Understanding acute promyelocytic leukemia (APL)

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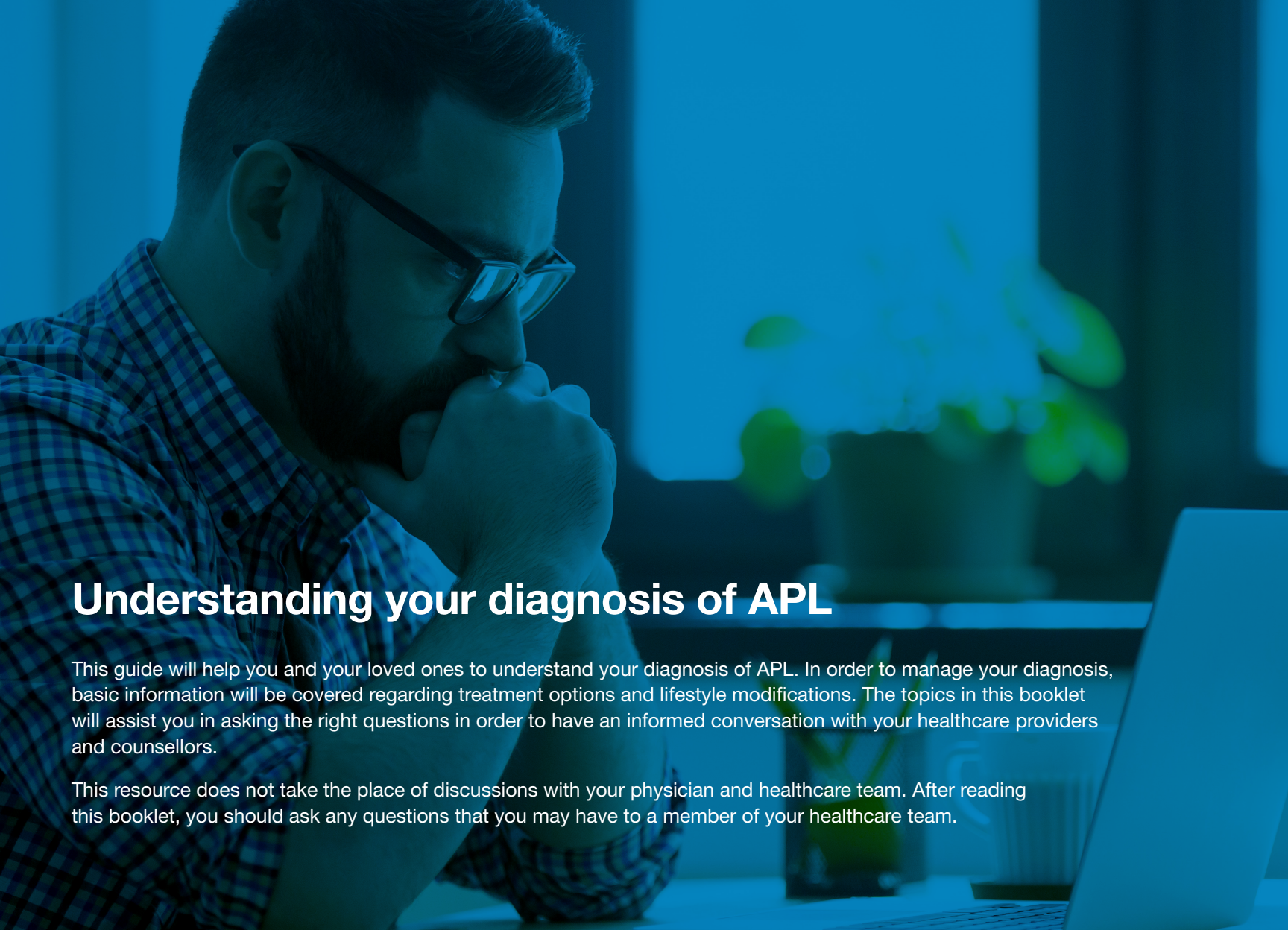
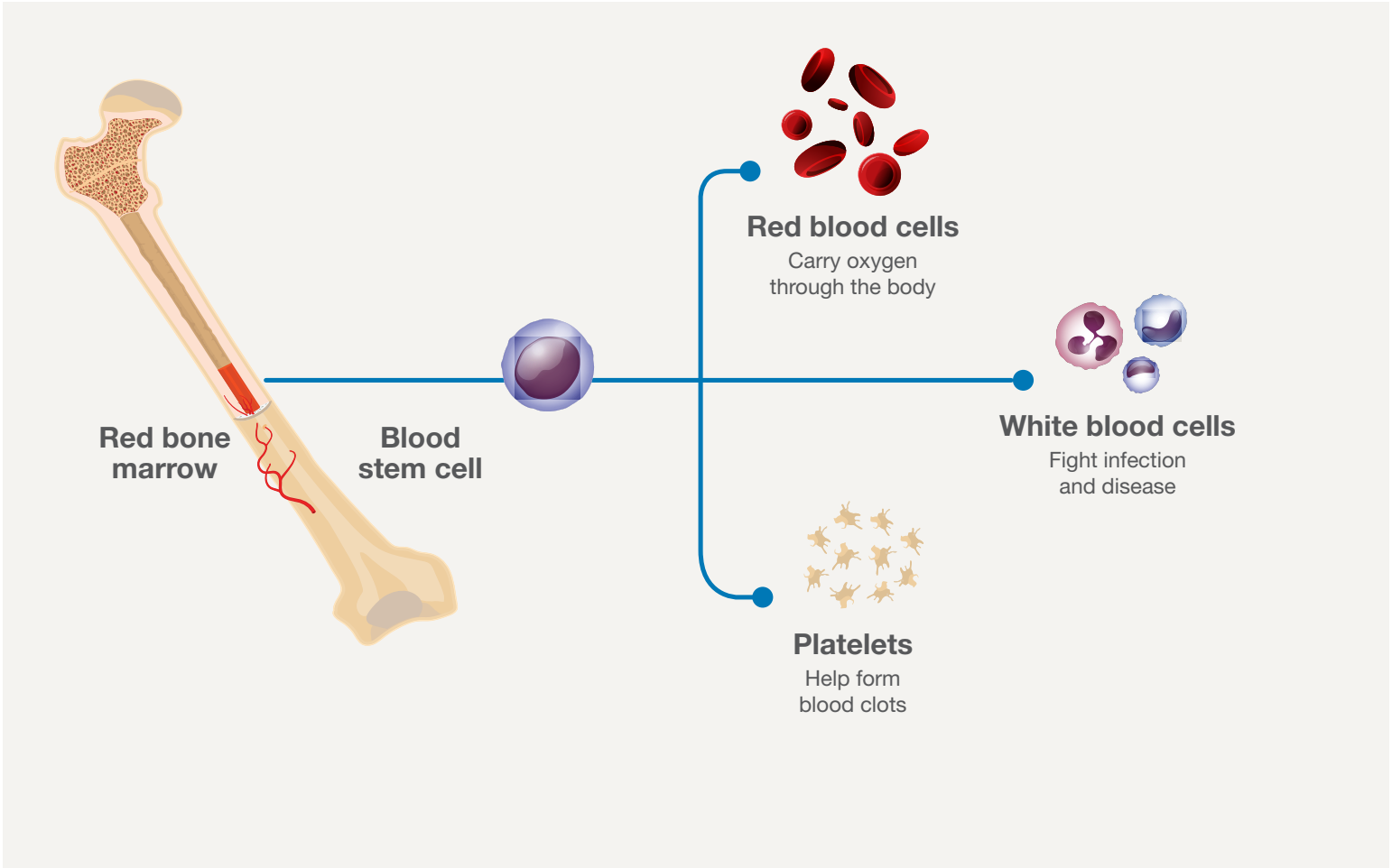


