LIVING WITH PTLD

An information brochure for adults diagnosed with post-transplant lymphoproliferative disease (PTLD) following a solid organ transplantation (SOT) or an allogeneic hematopoietic cell transplantation (HCT), also called bone marrow or stem cell transplantation.

Disclaimer

The information in this leaflet provides helpful information about PTLD. Your family members and friends may also find it beneficial to read.

This material does not replace the advice of your healthcare professional. Be sure to ask your healthcare professional any questions or concerns you have.

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This leaflet has been created in collaboration with the Lymphoma Coalition – worldwide network of lymphoma patient organisations.

Being diagnosed with post-transplant lymphoproliferative disease (PTLD) can come unexpectedly. Understanding the facts surrounding the illness is very important for you to live your life in the best way during your care. Read on to find out more.

RECEIVING A PTLD DIAGNOSIS

You have been diagnosed with post-transplant lymphoproliferative disease (PTLD).

> Being diagnosed with PTLD after your long transplant journey is unexpected and can be overwhelming. Various emotions might come into play, such as fear, confusion, denial, feeling depressed, defeated, and possibly angry. It no doubt leaves you with more questions than answers – Why me? What is it about? and What will it mean for me?

Although PTLD is a rare and life-threatening complication of solid organ transplantation (SOT) and hematopoietic cell transplantation (HCT)[1], it is well known[2], and your health teams will quickly put a plan in place to treat your condition.
It is important to find ways to stay positive.

The symptoms and severity of PTLD vary from one person to another[3].
It can affect many aspects of your life, impacting your family and close relatives.

Increasing awareness and understanding about PTLD, and informing your relatives will help you and them to manage day-to-day, reduce stress, and enhance your daily life and related treatments.

WHAT DO I NEED TO KNOW ABOUT PTLD?

Post-transplant lymphoproliferative disease (PTLD) is the name for disorders ranging from a benign tissue overgrowth to a lymphoma that can sometimes develop in people who have had a transplant[1].

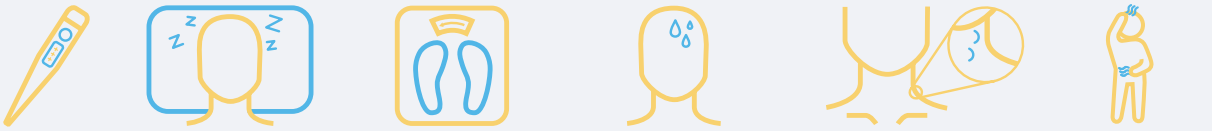
- **When you receive a transplant, doctors treat you with drugs to suppress the immune system.** They must suppress the immune system to help the body accept the transplant, avoid rejection and, in HCT patients, also prevent graft versus host disease. The downside is that it can leave patients at a greater risk of developing infections and, in some people, PTLD[2].

- **Sometimes, PTLD is associated with Epstein-Barr virus (EBV) infection.** EBV is a common herpes virus that does not usually cause problems in people with standard immune systems. In immunosuppressed post-transplant patients, however, EBV infection may remain uncontrolled and eventually lead to PTLD[3]. You will likely develop PTLD if you have not had an EBV infection before your transplant because donor tissues/cells could introduce it to your body for the first time[3]. On the other side, in case you had already been previously infected with EBV, PTLD could be the result of its reactivation due to immunesuppression.

- **PTLD can result in mild to severe complications[4].** On the mild side, some people develop a benign overgrowth of affected tissue, while others can develop a cancer called lymphoma[1]. Sometimes, PTLD does not respond (refractory) or returns (relapses) after treatment ends[5]. Increasingly, in the majority of cases, PTLD can be treated successfully, especially if diagnosed early[5], as existing treatment options can be very efficacious.

Symptoms of PTLD[5]

People with PTLD often have very general symptoms such as:



Fever | Fatigue | Unexpected weight loss over a few weeks | Night sweats | Painless lumps, e.g. swollen lymph nodes | A general feeling of poor health

The most common is a painless lump, usually in the neck, armpit, or groin. This is swollen lymph node (gland). You might have swollen lymph nodes deep within the body, where you can't feel them from the outside.

HOW CAN PTLD BE TREATED?

