NICE National Institute for Health and Care Excellence

NICE guidance

VA ECMO for postcardiotomy cardiogenic shock in adults

HealthTech guidance
Published: 18 December 2025

www.nice.org.uk/guidance/htg762

Your responsibility

This guidance represents the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, healthcare professionals are expected to take this guidance fully into account, and specifically any special arrangements relating to the introduction of new interventional procedures. The guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

All problems (adverse events) related to a medicine or medical device used for treatment or in a procedure should be reported to the Medicines and Healthcare products Regulatory Agency using the Yellow Card Scheme.

Commissioners and/or providers have a responsibility to implement the guidance, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity, and foster good relations. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties. Providers should ensure that governance structures are in place to review, authorise and monitor the introduction of new devices and procedures.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Contents

This guidance replaces IPG482 and IPG810.

1 Recommendation

1.1 Venoarterial extracorporeal membrane oxygenation (VA ECMO) can be used in the NHS during the evidence generation period as an option to manage postcardiotomy cardiogenic shock (PCS) in adults. There must be enhanced informed consent and auditing of outcomes.

What this means in practice

There are uncertainties around the safety and efficacy of VA ECMO to manage PCS. It could be used if needed while more evidence is generated.

After this, this guidance will be reviewed and the recommendations may change.

Healthcare professionals do not have to offer this procedure and should discuss the available options with the person with PCS (and their family and carers as appropriate) before a joint decision is made, if possible.

Hospital trusts will have their own policies on funding procedures and monitoring results. NHS England may also have policies on funding of procedures.

Enhanced informed consent

Because there are uncertainties about whether this procedure is safe and effective, there must be an emphasis on informed consent when possible. Healthcare professionals, when possible, must make sure that people (and their families and carers as appropriate) understand the uncertainty and lack of evidence around a procedure's safety and efficacy using NICE's advice on shared decision making and NICE's information for the public. Healthcare professionals must also inform the clinical governance leads in their organisation if they want to do the procedure.

Auditing of outcomes

Healthcare professionals doing this procedure should collect data on safety and outcomes of the procedure. Enter details about everyone having this procedure into the Extracorporeal Life Support Organization registry and regularly review the data on outcomes and safety.

Who should be involved with the procedure

Patient selection should be done by a multidisciplinary team. The procedure could be done in centres specialising in managing PCS and by healthcare professionals with specific training in this procedure.

What evidence generation is needed

Healthcare professionals must collect data specifically around the safety and efficacy of this procedure, including on:

- patient selection
- the technology used
- short- and long-term survival outcomes
- complication rates.

Why the committee made this recommendation

Some people with PCS do not survive being taken off a cardiopulmonary bypass machine after cardiac surgery. Evidence from observational studies suggests some of these people would survive if VA ECMO were used, and some people may benefit more than others. But there is a lack of good quality evidence.

VA ECMO is only suitable for a small number of people and is only available in a few hospitals. So, it would be difficult to do randomised controlled trials that include people with PCS. But other forms of data collection are possible. So, this procedure can be used in the NHS during the evidence generation period.

2 Information about the procedure

2.1 Extracorporeal membrane oxygenation (ECMO) can be used to manage postcardiotomy cardiogenic shock immediately after heart surgery, or to help separation from cardiopulmonary bypass.

2.2 In venoarterial ECMO, blood is taken from the venous system (usually from the femoral vein or the right atrium) and pumped through an oxygenator, where oxygen and carbon dioxide are exchanged. It is then returned to the arterial system, usually through the femoral or axillary artery or ascending aorta. People are usually given a continuous infusion of an anticoagulant, usually heparin, to prevent blood clotting in the extracorporeal system. For people with poor kidney function, a haemofiltration unit may be added to the circuit.

3 Committee discussion

The condition

3.1 Postcardiotomy refers to the period immediately after open-heart surgery. Postcardiotomy cardiogenic shock (PCS) is a rare but life-threatening situation that happens when the efficiency of the heart as a pump is impaired and it is unable to meet the body's needs. This means a person may be unable to be separated from cardiopulmonary bypass after open-heart surgery. Persistent cardiogenic shock cannot be managed with medicines alone.