Understanding your diagnosis of APL

This guide will help you and your loved ones to understand your diagnosis of APL. In order to manage your diagnosis, basic information will be covered regarding treatment options and lifestyle modifications. The topics in this booklet will assist you in asking the right questions in order to have an informed conversation with your healthcare providers and counsellors.

This resource does not take the place of discussions with your physician and healthcare team. After reading this booklet, you should ask any questions that you may have to a member of your healthcare team.

Bone marrow and blood cell formation



Understanding APL

What is leukemia?

Bone marrow is the spongy tissue inside some of the bones in the body, including the hip and thigh bones. The bone marrow produces different types of cells: white blood cells, red blood cells and platelets. Normally, the bone marrow produces these cells by making blood stem cells (immature cells) which become mature blood cells over time.

Cancers are diseases of the cells where some of the body's cells begin to divide without stopping and spread into surrounding tissues. Leukemia is a cancer that may affect red blood cells, white blood cells (lymphocytes), and platelets.

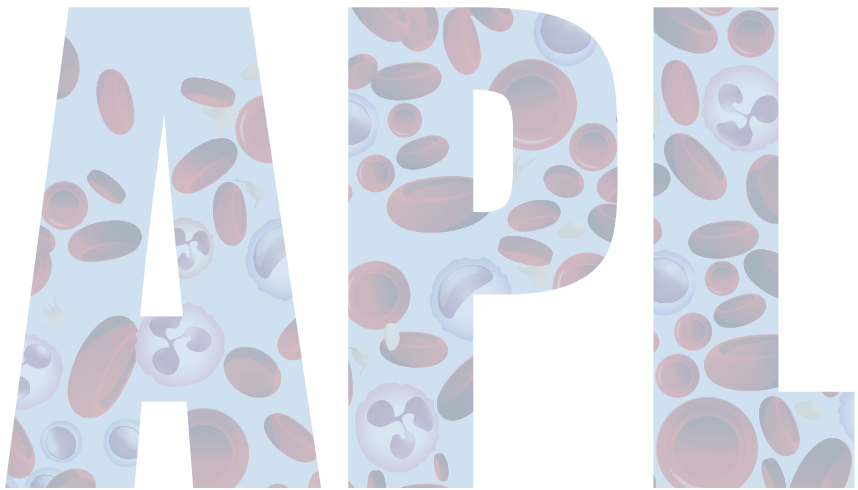
In APL, immature white blood cells called promyelocytes accumulate in the bone marrow. The overgrowth of promyelocytes leads to a shortage of normal white and red blood cells and platelets in the body, which causes many of the signs and symptoms of the condition.

Signs and symptoms of APL

What are the common signs and symptoms of APL?

People with APL are especially susceptible to developing bruises, small red dots under the skin, nosebleeds, bleeding from the gums, blood in the urine, or excessive menstrual bleeding. The abnormal bleeding and bruising occur in part because of the low number of platelets in the blood and also because the cancerous cells release substances that cause excessive bleeding.

The low number of red blood cells can cause people with APL to have pale skin or excessive fatigue. In addition, affected individuals may heal slowly from injuries or have frequent infections due to the loss of normal white blood cells that fight infection. Furthermore, the leukemic cells can spread to the bones and joints, which may cause pain in those areas. Other general signs and symptoms may occur as well, such as fever, loss of appetite, and weight loss.



What are the causes and risk factors for APL?

