LGD Alliance Europe
for Complex Lymphatic Anomalies

LGDA

Understanding
Isolated Lymphatic Malformations

A Guide for Patients and Families

Understanding Lymphatic Malformations

The lymphatic system is an important part of the body's circulation and immune defense. When parts of this system don't form or function normally, it can lead to a group of rare conditions known as lymphatic malformations (LMs).

This guide focuses on isolated lymphatic malformations (LMs)—those limited to one area of the body, such as the neck, cheek, arm, or leg. These malformations can look and behave differently from person to person.

There are other lymphatic malformations that are related but distinct from isolated LMs:

- Complex Lymphatic Anomalies (CLAs) affect multiple organ systems, including lung spleen, soft tissue, or bones.
- Lymphedema causes swelling (edema) when lymph fluid cannot drain properly through the lymphatic system.

If you or your child has one of these conditions, you may find these resources helpful:

- For CLAs, see the Patient & Family Guide to Complex Lymphatic Anomalies.
- For lymphedema, visit the National Lymphedema Network (NLN) for detailed resources, support, and care information.

In this guide, we'll explore what isolated lymphatic malformations are, how they are diagnosed, and what treatments and supports are available.

What is the lymphatic system?

The lymphatic system is a network of tubes or vessels that drain lymph fluid from all over the body and return or deposit that fluid back into major veins in the chest.

Peripheral lymphatic vessels, in the extremities, are small and become larger as they move closer to the heart. Lymphatic vessels have specialized cells (lymphatic endothelial cells) and valves to keep the lymph moving toward the heart.

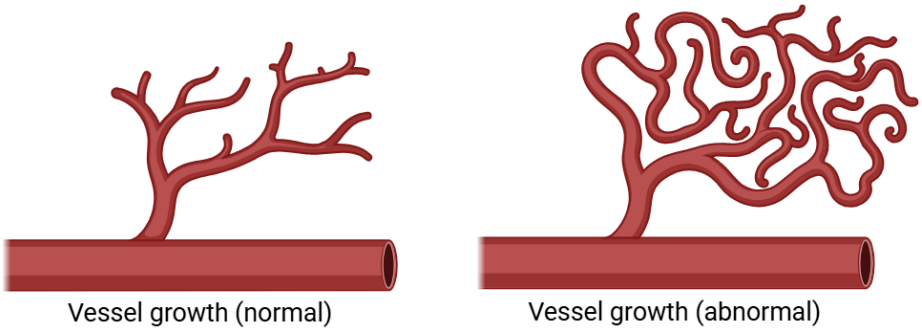
The main purpose or role of the lymphatic system is:

- Maintain fluid levels in your body
- Absorb fats from the digestive tract
- Help fight infections

Important parts that make up the lymphatic system are:

- Lymph: clear fluid containing white blood cells that helps clear toxins and waste
- Lymphatic vessels: small tubes (vessels) that carry lymph throughout the body
- Lymphatic endothelial cells: specialized cells that line the lymphatic vessels to maintain structure, and valves to keep the lymph moving in one direction

A helpful video, on YouTube, describes the lymphatic system.



