

# Feasibility Evaluation of Sequential DHOPE-COR-NMP with PerLife

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## Background

Ex vivo liver perfusion (MP) can be performed according to many different protocols, depending on the goals of perfusion: ischemia-reperfusion injury (IRI) reduction/limitation, prolongation of the preservation time, improvement of the organ conditions and functions and viability assessment prior to transplantation.

Hypothermic MP (HMP, 4–10°C) helps organ preservation with reduced IRI thanks to ATP recharging. In contrast, normothermic MP (NMP, 37°C) aims to provide an approximately near physiological environment for organs, facilitating functional assessment. Controlled oxygenated rewarming (COR) is a halfway approach to rescue cold-stored marginal grafts by gentle oxygenated warming up, which may also have an IRI reducing effect.

The aim of this study is to evaluate the feasibility of a combined protocol HMP-COR-NMP performed with PerLife MP system, using grafts procured from DCD slaughterhouse pigs.

## Methods

Sequential use of HMP-COR-NMP was performed with PerLife MP in PerLiver operational mode according to the following protocol:

- 2h HMP;
- 1h COR with 15 minutes full liquid exchange (from HMP to Colloidal solution and Red Blood Cells (RBC) addition);
- 1.5h NMP with RBC-based solution.

Temperature settings (Figure 1-A) were manually changed, adjusting consequently also the arterial and venous pressures' targets (Figure 1-B). Gas supply was adapted to perfusion conditions.

