

Extracorporeal carbon dioxide removal for acute respiratory failure

Information for the public

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What has NICE said?

There is not much good evidence about how well extracorporeal carbon dioxide removal (ECCO₂R) for acute respiratory failure works. It should only be used if extra care is taken to explain the serious but well-recognised risks and extra steps are put in place to record and review what happens.

What does this mean for me?

Your health professional should fully explain what is involved in having this procedure and discuss the possible benefits and risks with you or your next of kin. In particular, they should explain the uncertainty about the evidence on how likely it is to improve your symptoms. You should also be told how to find more information about the procedure. You or your next of kin should only be asked if you want this procedure after having this discussion. Your health professional should ask you if details of your procedure can be collected.

In an emergency, if you are unable to consent but it is in your best interests, healthcare professionals may give treatment immediately without obtaining your informed consent.

Your healthcare team

ECCO₂R should only be used by specialist intensive care teams trained in its use, and only in patients with potentially reversible acute respiratory failure or patients being considered for lung transplantation.

The condition

Acute respiratory failure is a life-threatening condition that results in abnormally low oxygen or high carbon dioxide levels in the blood. The conventional treatment for acute respiratory failure is mechanical ventilation. But, in some people, this causes lung injury.

NICE has looked at using [extracorporeal carbon dioxide removal](#) for acute respiratory failure as another treatment option.

[NHS Choices](#) may be a good place to find out more.

The procedure

Extracorporeal carbon dioxide removal (ECCO₂R) aims to reduce the level of CO₂ in the blood, and reduce the risk of lung injury with mechanical ventilation. In ECCO₂R, small tubes are inserted into large veins or arteries. The tubes are then connected to a special device that helps to remove CO₂ from the blood. ECCO₂R may be used for several weeks.

Benefits and risks

When NICE looked at the evidence, it decided that there was not enough evidence to know how well extracorporeal carbon dioxide removal (ECCO₂R) works. The 9 studies that NICE looked at involved a total of 1,073 patients.

Generally, they showed the following benefits:

- no difference in the number of people who died in hospital between those having ventilation with or without ECCO₂R
- a fall in CO₂ levels and a rise in oxygen levels in the blood after 24 hours
- an improvement in breathing within 24 hours.

The studies showed that the risks of ECCO₂R for acute respiratory failure included:

- complications in 8–32% of patients
- poor blood flow to the limbs in up to 9% of patients
- bleeding in the brain in 3 patients and in the lungs in 1 patient, treatment stopped because of bleeding in 7 patients, and local bleeding (where the tubes were inserted) in 2–12% of patients
- blood leaking from a hole in an artery in 4 patients
- blood clots in 2–19% of patients
- infection in up to 8% of patients
- compartment syndrome needing surgery in 2–4% of patients; 1 patient needed their lower leg amputated
- kidney and heart problems in 10% of patients.

If you want to know more about the studies, see the [guidance](#). Ask your health professional to explain anything you don't understand.

Questions to ask your health professional

- What does the procedure involve?
- What are the benefits I might get?
- How good are my chances of getting those benefits? Could having the procedure make me feel worse?
- Are there alternative procedures?
- What are the risks of the procedure?
- Are the risks minor or serious? How likely are they to happen?
- What care will I need after the procedure?
- What happens if something goes wrong?
- What may happen if I don't have the procedure?

Medical terms explained

Compartment syndrome

A painful and potentially serious condition caused by bleeding or swelling within an enclosed bundle of muscles.

About this information

NICE [interventional procedures guidance](#) advises the NHS on the safety of a procedure and how well it works.

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Accreditation