Abnormal development of lymphatic vessels

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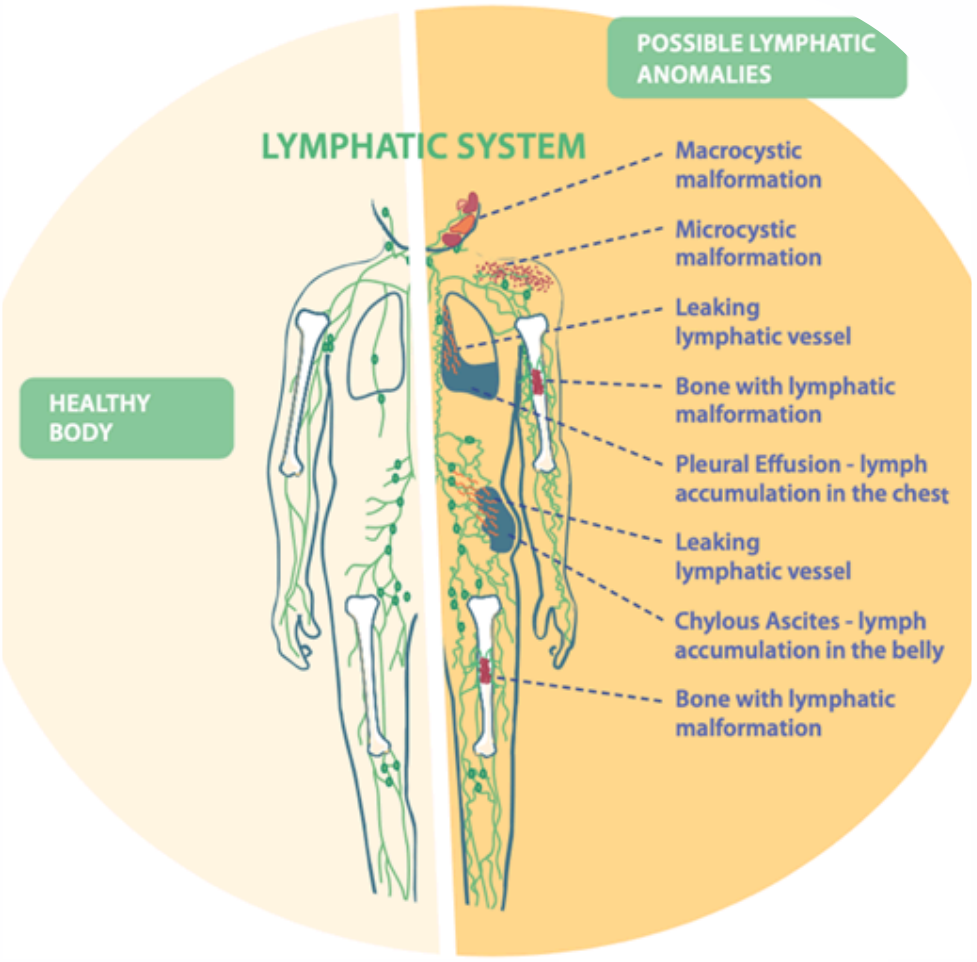
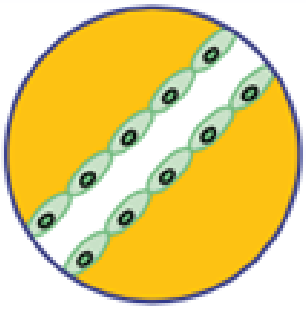
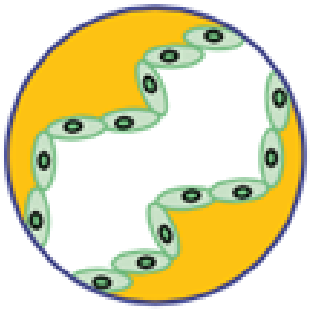




Normal lymphatic vessel



Lymphatic malformation

Lymphatic malformations are caused by abnormal growth of lymphatic vessels

How are Genetics Involved Isolated LMs?

Isolated lymphatic malformations (LMs) are caused by changes in genes called pathogenic variants (also known as mutations).

“Genes” are small pieces of DNA that instruct your body to work and develop. “Pathogenic” just means a change in a gene that can cause a disease, so a “pathogenic variant” is a change in a gene that can cause LMs to grow. However, not all patients with an LM will have an identified gene variant.

Pathogenic variants can be somatic (mosaic) or germline (inherited). Understanding the difference helps explain why most isolated LMs occur by chance and are not passed from parent to child.

