away?
- What can be done to prevent or relieve the side effects of treatment?

Other considerations

- Can treatments be taken at home?
- How will treatment affect my daily activities?
- What if I miss a treatment?
- Are there any limits on what I can do?
- Should I still take the other medications I am on?
- Is it okay to continue with the supplements I am currently taking?
- What costs will I encounter?
- In cases of emergency, how can I reach your office on nights, holidays, or weekends?
- What type of follow-up will I need after treatment?

Be sure to write down any questions you have that are not on this list. For instance, you might want information about how you'll feel so that you can plan your work schedule. Or you may want to ask about qualifying for clinical trials.

What resource is available to you?



Visit our website to learn more about NHL and its treatment.

bloodcancers.ca

For more information, never hesitate to contact us. We're here to help you!

1 833 222-4884

info@bloodcancers.ca

Please download the LLS Health Manager™ app by visiting

bloodcancers.ca/health-manager-app

You can use this app to note down any questions that you may have to bring to your next doctor's appointment.



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