CONDITION

Port-wine stain

A port-wine stain is a lifelong birthmark caused by unusually formed small blood vessels in the skin.

WHAT IT IS
A lifelong capillary birthmark caused by malformed small blood vessels

BODY SYSTEM
Skin and small blood vessels

MAIN SYMPTOMS
Flat pink-to-purple patch, darkening, thickening, skin nodules

WHAT CAUSES IT
Somatic gene change before birth

HOW IT IS DIAGNOSED
Skin examination; eye tests or imaging when indicated

MAIN TREATMENT
Vascular laser therapy and cosmetic camouflage

CAN IT BE CURED?
No - treatment can lighten but rarely removes it completely

IS IT AN EMERGENCY?
Sometimes - seizures, sudden vision changes, or uncontrolled bleeding

LONG-TERM OUTLOOK
Usually lifelong; may darken and thicken over time

Overview

A port-wine stain is a type of birthmark caused by unusually formed capillaries, the smallest blood vessels in the skin. The medical term is a capillary malformation .

The mark is usually present at birth. It may start as a flat, pale pink or red patch. Unlike some other birthmarks, it does not normally disappear as a child grows. It usually grows in proportion with the body and may gradually become darker, thicker, or more uneven.

Port-wine stains can occur anywhere. They are often found on the face, neck, arms, or legs. Most affect the skin only and do not cause physical health problems.

Location matters. A port-wine stain on the forehead or around an eye may sometimes be linked with changes in the eye or blood vessels around the brain. A large stain on a limb may

occasionally be associated with abnormal growth or other blood vessel malformations. These findings need assessment, but they do not mean that an associated condition is definitely present.

Port-wine stains are not bruises, infections, or cancer. They cannot spread to other people.

Symptoms

The main feature is a clearly defined patch of discoloured skin. Its colour can look different depending on skin tone, depth of the blood vessels, age, and temperature.

A port-wine stain may:

The affected skin usually has normal sensation. It may temporarily look darker during exercise, crying, hot weather, or cold weather because these conditions change blood flow.

Over the years, some stains develop raised areas or small lumps called nodules. The surface may bleed after being scratched or knocked. A rapidly growing or repeatedly bleeding lump should be examined because it may need treatment.

A port-wine stain is different from an infantile haemangioma. A haemangioma often appears during the first weeks of life, grows for a time, and then gradually shrinks. A port-wine stain is present from birth, does not go through this growth-and-shrinkage pattern, and remains unless treated.

Symptoms outside the skin may suggest an associated condition. These can include seizures, weakness on one side, developmental difficulties, eye pain, reduced vision, or enlargement of an affected arm or leg.

- Be pink, red, reddish-brown, or purple
- Affect one side of the face or body
- Feel flat and smooth during childhood
- Become darker, thicker, or more uneven with age

Causes and risk factors

A port-wine stain develops when some small blood vessels in the skin form differently before birth. The vessels remain more open than usual, allowing blood to show through the skin.

Many port-wine stains are linked to a somatic genetic change . This is a change that occurs in a group of cells during early development. It is not usually present throughout the body and is

generally not inherited from either parent.

Nothing someone does during pregnancy is known to cause a port-wine stain. Food, exercise, minor illness, and everyday medicines are not established causes.

Certain locations are linked with a greater chance of associated problems. A stain involving the forehead, upper eyelid, or a large part of one side of the face can be associated with Sturge-Weber syndrome . This condition may affect blood vessels around the brain and eye.

A port-wine stain on a limb, especially when accompanied by overgrowth, prominent veins, or swelling, may be part of a combined blood vessel condition such as Klippel-Trenaunay syndrome. Most port-wine stains are not part of either syndrome.

Diagnosis

A healthcare professional can usually diagnose a port-wine stain by examining the skin and asking when the mark first appeared. A biopsy, which removes a skin sample, is rarely needed.

The examination considers the stain's colour, shape, location, and whether the skin is flat or raised. It also helps distinguish a capillary malformation from a haemangioma, bruise, or another type of blood vessel birthmark.

Further assessment is based on the location and other symptoms. It is not required for every port-wine stain.

A baby or child with a stain around the forehead or eyelid may need an eye examination. This can include measuring pressure inside the eye to look for glaucoma. Glaucoma damages the nerve connecting the eye to the brain and can affect vision if it is not treated.

If Sturge-Weber syndrome is suspected, a specialist may recommend brain imaging, usually magnetic resonance imaging, or MRI. MRI uses a strong magnet to produce detailed pictures. The timing and interpretation of imaging in babies require specialist judgment because early scans may not always show every change.

A stain on an enlarged or swollen limb may be assessed with ultrasound or MRI to examine deeper blood vessels and surrounding tissues.

Treatment and management

Treatment is optional for many uncomplicated port-wine stains. Some people choose treatment because the mark is becoming thicker, bleeds, affects the eye area, or causes unwanted attention. Others prefer not to treat it.

The main treatment is a pulsed dye laser , a vascular laser designed to target blood inside small vessels while limiting damage to nearby skin. The treated vessels absorb the laser energy and are gradually cleared by the body.

Laser treatment usually lightens a port-wine stain rather than removing it completely. Results differ between people and between areas of the body. Several treatment sessions are commonly needed. A stain may later darken again, so further sessions may be considered over time.