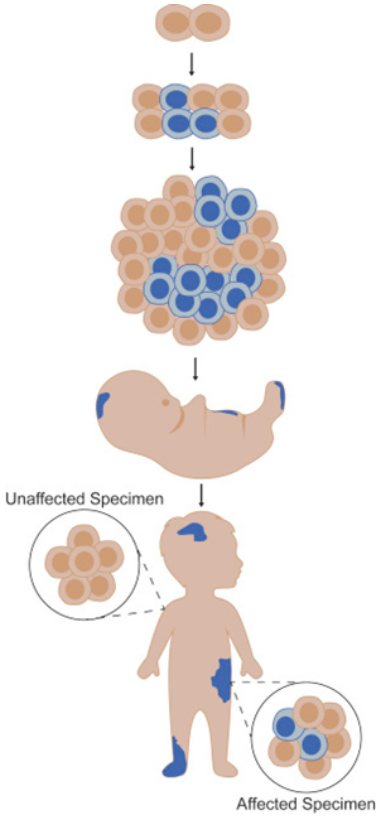
Somatic (Mosaic) Variant or Mutation

A change in DNA that occurs after conception, when the baby is developing in the womb. These variants occur in some—but not all—cells of the body. This mixture of normal and altered cells is called mosaicism. Somatic variants can happen in any tissue of the body except the reproductive cells (sperm or egg) and therefore are not passed on to children.

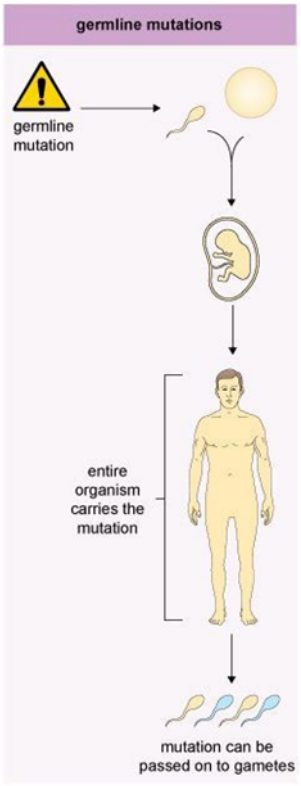
In isolated LMs, the most common somatic variant occurs in the PIK3CA gene, which controls cell growth and metabolism. Less commonly, variants are found in BRAF.

Germline (Inherited) Variant or Mutation

A gene change in the DNA of a reproductive cell (egg or sperm) that becomes part of every cell in the body of the child. These variants can be inherited from a parent and passed down to future generations.



Acquired somatic variant



Germline mutation

What are the Different Types of Isolated LMs?

Isolated lymphatic malformations (LMs) can vary in size, depth, and appearance depending on how and where they form in the body. There are three main types based on the size and structure of the lymph-filled cysts that develop.

Macrocystic Lymphatic Malformation

Macrocystic LMs are made up of large fluid-filled cysts, which may feel like soft, compressible lumps under the skin. Think of them as “water balloons” filled with lymphatic fluid.

These cysts are often well-defined and can change in size, sometimes swelling due to infection, inflammation, or fluid buildup. They’re most often found in the neck and underarm (axilla) areas but can also occur in any part of the body.

Macrocystic LMs are more common in babies born with chromosomal disorders, like Down syndrome, Noonan syndrome or Turner syndrome (Sleutjes, 2022).

Microcystic Lymphatic Malformation

Microcystic LMs consist of many tiny cysts, often too small to see individually, and often involve the skin or mucosal surfaces. They may resemble a cluster of small bubbles or a sponge-like structure. Blister-like lesions can appear on the mouth, tongue, face, or limbs and can cause swelling and pain, bleeding and can leak clear lymph fluid.

Mixed (Macro-Microcystic) Lymphatic Malformation

Mixed LMs contain both large and small cysts in the same area. This combination can cause both visible swelling and deeper, less-defined tissue involvement. Mixed lesions can appear in almost any area of the body, including the neck, arms, legs, trunk, or chest wall.

The following chart outlines each isolated LM along with its old terminology, distinguishing features, and genetic correlation.

	Macrocystic	**Microcystic**	**Mixed (Macro-Microcystic)**
Previous terminology (no longer being used)	Cystic hygroma, lymphangiomas	Lymphangioma circumscriptum, Capillary lymphangioma	Cavernous lymphangioma, Lymphangioma (unspecified)
Distinguishing features	large fluid-filled cysts or lumps under the skin	tiny cysts that appear as cluster of small bubbles/ sponge-like structure	both visible swelling and deeper, less-defined tissue involvement
Genetics, pathogenic, gene variants	Somatic: *PIK3CA* mostly; occasionally *BRAF*	Somatic: *PIK3CA*	Somatic: *PIK3CA*

What are the Symptoms of Isolated LMs?