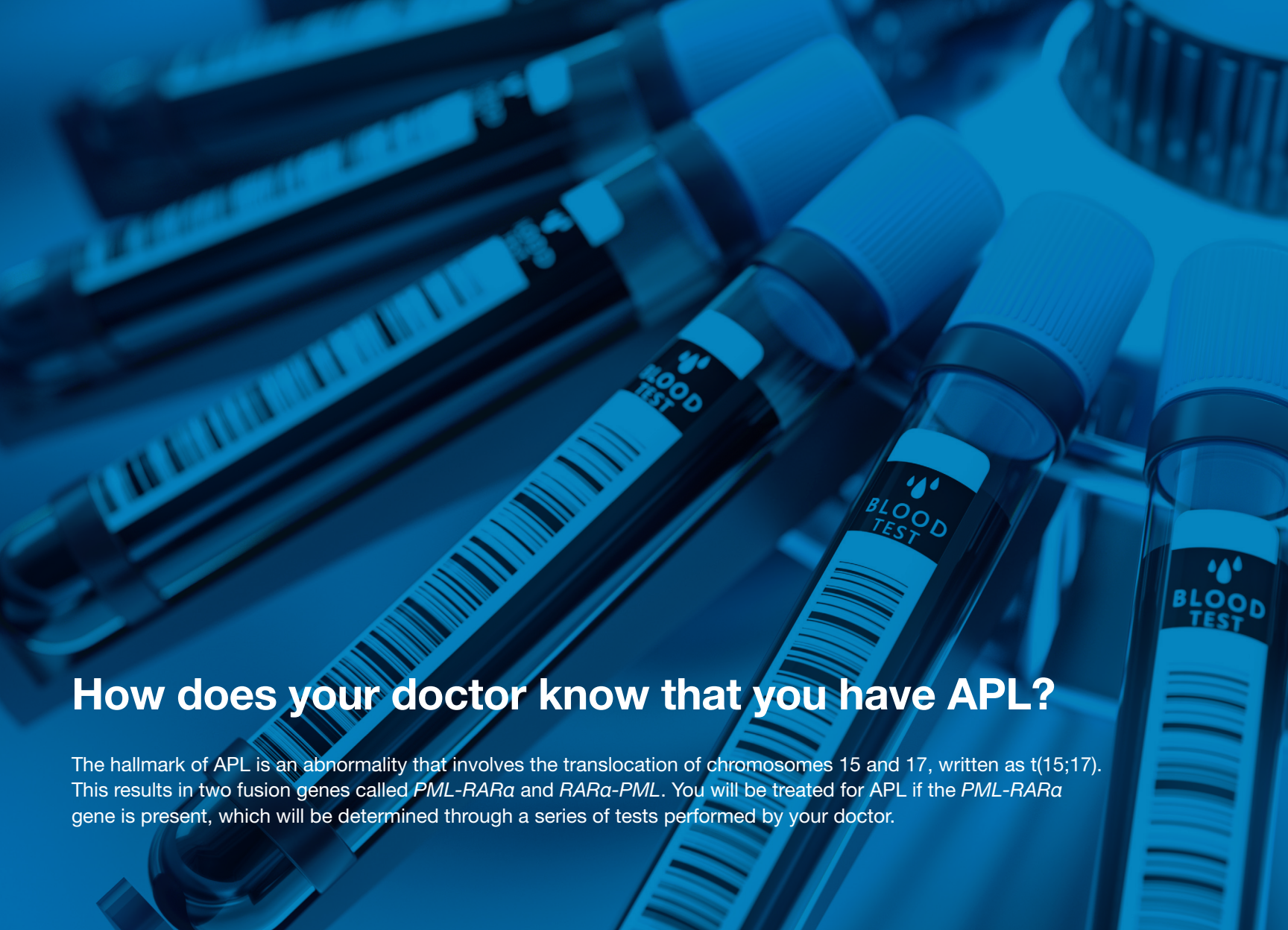
As a subtype of acute myelogenous leukemia (AML), APL is characterized by a genetic mutation only present in certain cells. This genetic change is acquired during a person's lifetime and is not inherited.

The cause of APL is very rarely known. APL can occur for no known reason, or at other times, can be caused by certain treatments for other forms of cancer. Treatment for APL is not based on what caused it.

The average age of diagnosis is 30, with the incidence rates of APL increasing until the age of 20 and remaining stable until the age of 60.

Questions to ask your healthcare provider about APL

- What is the status of my APL?
- How does the disease progress?
- How long does it take for the disease to progress?
- What is the outlook (prognosis) for my APL?



How does your doctor know that you have APL?

The hallmark of APL is an abnormality that involves the translocation of chromosomes 15 and 17, written as t(15;17). This results in two fusion genes called *PML-RARα* and *RARα-PML*. You will be treated for APL if the *PML-RARα* gene is present, which will be determined through a series of tests performed by your doctor.

What tests are done?

Blood tests

A peripheral blood smear will likely be done as testing. White blood cell and platelet counts are useful in assessing further risk stratification in your initial diagnosis of APL. Other presenting features of APL include hemorrhagic symptoms and occasional thrombosis, and as such, tests that measure how well and how long it takes your blood to clot may be required.

Bone marrow tests

A bone marrow aspiration and biopsy will likely be done to get bone marrow samples for testing. This procedure is performed with local anaesthesia, so you will remain awake, but your hip bone and the surrounding region will be “frozen” with an anaesthetic given by injection. This may cause stinging or burning. A small piece of marrow is sampled. This can cause a feeling of pressure or tugging.

Genetic tests

Additional testing, such as immunophenotyping and cytogenetic tests, will be performed on the blood or bone marrow samples to confirm the presence of the hallmark chromosomal translocation. Such tests include fluorescent *in situ* hybridization (FISH), molecular testing, and/or karyotyping to identify the pathogenic translocation or the resulting gene fusions.

Further tests may be conducted to provide information on your general health and to assess the extent of the cancer. These include tests such as electrocardiograms (ECGs) to assess the QTc interval and monitor your cardiac function. These results help your doctor plan your course of treatment and will be compared to later results to monitor you throughout your treatment.

Treatment phases

APL is aggressive and progresses quickly. Patients must start treatment quickly after being diagnosed. The goal of your treatment will be to reduce the number of blast cells until you achieve full remission, which is the absence of all signs and symptoms of cancer.