Current practice

3.2 Treatment for PCS involves pharmacological treatments, including diuretics and inotropic agents, and mechanical circulatory support, including intra-aortic balloon pumps. Without using mechanical circulatory support, PCS has a very high risk of death, with mortality reported as high as 76%.

Unmet need

3.3 VA ECMO is used to provide cardiac and respiratory support for people with PCS. Unlike a heart–lung (cardiopulmonary) bypass machine, it tends to be used for days to weeks after surgery rather than for hours during surgery, allowing the heart time to recover. ECMO provides circulatory support and allows time for other treatments to promote recovery, or may be a bridge to a long-term mechanical solution or transplant. It aims to improve patient outcomes.

The evidence

3.4 NICE did a rapid review of the published literature on the efficacy and safety of

this procedure. This comprised a comprehensive literature search and detailed review of the evidence from 12 sources (13 publications), which was discussed by the committee. The evidence included 4 systematic reviews, 3 retrospective registry studies, 1 multicentre retrospective study and 4 single centre retrospective studies. It is presented in the summary of key evidence section in the interventional procedures overview. Other relevant literature is in the appendix of the overview.

3.5 The professional experts and the committee considered the key efficacy outcomes to be: restoration of organ function and bridging to recovery, transplant or long-term support.

3.6 The professional experts and the committee considered the key safety outcomes to be: bleeding, leg ischaemia, stroke, infection, renal failure and circuit-related complications.

3.7 Patient commentary was sought but none was received.

Committee comments

3.8 Clinical experts advised that some centres provide elective VA ECMO for people who are more likely to have PCS, and it is routinely used in some centres.

3.9 Clinical experts advised that VA ECMO can be done either peripherally or centrally. Central VA ECMO is used more commonly after cardiac surgery.

3.10 It would be difficult to do randomised controlled trials in people with PCS. So, other types of data collection such as registries could be useful.

3.11 The recommendations in this guidance include use of VA ECMO during pregnancy or in the postpartum period.

3.12 Clinical experts advised that this procedure could have a better outcome when it is used for post-transplant support because of primary graft dysfunction.

3.13 Some people who had VA ECMO have become organ donors and their organs

have been transplanted.

3.14 The committee was told that starting VA ECMO to manage PCS as early as possible is very important for better outcomes.

3.15 The committee was told that a high level of nursing expertise and input from a perfusionist are needed to support people on VA ECMO.

Equality considerations

3.16 Not all cardiac surgery centres specialise in using VA ECMO in the UK. So, people in some areas may not have access to this procedure.

3.17 Pregnancy and maternity are protected characteristics under the Equality Act (2010). Women, trans men and non-binary people with cardiogenic shock who are pregnant, or who have recently been pregnant, may need to access this intervention.

4 Committee members and NICE project team

This topic was considered by NICE's interventional procedures advisory committee, which is a standing advisory committee of NICE.

Committee members are asked to declare any interests in the technology to be evaluated. If it is considered there is a conflict of interest, the member is excluded from participating further in that evaluation.

The minutes of each committee meeting, which include the names of the members who attended and their declarations of interests, are posted on the NICE website.

Chair

Tom Clutton-Brock
Chair, interventional procedures advisory committee

NICE project team

Each evaluation is assigned to a team consisting of 1 or more health technology analysts (who act as technical leads for the evaluation), a consultant clinical adviser, a project manager and an associate director.

Xia Li, Jessica Wilcock and Helen Gallo
Technical leads

Amy Crossley
Technical adviser

Alan Ashworth
Consultant clinical adviser

Corrina Purdue
Project manager

Anastasia Chalkidou and Emily Eaton Turner
Associate directors

Update information

Minor changes since publication

January 2026: Interventional procedures guidance 810 has been migrated to HealthTech guidance 762. The recommendations and accompanying content remain unchanged

ISBN: 978-1-4731-7780-2

Endorsing organisation

This guidance has been endorsed by Healthcare Improvement Scotland.