## Results

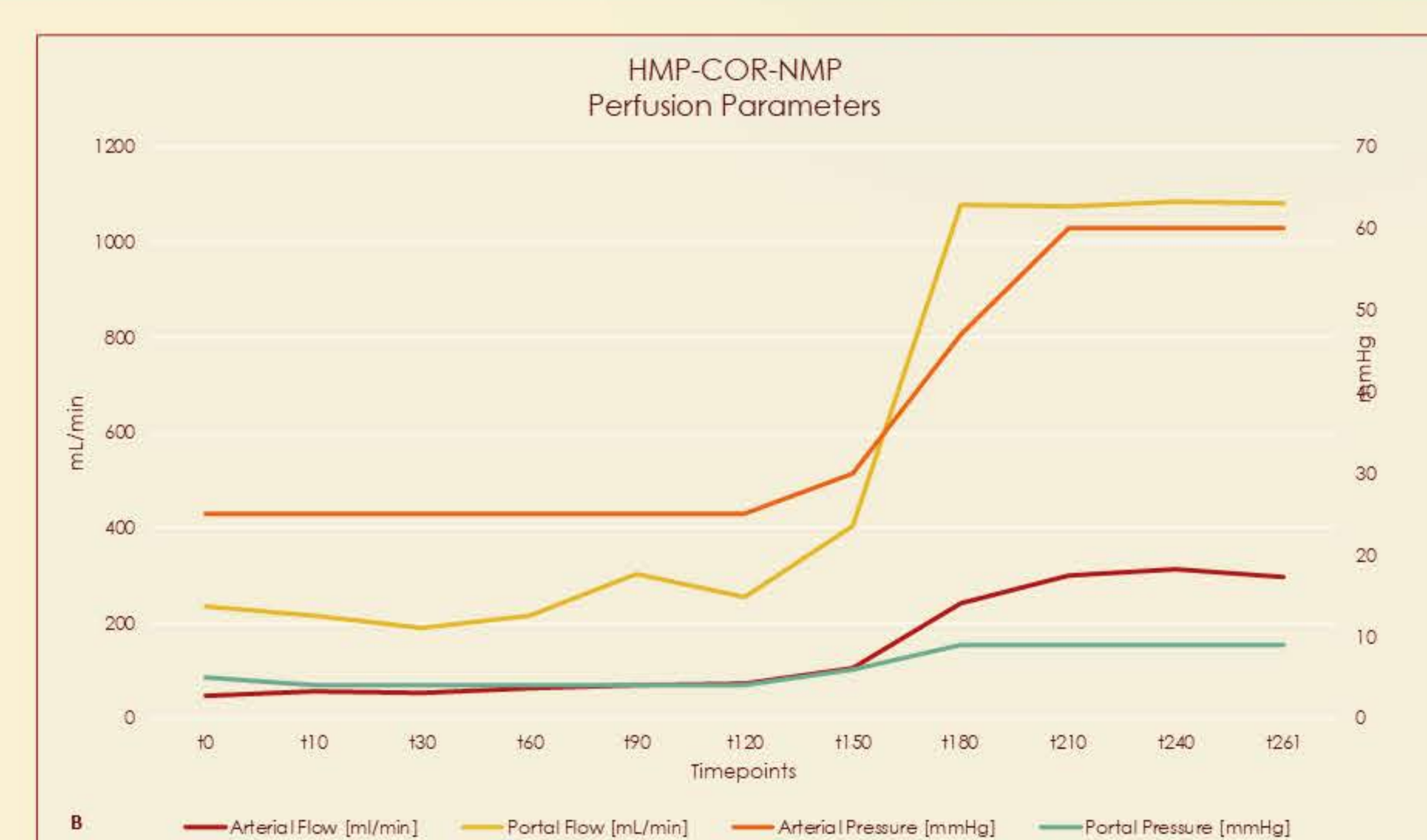
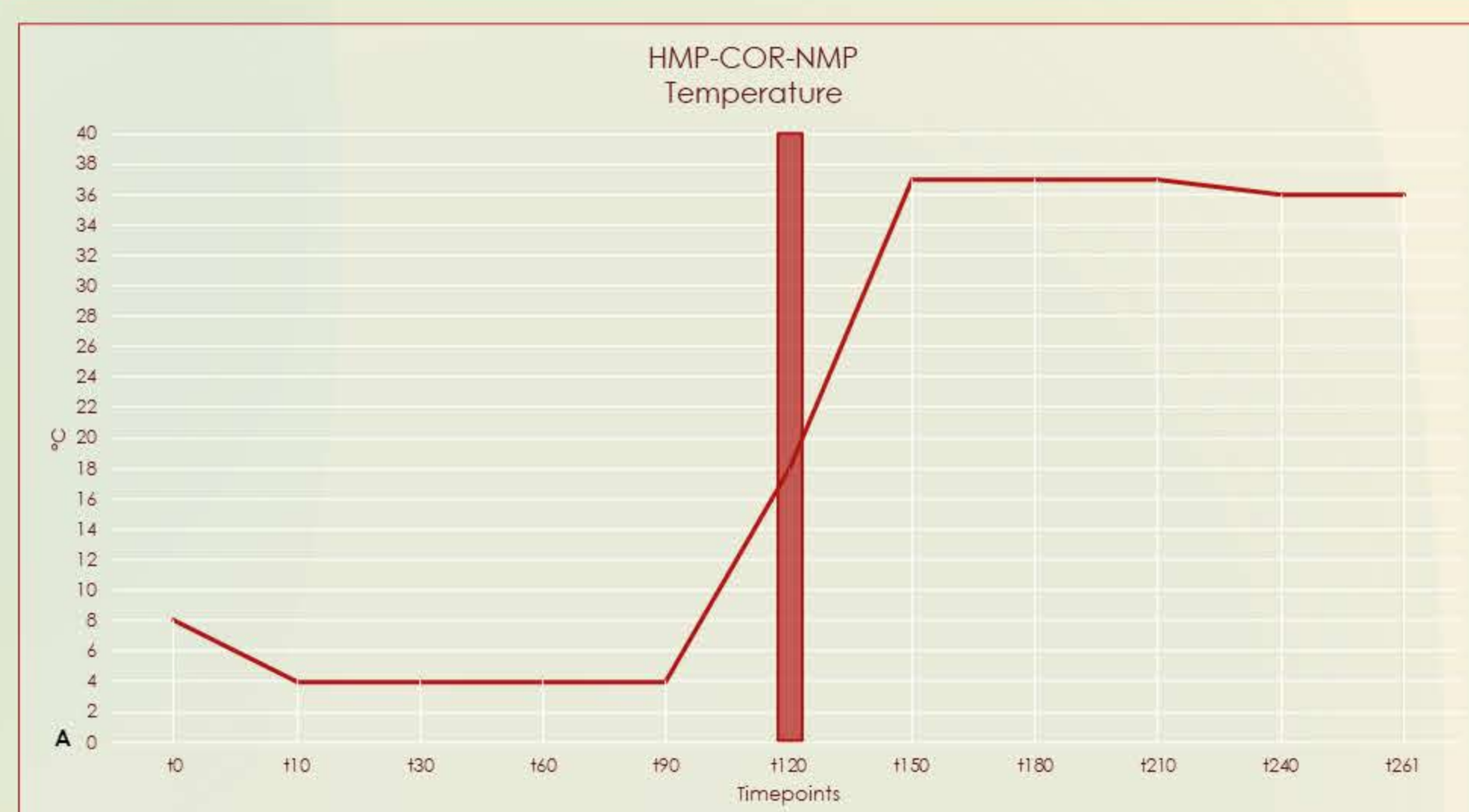


Figure 1: A - HMP-COR-NMP temperature settings and B - Perfusion Parameters

HMP started at 4°C temperature set. At 90 min, COR started and the temperature set was changed to 18°C, keeping 100% O<sub>2</sub> 2L/min supply as in HMP.

At 18°C, HMP liquid discharge and colloid-based additive-free liquid infusion started, with no perfusion interruption.

At 22°C, RBCs were added and 33%O<sub>2</sub>/67% N<sub>2</sub> at 2L/min was supplied.

After RBCs addition, temperature was set at 37°C and the NMP treatment started once it was reached.

## Conclusions

Sequential DHOPE-COR-NMP using PerLife was feasible.

The possibility of performing HMP-COR-NMP with no perfusion interruption is an interesting feature which should furtherly be explored in terms of temperature and other perfusion target settings.