

## HYPOTHERMIC AND NORMOTHERMIC MACHINE PERFUSION OF EXTENDED-CRITERIA DONOR LIVERS: A BAYESIAN NETWORK META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS AND MATCHED STUDIES

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**Background** : Ex vivo liver perfusion offers benefits over static cold storage (SCS) for organ preservation, but specific advantages of different perfusion protocols require further evaluation.

**Methods** : RCTs and matched studies conducted until December 2024 comparing ex vivo machine perfusion and SCS were evaluated. A Bayesian network meta-analysis was conducted to assess the effects of varying temperature settings, cannulation techniques, and perfusion duration in extended criteria donor (ECD) liver grafts. The relative perfusion time within total preservation time was assessed to distinguish between long-term and short-term perfusion.

**Results** : The meta-analysis included 11 hypothermic oxygenated perfusion (HOPE) studies and 10 normothermic machine perfusion (NMP) studies. Compared to SCS, HOPE reduced the risks of early allograft dysfunction (EAD) (risk ratio 0.46 [95%CI 0.31-0.67]), major complications (0.40 [0.25-0.63]), and acute cellular rejection (ACR) (0.47 [0.27-0.80]) (high-certainty). Compared to NMP, HOPE reduced the risks of EAD, non-anastomotic biliary stricture (NAS), total biliary complications (TBC), and ACR (moderate-certainty). HOPE reduced the risks of NAS in both single (0.18 [0.05-0.51]) and dual (0.32 [0.12-0.77]) cannulation settings compared with SCS (high-certainty). Compared to SCS, short-term and long-term HOPE prevented EAD (long-term: 0.41 [0.22-0.74]; short-term: 0.50 [0.29-0.84]), major complications (long-term: 0.48 [0.24-0.92]; short-term: 0.32 [0.15-0.64]), and NAS (long-term: 0.14 [0.02-0.56]; short-term: 0.30 [0.13-0.66]) (high-certainty). Compared to short-term NMP, long-term NMP reduced the risk of NAS (0.26 [0.07-0.93]) (high-certainty).

**Conclusions** : HOPE is more effective than NMP in preventing EAD, TBC, and NAS in ECD grafts. Both single and dual HOPE are effective, and early initiation of NMP is recommended to prevent NAS.