The treatment you receive for APL will depend on your health, your individual condition and your wishes. Treatment options include chemotherapy and drugs. Patients with relapsed or refractory APL can also use chemotherapy as well as non-chemo drugs, and may be offered a stem cell transplant.

Throughout your treatment, your medical team will always discuss treatment options with you. You'll be able to express your opinions and preferences and ask questions at any point.

Treatment is usually divided into 3 phases:

1. Induction (remission induction)
2. Consolidation (post-remission therapy)
3. Maintenance

Induction therapy (remission induction)

The first part of treatment, induction, reduces the number of leukemia cells to very low levels, which puts the APL into remission. Induction includes a combination of oral and intravenous drugs.

A bone marrow biopsy is usually done about one month after starting treatment, to see if the leukemia is in remission. Induction is typically continued until APL is in remission, which can take up to 2 months.

Consolidation (post-remission therapy)

When APL is in remission, consolidation therapy is used to maintain the status and to get rid of remaining leukemia cells. Which drugs are used depends on what was given for induction, as well as other factors. Patients typically get some of the same drugs used during induction, but the doses and timing of treatment might be different. Consolidation treatment typically lasts at least several months, depending on the drugs used.

Maintenance therapy

If there is a higher risk of relapse, consolidation therapy can be followed by maintenance therapy with lower doses of drugs over a longer period of time. Maintenance therapy is typically given for about a year.

Stem cell transplant

You might be offered a stem cell transplant, also known as a bone marrow transplant. This treatment replenishes your bone marrow with healthy stem cells, which then produce normal blood cells.

Treatment considerations

The goal of your induction treatment is to try to achieve remission by treating any leukemia cells still in the blood of bone marrow.

The next step, consolidation treatment, is aimed at trying to treat any leukemia cells that are still in the blood or bone marrow once remission is reached. It is done to maintain complete remission and prevent relapse.

What may occur in the induction phase?

A morphologic complete response is characterized by a large drop in the number of blasts. At this time of the induction phase, a cytogenetic complete response often occurs, too, meaning that the hallmark translocation of APL is absent. Once both responses are achieved, a molecular complete response may likely follow. This is defined as an absence of the *PML-RARα* gene. Often, more treatment is needed to achieve a molecular response. The absence of all signs and symptoms of cancer is called complete remission.

Questions to ask your healthcare provider about treatment options

- What is the status of my disease?
- What are my treatment options?
- Why are you recommending this option?
- What are the possible risks and benefits?
- What side effects may I have?
- Will I need to stay in the hospital?
- How will we know if the treatment is working?
- How will this affect my day-to-day life?

Common side effects

Side effects can happen with any type of treatment for APL, but everyone's experience is different. Some people have many side effects, while other people have few or none at all.

