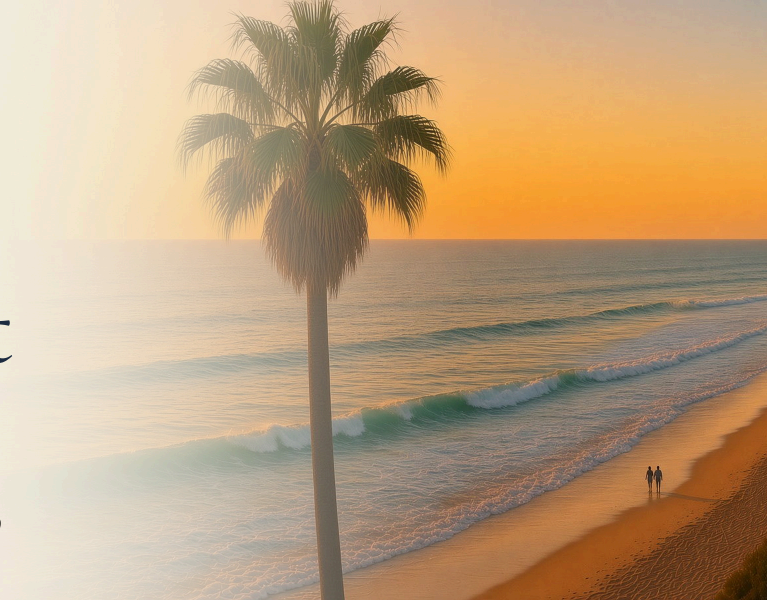
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When an Old Clot Doesn't Clear

High pressure in the lung arteries from old clots that turned to scar. It can often be cured.

2 to 4%
of people get CTEPH after a pulmonary embolism, roughly

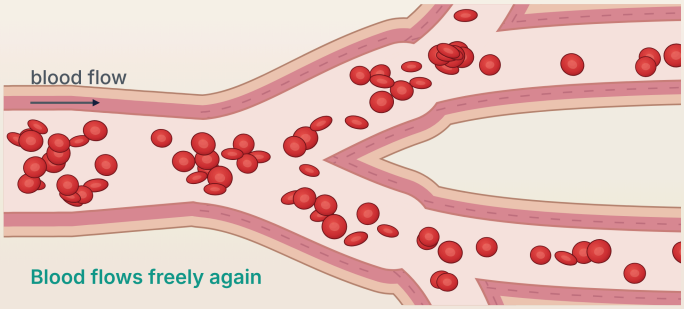
Up to ¼
of people with CTEPH have no known history of a clot at all

9 in 10+
are alive at three years with treatment at an expert center

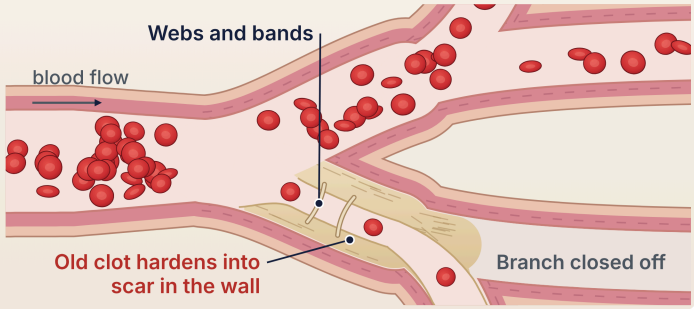
WHAT IT IS

Old clot that hardens into scar

1 Usually the clot clears



2 In CTEPH, part of it turns to scar



Most clots in the lungs dissolve on a blood thinner over the following weeks. In CTEPH, part of the clot stays behind and turns into tough, scar-like tissue built into the artery wall. Blood thinners can't dissolve it, because it isn't really a clot anymore. The narrowed arteries raise the pressure in the lungs, and the right side of the heart, a thin-walled pump built for an easy job, has to work much harder. The disease is in the lungs, but the organ that gives out is the heart.

HOW IT'S FOUND

The tests, in order

1 Three months first
At least three months on a full-strength blood thinner, so fresh clot has time to dissolve and anything left is the old, scarred kind.

2 V/Q scan
A tracer compares where air goes in your lungs with where blood flows. A normal V/Q scan essentially rules CTEPH out.

3 CT and catheter
A CT scan with dye shows webs, bands and closed-off arteries. A right heart catheterization measures the pressures and confirms it.

Ask about CTEPH

If you've had a pulmonary embolism and you're still breathless months later, or your breathlessness is unexplained and getting worse, ask about CTEPH by name and about referral to a specialized center. Early referral is the biggest factor in doing well.

SPOTTING IT AND TREATING IT

Symptoms, risks and the three treatments

SYMPTOMS TO WATCH FOR

they creep in slowly

Breathlessness	Shortness of breath that slowly gets worse, especially with exertion. You might get winded on stairs you used to take without thinking.
As the heart struggles	Fatigue is common. Later come lightheadedness, swelling in the legs and ankles, and sometimes pressure or fullness in the belly.
The clue to remember	Breathlessness that lingers or worsens in the months after a pulmonary embolism. That is not normal, and it deserves a real workup.

WHAT RAISES THE RISK

A past pulmonary embolism	The biggest risk factor, especially a large one, a repeat one, or one with no obvious cause.
Other conditions	Having your spleen removed, certain long-term implanted devices such as older pacemaker leads and shunts, past bloodstream infections tied to IV lines left in place, and chronic inflammatory conditions.
Clotting quirks	Antiphospholipid antibodies, found in about 1 in 10 patients, and persistently high levels of a clotting protein called factor VIII.

HOW IT'S TREATED

a team at an expert center

Surgery comes first	Pulmonary thromboendarterectomy (PTE) peels the old clot and scarred lining out of the lung arteries. It is the only treatment that can cure CTEPH, and at a high-volume center the risk of dying is around 2 percent. Everyone with CTEPH should be checked for surgery before any other treatment is chosen.
Balloon angioplasty	More than a third of patients have disease too far out in the small branches to reach, or an operation is too risky. Balloon pulmonary angioplasty (BPA) widens the narrowed vessels with a small balloon, one session at a time over several visits.
Riociguat	A medication approved for CTEPH that can't be operated on, or for pressures that stay high after surgery. It opens the lung arteries and improves how far people can walk. It doesn't remove the clot.
A blood thinner for life	For everyone, whatever other treatment you have. It won't dissolve the scar, but it protects you from new clots forming on top of it.

CALL 911

Warning signs	Fainting, chest pain, coughing up blood, or shortness of breath that suddenly gets worse. In pulmonary hypertension, fainting and chest pain can mean the right heart is failing.

AFTER TREATMENT

About a quarter of people still have some high pressure in the lungs after surgery, and that's where balloon procedures and riociguat come in. The small vessels of the lung can stay diseased too, so follow-up at an expert center continues for the long run.

READ THE FULL ARTICLE

damianrasch.com/cteph

For education only, and not a substitute for advice from your own physician. Sources include the 2022 ESC/ERS pulmonary hypertension guidelines, the 2021 ERS statement on CTEPH, Yang et al. (Chest 2023), Papamatheakis et al. (JACC 2020) and Kim et al. (European Respiratory Journal 2024).

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