The most common symptoms of isolated LMs are listed below. Symptoms can appear at any point in life, but they usually show up during childhood.

- Soft, painless swelling or lump under the skin
- Enlargement of the affected area over time
- Sudden increase in size due to infection, trauma, or hormonal changes (such as puberty or pregnancy)
- Discomfort, pain, or pressure in the area involved
- Leakage of clear or blood-tinged lymph fluid through the skin
- Inflammation or infection of the affected tissue

Symptoms can also vary based on the area of the body that is affected and can lead to unique and specific conditions.

Soft tissue:

- In the head and neck, swelling may press on the airway or esophagus, making breathing or swallowing difficult.
- In the mouth or tongue, an LM can interfere with speech or eating.
- Around the eye, an LM can affect vision.

Skin:

- Skin LMs can be clear, bluish, or red. They can leak lymph fluid and bleed easily.
- LMs on the skin can change color and become warm, or tender if inflamed or infected. Doctors call these events “flares”.

Internal:

- LMs that occur deeper and might not be visible on the surface.
- LMs can involve the abdomen causing swelling and pain.
- Rarely, internal LMs can cause fluid collections around the heart, lungs, or abdomen. These fluid collections are called “effusions”, and they can lead to discomfort or other complications.

How are Isolated LMs Diagnosed?

Imaging Tests

- Ultrasound can help distinguish fluid-filled cysts from other types of lumps or masses. LMs can sometimes be seen even before birth on a prenatal ultrasound.
- Magnetic Resonance Imaging (MRI) can determine the LM size, the types of cysts, and if it involves or presses on nearby organs, muscles, or nerves.
- MR Lymphangiogram or Conventional Lymphangiography are specialized imaging tests that visualize the lymphatic vessels and the flow of lymphatic fluid. These are not often needed for isolated LMs.

Genetics

There is no blood test that can diagnose LMs. The only way to discover the gene change causing the LM is to test the abnormal lymphatic tissue or fluid. This requires a biopsy of the abnormal LM tissue. Since most isolated LMs are caused by the PIK3CA gene mutation, genetic testing is not always performed.

Physical Exam

Depending on where the LM is located, your doctor may look for:

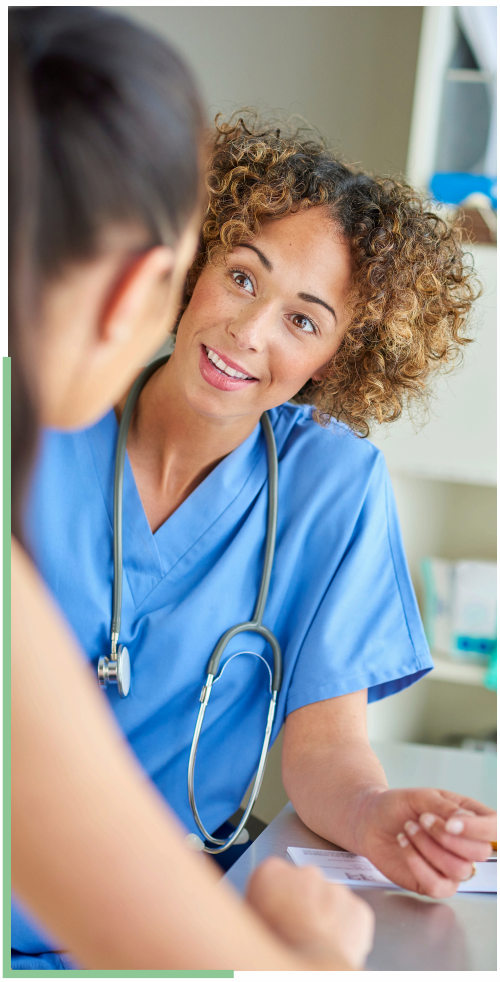
- Airway obstruction or feeding difficulties.
- Soft tissue enlargement, deformity, or asymmetry of the affected area.
- Proptosis (the eye pushed forward), double vision (diplopia), strabismus, or even vision loss from increased pressure.
- Abdominal pain or distension
- Clusters of blisters on the skin, tongue or mouth, which can ooze clear or blood-tinged fluid.