The treatment you need depends on your type of PTLD and how widespread it is. Because of the lack of specific symptoms, it may be challenging to detect and diagnose and establish a PTLD diagnosis.
Doctors rely on the following tools[5]:

- Your detailed medical history
- A biopsy of the lymph node or of the affected tissue (microscope studies and immunophenotyping to identify specific markers to help diagnose PTLD)

Other tests to confirm the diagnosis and assess the extent of the disease may include:

- Imaging tests: CT scan, PET scan or MRI
- Blood tests
- Lumbar puncture or bone marrow biopsy

Who provides my treatment plan?
Your treatment plan will be created by a multidisciplinary team (MDT) composed of:

- Transplant physicians
- Haemato-oncologists
- Other specialists

They consider your general health status, your PTLD types and stage, the degree of immunosuppression, and the types of therapy available.

Ask your medical team if you have questions about your PTLD treatment plan.

What kind of treatment is available for PTLD?

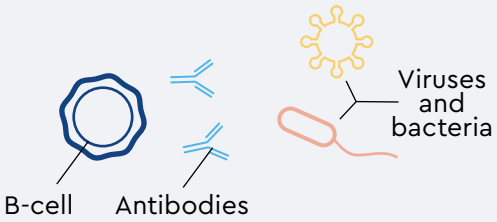
The following treatment options are available[6,7]	
Reducing your immunosuppressive drugs	When possible one of the most common first steps in treating PTLD is to start reducing your immunosuppressive treatment to the lowest possible dose.
Antibody therapy	Antibodies are used to help your immune system recognize and fight a condition, e.g., cancer or severe infection.
Chemotherapy	The chemotherapy treatment you need depends on your type of PTLD. If you have B-cell lymphoma, chemotherapy is often given with antibody therapy, which is called chemo-immunotherapy.
Surgery or radiotherapy	These treatments are not usually used for PTLD but can be used to control or reduce symptoms.
EBV-specific T-cell therapy	EBV-specific T-cell treatment treats people with EBV-positive PTLD. It targets and kills cells infected by EBV.
Clinical trials	Clinical trials are necessary for developing new medicines and, in many cases, can be an important treatment option for patients.

Visit https://clinicaltrials.gov/ for more information on clinical trials being conducted around the world.

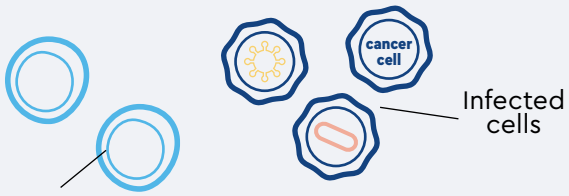
What are B-cells and T-cells[4]?

B-cells and T-cells are white cells of the immune system made in the bone marrow. Both are critical to the body's defense against disease and infection but play very different roles.

Normal working B-cell



Normal T-cells

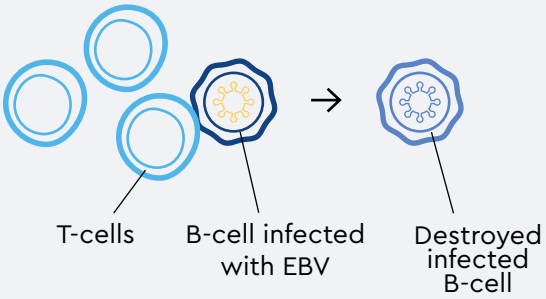


T-cells can recognize infected cells and help protect the body from invaders (viruses, bacteria or cancer cells)

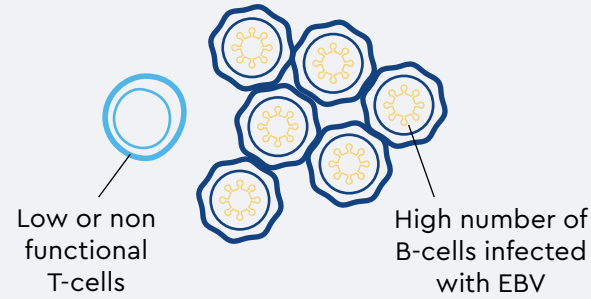
B-cells produce antibodies to help your body neutralize invaders. In the case of PTLD, the B-cells grow and spread out of control while T-cells are low or not functional in the body due to the effects of immunosuppressant medicines used in transplantation.

On EBV⁺ PTLD

Normal working T-cell



Under immunosuppressant medicines



In case of EBV⁺ PTLD B cells are infected with EBV, T-cells help wipe out the infected B-cells or cancerous cells. They recognize the infected B-cells and release cytotoxins (a toxic agent), causing the infected cells to burst, destroying the virus inside them.

HOW CAN I BEST MANAGE PTLD?

Receiving a diagnosis of PTLD is a profoundly personal experience. There is so much to process, intellectually and emotionally, it can leave you scared and anxious. Communication is key.