Treatment can cause temporary bruising, swelling, tenderness, or crusting. Less commonly, it may lead to blistering, scarring, or changes in skin colour. Skin containing more melanin can absorb some laser energy, so careful device settings and specialist experience are important.

Laser treatment can be performed in childhood or adulthood. Starting earlier may help in some cases because the skin and blood vessels are thinner, but useful lightening can still be possible later. Young children or people having a large area treated may need pain relief, sedation, or anaesthesia.

Protective eye equipment is essential when a laser is used near the eye. This treatment should be performed by a clinician with suitable training and equipment.

Thickened tissue or large nodules may not respond fully to laser treatment. Surgery or another procedure may sometimes be used to reshape the area or remove a troublesome growth.

Skin camouflage products can reduce the visible colour without changing the stain itself. Specialist camouflage services can help match products to different skin tones and show how to apply them. Counselling or peer support may also help if the birthmark affects confidence, school, work, or social life.

Complications

Most port-wine stains remain limited to the skin. Possible skin complications over time include thickening, an uneven surface, nodules, and bleeding after minor injury.

Glaucoma is an important concern when a stain affects the eyelids or nearby forehead. It can be present in infancy or develop later, which is why ongoing eye checks may be advised even when the first examination is normal.

Sturge-Weber syndrome can cause seizures, headaches, stroke-like episodes, weakness, learning differences, or developmental difficulties. A facial port-wine stain does not by itself confirm this syndrome.

Port-wine stains associated with limb overgrowth can occur alongside abnormal veins or

lymph vessels. This may lead to swelling, discomfort, differences in limb size, or problems with walking and footwear.

Visible birthmarks can also affect emotional well-being. Staring, questions, teasing, or pressure to hide the mark can be difficult at any age. Emotional support is a reasonable part of care, whether or not you choose physical treatment.

Prevention

A port-wine stain cannot be prevented. It forms before birth because of a change affecting a group of developing cells. It is not caused by anything a parent did or did not do.

Treatment does not prevent the original condition, but it may reduce colour, thickening, bleeding, or other effects. Regular eye assessment can help identify glaucoma early when the stain involves a higher-risk area.

Sun protection does not stop a port-wine stain from developing. However, protecting treated skin from strong sunlight may reduce irritation and unwanted pigment changes after laser therapy.

Living with it and what to expect

A port-wine stain is usually lifelong. It grows with the affected area rather than spreading like a rash. During childhood it may remain flat, although its colour can change.

Over months and years, some stains gradually darken from pink or red to deeper red or purple. Thickening and nodules are more likely later in life, particularly with facial stains, but this does not happen to everyone.

Laser treatment may produce long-lasting lightening, but the response cannot be predicted precisely. Some areas lighten well, while others change only slightly. Further treatment may be needed if colour returns or the skin becomes thicker.

Most people with an uncomplicated port-wine stain can take part in normal school, work, exercise, travel, and relationships. The mark is not contagious and does not need to be covered for medical reasons.

Routine follow-up is most relevant when the stain is near an eye, associated with neurological symptoms, affects a growing limb, or develops thickened or bleeding areas. Otherwise, follow-up may focus on treatment choices and changes that matter to you.

When to get medical help

Arrange a routine medical assessment if a birthmark may be a port-wine stain, particularly if it covers the forehead, eyelid, or a large part of the face. A stain associated with limb swelling, enlarged veins, or unequal limb growth also deserves assessment.

Make an appointment if the mark becomes noticeably thicker, develops a new lump, repeatedly bleeds, or starts causing pain. Changes may be treatable and do not automatically mean something serious.

Seek urgent medical care for new eye pain, a red eye with headache or nausea, or a sudden change in vision. These symptoms can be related to increased pressure in the eye.

Call emergency services for:

These symptoms are uncommon and are not expected with an uncomplicated skin-only port-wine stain.

- A first seizure or a seizure lasting unusually long
- Sudden weakness, facial drooping, confusion, or trouble speaking
- Sudden loss of vision
- Bleeding that does not stop with firm, continuous pressure

Common questions

Does a port-wine stain fade on its own?

Usually not. It may look lighter or darker at different times because of changes in blood flow, but it does not normally disappear. Some stains become darker or thicker with age.

Can a port-wine stain be completely removed?

Current treatment cannot reliably remove every port-wine stain. Pulsed dye laser treatment can often lighten the colour, sometimes substantially, but results differ. More than one session may be needed, and some colour can return.

Is a port-wine stain hereditary?

Most are not inherited. They usually result from a genetic change in a group of cells after conception rather than a gene passed down by a parent.

Does a facial port-wine stain mean Sturge-Weber syndrome?

No. Most facial port-wine stains do not mean that a person has Sturge-Weber syndrome. The possibility is higher with certain locations, especially the forehead and upper eyelid. Eye

assessment and specialist review can determine whether further investigation is appropriate.

Is a port-wine stain dangerous?

A skin-only port-wine stain is usually not dangerous. Its location can sometimes indicate a risk of eye, brain, or deeper blood vessel involvement. New seizures, sudden neurological symptoms, or changes in vision need urgent assessment.

Can makeup cover a port-wine stain?

Yes. High-pigment camouflage products can reduce the visible colour. A skin camouflage service can help choose a suitable shade and application method. Makeup does not alter the stain or interfere with future treatment once it has been removed from the skin.

Sources

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