Follow-up care

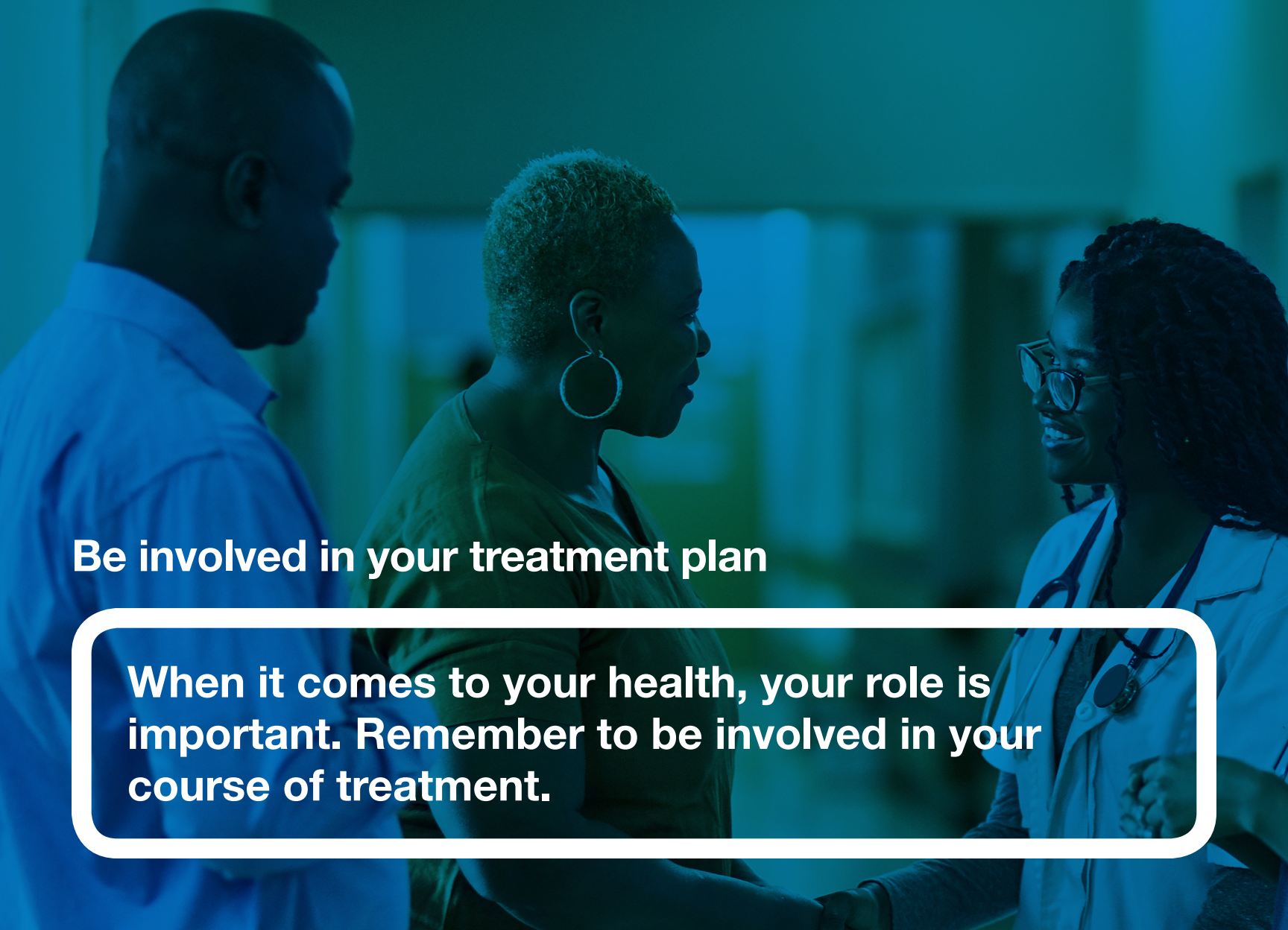
Follow-up care after treatment is an important part of cancer care. Follow-up for APL is often provided by the cancer specialists (oncologists or hematologists) and your family doctor. Your healthcare team will work with you to determine your specific needs for follow-up care.

Schedule for follow-up visits

Follow-up visits for APL are usually scheduled for many years after treatment even if there are no signs of the disease. The appointments will become less frequent, but you will need to see your doctor regularly, indefinitely.

Questions to ask your healthcare provider about side effects

- What are the possible side effects of my treatment?
- Are there ways to help prevent or manage certain side effects?
- Will I need to make special arrangements at home or with work if I experience side effects?
- When should I call you if I am having side effects?
- Who can I contact if I can't reach you?



Be involved in your treatment plan

When it comes to your health, your role is important. Remember to be involved in your course of treatment.

Your healthcare team

After your diagnosis of APL you will meet with your healthcare team. Your team will include a number of healthcare professionals, who will help you along the course of your treatment. Your team may include an oncologist, hematologist, pharmacist, nurse, social worker and a dietitian. Each member of the healthcare team will work to provide you with resources and support during your treatment. You will also receive supportive care coordinated by the members of your healthcare team.

Therapy programs

Complementary therapy programs are offered at many cancer centers and local hospitals, which have yoga, acupuncture and meditation programs.

Accepting help

You may be hesitant to accept help, but your family members and close friends really want to support you and provide assistance. You can remind them of the following:

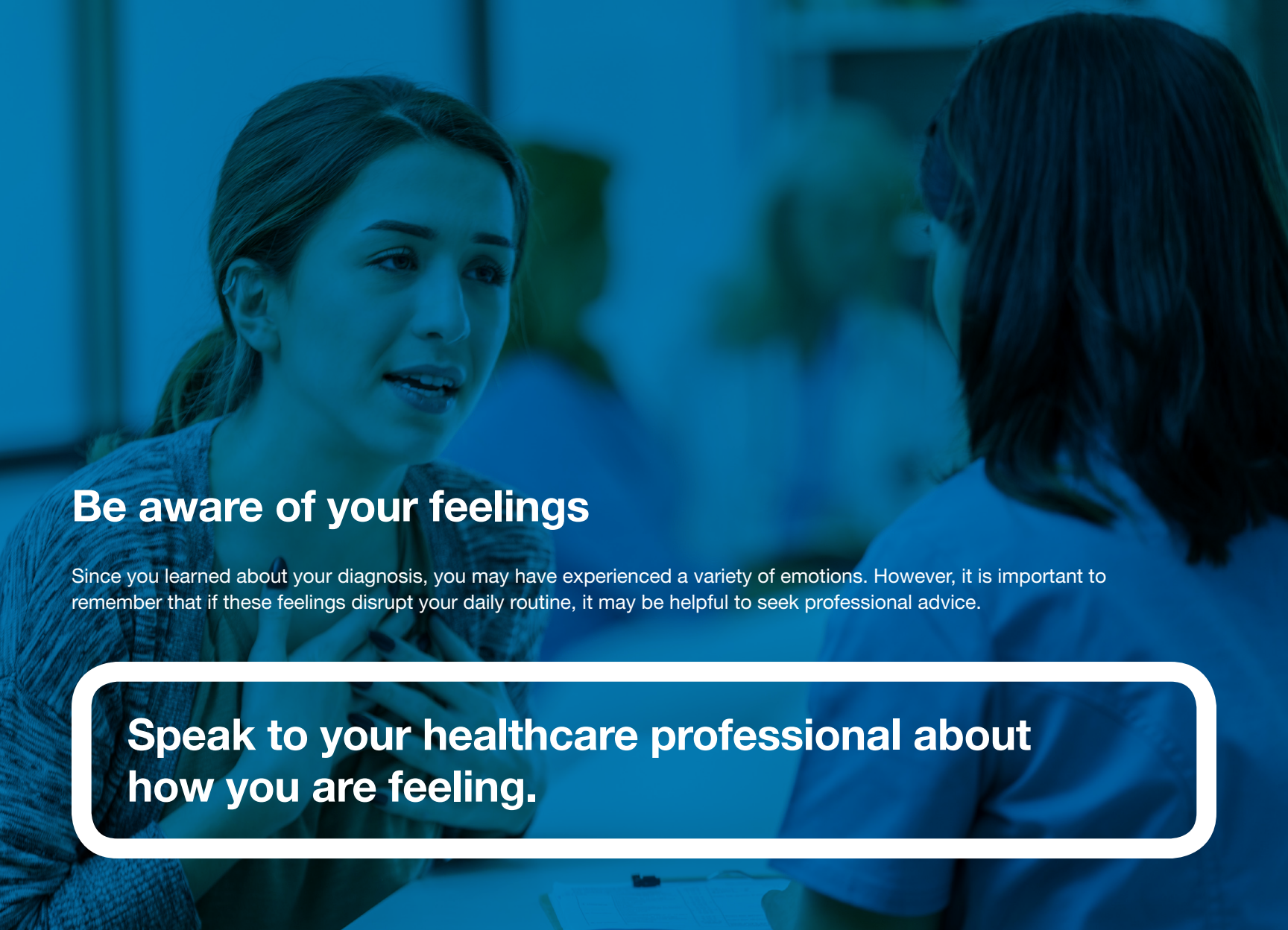
- They should act as usual when they are with you.
- They should listen to your complaints without immediately proposing a solution.
- They must not forget that you are still the person that they have always known.

You can also provide a more specific answer by listing your immediate and future needs, which might include the following:

- Taking care of your children or pets
- Grocery shopping or preparing meals
- Transporting you to and from your medical appointments

When a family member becomes ill, the usual roles and responsibilities of each member of the family can change.

- You may need your children to become more involved in taking care of daily chores.
- Your partner may have to manage the bills, run errands and do more of the tasks to maintain your home and property.
- Your partner may feel the need to find employment.



Be aware of your feelings

Since you learned about your diagnosis, you may have experienced a variety of emotions. However, it is important to remember that if these feelings disrupt your daily routine, it may be helpful to seek professional advice.

Speak to your healthcare professional about how you are feeling.

Share your feelings

Talking about your feelings can help you to accept them. Start by confiding in a close friend or family member. If this is not possible, you can seek help from professionals who know how to help you deal with the situation.

Join a support group

Although you may sometimes feel alone, remember that there are many others who are experiencing the same difficulties. Join a support group. This could be a very valuable experience, which might teach you how to manage your feelings. Some groups meet in person and others exchange information via the Internet. Some people speak openly and others prefer to listen. You will not be forced to do anything that makes you feel uncomfortable. Your healthcare team will certainly be able to guide you to a support group close to you.