Whom should I tell about my PTLD?
Patients report that it is beneficial to inform family and close friends, as they are the ones who will provide emotional and practical support throughout your illness. Tell your extended network when you feel ready to do so.

How should I tell them?
You can speak to people individually, talk to a person/group with the support of a healthcare professional or ask someone else to tell people.

It is worth remembering that people will want to support you but can only help if they know what you're facing. The sooner you build your support networks, the sooner you can have those essential conversations.

What about my healthcare team?
Communicate regularly with your healthcare team to get the necessary answers and clear doubts. This will reassure you, make you more optimistic and engender trust between you. Expressing your goals, needs, and preferences to your healthcare care team will help them make the best choices, considering your specific needs.

What will help me manage my condition?
Your treatment period can be lengthy, so patience is needed. Patience helps you calmly deal with stress without giving up and understand that treatment will take time. It will help you adapt, learn to deal with difficult situations healthily, and help you to progress. Do not try to force progress. Take it slowly. There is only one objective to focus on:

getting better, one day at a time.

WHAT CAN I DO TO INCREASE MY WELL-BEING?

It is important to know that you are not powerless – there are ways to cope with emotional distress and preserve your quality of life. **Tips to help you cope:**

Give yourself time to absorb the news – anger, denial, fear, and anxiety are all normal reactions to bad news.

Create a support network – ask for emotional and practical support from your family members/ caregivers to keep you going.

Educate yourself about your condition – understanding as much as you can about your illness and treatment options allows you to have a two-way conversation with your healthcare team.

Set yourself goals – look ahead day by day, or perhaps you take a longer view.

Be patient with the pace of treatment and recovery – eat a healthy diet, exercise, sleep well and pursue those relationships and activities that bring you joy.

Take a deep breath and look ahead – your life may not be what you once thought it would be, but you can find a balance.

Find out what gives you positive energy – try to avoid people or things that can negatively influence you.

WHAT SUPPORT DO I NEED?

For you to be able to manage your PTLD, you will need help and support. **Caregivers play a critical role** in taking on important tasks and functions such as:

Advocate: Acting as a go-between between you and your care team when you cannot speak for yourself.

Support during your hospitalization or once you are at home: The main activities of family caregivers in the hospital are accompanying, entertainment, emotional support and brokerage. Once you are at thome you can support helping with your daily activities.

Emotional Support: Caregivers provide much-needed support and encouragement and help you to retain a positive attitude.

Medical Care: Caregivers must be present, take notes, ask questions and assist you in making decisions with your healthcare team. They may also be responsible for providing transportation to appointments, dealing with scheduling, and assisting with other medical processes such as physical therapy, injections, feeding tubes, etc.

THE CAREGIVER'S ROLE

Share the following section with the person you have chosen to be a caregiver.

The caregiver role
If you are a caregiver, you will play an essential role in the health care and recovery of the patient. We recommend you read this leaflet as it might help answer questions you have – you can also ask the healthcare team during consultations.

What does your role involve?
A caregiver can play many roles simultaneously, including being a friend, confidant, nurse, and assistant – helping the patient remain positive. You will be called to gather information, talk to doctors, be involved, and provide support. You will likely work with the healthcare team and must follow precise instructions.

One of your most important tasks is to immediately watch for new symptoms or problems and report them to the healthcare team. That's because waiting to report symptoms could cause serious complications.

You may also need to:

- Assist patient while hospitalized
- Take the patient to appointments at the hospital or clinic – sometimes on short notice
- Protect them from infections once at home by maintaining a clean environment
- Follow the rules about what is safe to eat.

Your well-being
It is important to remember that although you may be providing solutions to the patient, you need support in your own right to help you stay physically and emotionally well and maintain your own life. Pay attention to yourself, have your own space and take time to recover and rest.

WHAT OTHER SUPPORT IS AVAILABLE TO ME?

In addition to support from family and friends, connecting with other PTLD patients through a patient support group can be extremely valuable. Sharing experiences and feelings with people who know what it is like to live with PTLD can be comforting and empowering.

You could contact several organizations and patient support groups following a PTLD diagnosis for more support and advice.

The following is a list of European and International Patient Support Groups:

Lymphoma Coalition
ww.lymphomacoalition.org

NOTES

To discuss with my caregiver/partner:

To discuss with my treating physicians:

To discuss with the nurse:

Questions for my next appointment:

If any adverse event encountered, call Doctor on:

GLOSSARY OF MEDICAL TERMS

Allogeneic: An allogeneic stem cell transplant uses healthy blood stem cells from a donor to replace the unhealthy or non-functional bone marrow of the recipient. An allogeneic stem cell transplant is also called an allogeneic bone marrow transplant.

