

Machine perfusion

Machine perfusion

With the advances and improvements in outcomes in LT over the last four decades, there has been a focus on expanding deceased donor organs. Static cold storage (SCS) remains the standard-of-care preservation method in LT . This is achieved by cooling the liver to 4°C with preservation solution; this decreases cellular energy consumption by reducing the metabolic demand of the tissue. However, when these SCS organs are reperfused, there is a higher ischaemia-reperfusion injury owing to efflux of accumulated metabolic products formed during cold storage, resulting in a profound inflammatory immune response and causing damage to the hepatocytes and cholangiocytes, thereby leading to poor short- and long-term outcomes. One of the ways of reducing ischaemia-reperfusion injury is to perfuse the liver with cold solution (hypothermic machine perfusion; HMP) or warm blood (normothermic healthy endothelium, replenishing adenosine triphosphate (ATP) and thereby improving quality . This allows the organs to be preserved for a longer period prior to transplantation, thereby addressing the logistics of LT . Further studies will be needed to explore the ideal perfusion method with the aim of improving longer term outcomes and avoiding biliary complications such as ischaemic cholangiopathy and to study viability markers to identify livers that will not function in the recipient, allowing liver-directed therapeutic interventions on the machine. In other exciting technology - in situ normothermic regional perfusion (NRP) - the blood supply to the abdominal organs after death is restored using extracorporeal circulation for a limited period before organ recovery . This leads to superior liver outcomes in DCD livers compared with conventional organ recovery , and may be an answer to the problem of ischaemic cholangiopathy .

Revision #1

Created 2025-12-31 15:31:53 UTC by Omar Ayman

Updated 2025-12-31 15:31:53 UTC by Omar Ayman