Managing your finances

Take time off from work

Depending on your situation, you may have to take some time away from work. To determine how much sick leave you should ask for, meet with someone from your employer's human resources department or someone from your insurance company.

Ask for help managing your finances

During the different stages of your treatment, you may not have enough time or energy to manage your finances. Think of asking a family member or a close friend to take care of your bills, insurance forms, and other financial aspects to help you keep things organized. Knowing that your finances are being taken care of will eliminate one worry during this difficult time.

How to support someone living with APL

Here are a few things you can do to help take care of a loved one living with APL:

- Listen. One of the most valuable things you can do as a caregiver is listen to your loved one's needs and concerns.
- Stay organized. Helping your loved one schedule their doctor's visits and preparing a list of questions to ask during the appointment can all be useful ways of staying organized throughout this treatment journey.
- Help them with their daily needs. Whether that be preparing meals or running errands, taking on these simple tasks can provide great relief to your loved one.
- Educate yourself. Learning more about APL and the treatment options available may help you and your loved one understand the information available and clarify what you can do to help.

Take care of yourself

- Give yourself time to understand and work through your emotions. It may be helpful to share your feelings with other loved ones, join a support group, or speak with a mental health professional.
- Make time for yourself. Find nice things to do for yourself each day; even just a few minutes can help.
- Seek help from others. Reach out to your support group and find things they can do or arrange for you, such as appointments or errands.
- Find a quiet time for reflection each day. Remember the things you need to maintain a healthy mind, body, and spirit.

Notes

To assist you in keeping your healthcare team information in one place, write in their contact information in the area provided below.

Use this page to write down the name and contact numbers of the members of your healthcare team.

Name _____
Title _____
Phone _____
Address _____
_____
Email _____

Name _____
Title _____
Phone _____
Address _____
_____
Email _____

Name _____
Title _____
Phone _____
Address _____
_____
Email _____

Other important numbers

Nurse _____

Religious or spiritual advisor _____

Pharmacy _____

Hospital _____

Emergency contact _____

Glossary

Biopsy: The removal of cells or tissues for examination by a pathologist, a doctor specialised in the analysis of blood, body fluids and tissues. The pathologist can examine the samples with a microscope or perform tests on them. There are many types of biopsy procedures.

Blast cell: A young blood cell that can't function like a mature blood cell.

Bone marrow: The sponge-like tissue in the center of most bones.

Chromosome: The structure within cells that contain coded instructions for cell behavior (genes).

Clinical trial: A type of research that assesses health tests or treatments.

Cytogenetics: Study of the chromosomes using a microscope.

Deoxyribonucleic acid (DNA): A chain of chemicals in cells that contains coded instructions for making and controlling cells. Also called the "blueprint of life."

Fluorescent *in situ* hybridization (FISH): A lab test that uses special dyes to look for abnormal chromosomes and genes.

Hematologist: A doctor who has special training in diagnosing and treating blood disorders.

Immunophenotyping: A lab test that detects the type of cells present based on the cells' surface proteins.

Lymphocytes: A type of immune cell that is made in the bone marrow and is found in the blood and in lymph tissue. A lymphocyte is a type of white blood cell.

Mutation: An abnormal change in the instructions within cells for making and controlling cells.

Oncologist: A doctor who has special training in diagnosing and treating cancer. Some oncologists specialize in a particular type of cancer treatment.

Platelets: A type of blood cell that helps control bleeding.

Polymerase chain reaction (PCR): A lab process in which copies of a DNA part are made.

Promyelocytes: Immature white blood cells.

Refractory disease: Describes a disease or condition that does not respond to treatment.

Relapsed disease: The return or worsening of cancer after a period of improvement.

Remission: A decrease in or disappearance of signs and symptoms of cancer. In partial remission, some, but not all, signs and symptoms of cancer have disappeared. In complete remission, all signs and symptoms of cancer have disappeared, although cancer still may be in the body.

Stem cell: A cell from which blood cells and other cells develop.

Resources

National Comprehensive Cancer Network

A not-for-profit alliance of 28 leading cancer centers devoted to patient care, research, and education.

National Comprehensive Cancer Network
http://NCCN.org/patients

Health Canada's Clinical Trials Database

Health Canada's database about clinical trials provides Canadians with a list of precise information about ongoing clinical trials.

Health Canada's Clinical Trials Database
https://www.canada.ca/en/health-canada/services/drugs-health-products/drug-products/health-canada-clinical-trials-database.html

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