Antibody: Antibodies are disease-fighting proteins in the body that play a crucial role in the immune system.

B-cells: A type of white blood cell that makes antibodies. B-cells are part of the immune system and develop from stem cells in the bone marrow.

B-cell lymphoma: A type of cancer originating from B-cells. B-cell lymphomas may be either indolent (slow-growing) or aggressive (fast-growing). Most B-cell lymphomas are non-Hodgkin lymphomas. There are many different types of non-Hodgkin B-cell lymphomas.

Biopsy: A biopsy is a medical procedure that involves taking a small sample of body tissue so it can be examined under a microscope.

Bone marrow: A soft, spongy area in the center of some of the body's larger bones. It produces all the different cells that make up the blood, such as red blood cells, white blood cells (of many different types), and platelets. All of the cells of the immune system are also made in the bone marrow.

Chemo-immunotherapy: Chemotherapy combined with immunotherapy. Chemotherapy uses different drugs to kill or slow the growth of cancer cells; immunotherapy uses treatments to stimulate or restore the ability of the immune system to fight cancer.

CT scan: Computed tomography is commonly referred to as a CT scan. A CT scan is imaging procedure that uses a combination of X-rays and computer technology to produce images of the inside of the body.

Cytotoxins: A cytotoxin is any substance that has a toxic effect on an essential cellular function.

Epstein-Barr virus (EBV): EBV is a common virus that infects > 95% of adults worldwide and causes lifelong infection. EBV can cause infectious mononucleosis, but infection is asymptomatic (no symptoms) in most people. EBV is an oncogenic virus meaning that it is associated with certain cancers, including Burkitt lymphoma, immunoblastic lymphoma, nasopharyngeal cancer, and stomach (gastric) cancer.

EBV⁺ PTLD: Post-transplant lymphoproliferative disease (PTLD) is a life-threatening complication of solid organ transplantation (SOT) and hematopoietic cell transplantation (HCT). In most cases, PTLD is associated with active replication of Epstein-Barr virus (EBV) after either primary infection or reactivation during treatment with immunosuppressive drugs.

Graft versus host disease (GvHD): GvHD means the graft reacts against the healthy cells of the host in HCT patients. The graft is the marrow or stem cells from the donor. The host is the person having the transplant. GvHD happens when T-cells in the donated stem cells or bone marrow attack your own body cells.

Haemato-oncologist: A hematologist-oncologist is a physician who specializes in diagnosing, treating, and/or preventing blood diseases and cancers.

HCT: Hematopoietic cell transplantation (also called bone marrow transplantation or stem cell transplantation) is a type of treatment for cancer (and a few other conditions as well).

Immunophenotyping: This process is used to help and characterize diseases, such as specific types of leukemia and lymphoma.

Lymph nodes: Lymph nodes are small, oval-shaped organs that contain immune cells to attack and kill foreign invaders, such as virus.

Lymphoma: Lymphoma is a broad term for cancer that begins in cells of the lymph system.

MRI: Magnetic resonance imaging (MRI) is a type of scan that uses strong magnetic fields and radio waves to produce detailed images of the inside of the body.

PET scan: A positron emission tomography (PET) scan is an imaging test that can help reveal your tissues and organs' metabolic or biochemical function. The PET scan uses a radioactive drug (tracer) to show both normal and abnormal metabolic activity.

PTLD: A condition in which lymphocytes (usually B-cells) grow out of control after transplantation in patients with weakened immune systems. This usually happens if the patient has also been infected with the Epstein-Barr virus. Also called a post-transplant lymphoproliferative disorder.

Radiologists: Radiologists are medical doctors that specialize in diagnosing and treating injuries and diseases using medical imaging (radiology) procedures (exams/tests) such as X-rays, computed tomography (CT), magnetic resonance imaging (MRI), nuclear medicine, positron emission tomography (PET) and ultrasound.

SOT: Solid organ transplantation is a treatment option for end-stage organ failure of the kidneys, liver, pancreas, heart, and lungs. Transplantation involves the removal of an organ from a donor to place it in the recipient's body. The new organ replaces a damaged one.

T-cells: A type of white blood cell. T-cells are part of the immune system and develop from stem cells in the bone marrow. They help protect the body from invaders (viruses, cancer cells).

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