NICE National Institute for Health and Care Excellence

Ex-situ machine perfusion devices for liver transplants

In the UK, more than 11,000 people die due to liver disease each year, and numbers are rising (British Liver Trust 2023). Liver transplantation is an effective treatment option for people with end-stage liver disease and some types of liver cancer. A liver transplant is surgery to remove a diseased liver and replace it with a healthy one from another person (donor).

People identified as needing a liver transplant are placed on a waiting-list for a donor liver. Demand for liver transplants is high and some people die on the waiting-list or are removed due to ill health before receiving a donor liver (NHS Blood and transplant 2024).

Livers are usually stored in ice between removal from a donor and transplant, to minimise damage. In the UK, many donor livers are discarded because clinicians are concerned about giving potentially lower quality livers to people. These decisions are based on the characteristics of the donor and the appearance of the liver because it is not possible to assess how well the liver is functioning during cold storage.

Ex-situ machine perfusion devices preserve the donor liver outside the body. The aims of these devices include increasing the number of livers suitable for transplant, extending how long the liver can be stored for to enable more flexibility in the timing of transplant operations and improving the outcomes of transplant recipients. Perfusion machines vary in many ways including the temperature at which they keep the donor liver. Some also allow assessment of liver function during preservation to help the surgeon decide if the liver is appropriate to transplant.

This topic has been identified by NICE for early value assessment (EVA).

The purpose of this assessment is to:

- review the evidence that is available and assess the potential clinical and cost-effectiveness of the technologies
- identify evidence gaps to help direct evidence generation in the future
- inform recommendations on the possible conditional use of these technologies in the NHS while further evidence is generated

Specialist committee member disciplines:

- Liver transplant surgeon
- Hepato-pancreato-biliary (HPB) surgeon

- Hepatologist
- Specialist in intensive care medicine (intensivist)
- Clinical perfusion scientist (perfusionist) involved in liver preservation (e.g., Advanced perfusion and organ preservation specialist [APOPS])
- Specialist Nurse in Organ Donation (SNOD)