How are Isolated LMs Treated?

There is currently ***no cure*** for isolated LMs. Treatment focuses on managing symptoms, reducing swelling, and improving quality of life. A treatment plan may also be based on the size, type, and location. Options include: (The Leeds Teaching Hospitals, 2025):

Observation ("Watch and Wait")

Regular checkups and imaging may be recommended. Treatment can begin if the LM grows or causes new issues such as pain, infection, or functional problems.



Sclerotherapy

This procedure includes a fine needle going into the cyst, draining the fluid, and then injecting a medication that irritates the LM (called a sclerosant). This irritation causes the LM to shrink or close off.

LMs can require several sessions, and sclerotherapy is the most effective for macrocystic LMs. The goal of sclerotherapy is to improve symptoms caused by the LM. Sclerotherapy will not make the LMs disappear, and they can regrow over time.

Medications

- Sirolimus (oral or topical) helps reduce lymphatic vessel growth and inflammation. Topical sirolimus cream can also help skin-based lesions that leak or bleed easily.
- Alpelisib approved for some PIK3CA-related overgrowth spectrum (PROS) conditions.
- Clinical trials might also be available at your center to test if new medications can shrink LMs and decrease their size.

Surgery (debulking surgery)

Surgery, also referred to as debulking, can be considered if the LM is localized and accessible. Complete removal is often difficult and may lead to recurrence of the LM. Doctors usually recommend surgery when other treatments have not been effective or when the LM causes serious functional problems.

Other treatments that may be beneficial include:

- Compression garments—such as sleeves, stockings, or bandages
- Lymphatic Drainage Massage
- Laser therapy or radiofrequency ablation for small or surface-level LMs

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When an LM is detected on an unborn fetus, a multidisciplinary team, which may include specialists in maternal-fetal medicine (MFM), fetal surgery, neonatology, and lymphatic malformations, will work together to guide monitoring and treatment during pregnancy. This team approach helps ensure the safest possible outcome for both the baby and the parent.

How Does Isolated LMs Affect Daily Life?

Isolated lymphatic malformations (LMs) are ***benign (non-cancerous)*** growths. With proper care, most people with LMs lead active, fulfilling lives.

Health and Daily Care

Keeping the affected area clean and protected helps prevent irritation or infection, especially if the LM involves the skin or leaks fluid.

Follow your care team's guidance for:

- Gentle cleansing and moisturizing
- Avoiding tight clothing or friction over the area
- Watching for redness, pain, or drainage that could signal infection

Growth and Changes Over Time

A LM usually grows slowly and proportionally with the child. It may occasionally change in size or appearance—even in adults—often due to infection, trauma, or hormonal changes.

Contact your doctor if you notice:

- Rapid swelling, redness, or pain
- Sudden growth during puberty or pregnancy
- Swelling after injury or trauma

Daily Activities

Most children and adults with LMs can join in normal physical activities.

- Swimming, walking, and non-contact sports are encouraged.
- If the LM is on the face, neck, or airway, develop an emergency plan with your care team, teachers, coaches, and school.

Appearance and Confidence

Visible LMs—especially on the face or neck—can sometimes affect self-esteem. Encouragement, open communication, and support can help build confidence. Connecting with other families or support groups reminds them they're not alone—and that many people live healthy, confident lives with LMs.

Resources

Medical Centers

A list of global vascular centers that may be specialized in treatment of isolated LMs can be found on our website at lgdalliance.org.

Patient Support

For a list of patient resources, including our patient registry and support groups, please visit our website at lgdalliance.org

Contact

info@lgdalliance.org

References

- Sleutjes, J. K. (2022). Lymphatic Abnormalities in Noonan Syndrome Spectrum Disorders: A Systematic Review. Mol Syndromol, 1-11.
- The Leeds Teaching Hospitals, N. T. (2025, 11 11). Lymphatic malformations and their treatment (Teenager). Retrieved on December 11, 2025 from The Leeds Teaching Hospitals.

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Supporting patients and families living with isolated LMs.

www.lgdalliance.org

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