

Outcomes of DCD Heart Transplant Using Normothermic Regional Perfusion: A Systematic Review and Meta-Analysis

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ADMINISTRATIVE INFORMATION**Support** - None.**Review Stage at time of this submission** - Preliminary searches.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202510092**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 22 January 2025 and was last updated on 22 January 2025.**INTRODUCTION**

Review question / Objective Although the wide application of the normothermic regional perfusion (NRP) and direct procurement and perfusion (DPP) to recover the hearts from donation after circulatory death donors, it still remains unclear which of these 2 strategies yields optimal posttransplant outcomes. So we collect the data to figure out the effects of these two different processing methods to the hearts from donation after circulatory death donors.

Condition being studied There still exists argument about employing normothermic regional perfusion (NRP) with subsequent cold storage or employing direct procurement and perfusion (DPP) using the TransMedics Organ Care System to recover the hearts from donation after circulatory death donors and the donor shortages remain a challenge to both providers and patients, but there still do not have a clear evaluation of their effect.

METHODS

Search strategy A comprehensive literature search was performed on the 21st of January, 2025 using with the following MeSH and Emtree keywords: 'heart transplantation', 'regional perfusion'.

Participant or population The patients who have received heart transplantation, and the transplanted hearts were respectively coped with normothermic regional perfusion and direct procurement and perfusion.

Intervention Normothermic regional perfusion.

Comparator Direct procurement and perfusion.

Study designs to be included Cohort study.

Eligibility criteria We included studies in English of adult patients with heart transplantation, whose transplanted hearts from donation after circulatory death donors were protected with normothermic

regional perfusion or direct procurement and perfusion. The cohort studies were included in this study and review articles, animal studies, case reports of single patient and mathematical modeling studies were excluded.

Information sources The information sources are PubMed, Embase, the International Clinical Trials Registry Platform (ICTRP), and Cochrane Library.

Main outcome(s) Improved survival rate after heart transplantation.

Quality assessment / Risk of bias analysis The quality of all included studies was independently assessed by three reviewers (M.H and X.Q.Z and X.Y.W). Joanna Briggs Institute (JBI) were used to assess the study quality of cohort studies. Discrepancies in opinion were resolved by a consultation with 2 other reviewers (Q.M.Z and Y.N.L).

Strategy of data synthesis The continuous variables were presented as mean (\pm standard deviation) or median (interquartile range). Categorical variables were expressed as number and percentage (%). Heterogeneity was evaluated with the Cochrane X^2 test (Q) or I^2 delineating the proportion of the total variation attributable to heterogeneity beyond chance. When a p value less than 0.1 of the Cochran Q test or I^2 value greater than 50% implied significant heterogeneity, then a random effects model was utilized, otherwise a fixed effects model was applied instead.

Subgroup analysis Subgroup analysis is conducted by gender.

Sensitivity analysis Chi-square test.

Language restriction English.

Country(ies) involved China.

Keywords DCD; NRP; heart transplantation; meta-analysis.

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