The COPE project – research in organ preservation across six European countries

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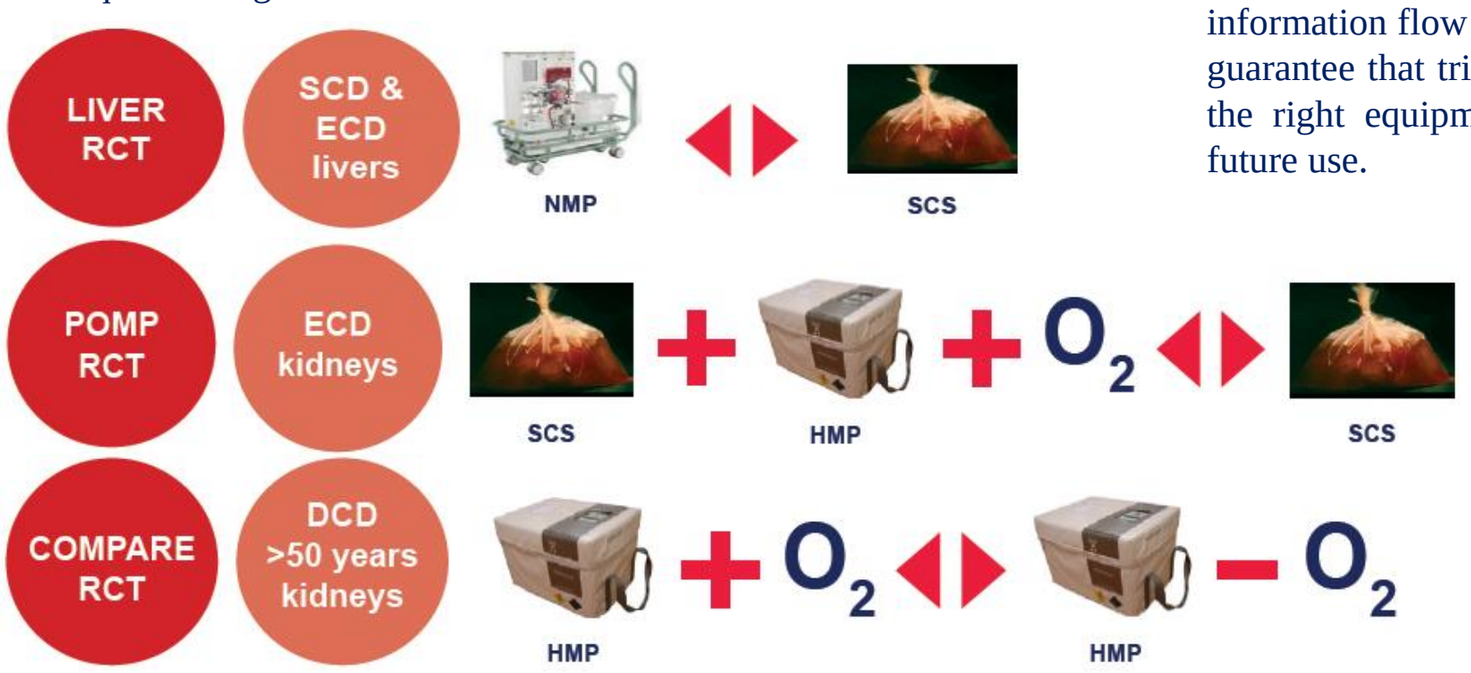
The transplant community is increasingly turning to deceased organ donors which previously would not have been considered suitable for transplantation, so called 'marginal' organ donors. The discard rate of these "high risk" organs is high and finding new ways of preserving them is crucial to ensure better organ utilisation. COPE – **C**onsortium for **O**rgan **P**reservation in **E**urope - investigates organ preservation techniques through three randomised controlled clinical trials:



COPE is also gathering a consolidated biobank using samples from the three RCTs to identify biomarkers for organ quality assessment. Additionally, COPE is investigating new preservation solutions in hypothermic and normothermic perfusion in a pre-clinical setting.

COPE's three RCTs …

- … are now recruiting across five European countries
- … involve a total of 26 participating sites
- … are at 93% of trial recruitment in the liver trial
- … randomised 73 ECD kidneys in the POMP trial
- … included 74 DCD donor pairs in the COMPARE trial

Current design of sample collection includes:

- donor and recipient blood, donor and recipient urine, liver and kidney tissue, bile duct tissue, perfusate and bile;
- unified sampling time points - after anaesthesia and before knife-to-skin time, after organ preservation and 1h post-reperfusion;
- several solutions or states for storage and assaying - formalin fixed paraffin embedded blocks, RNAlater and snap frozen tissue stored in liquid nitrogen vapour phase.

The unpredictable nature of transplantation and geographical spread of donor and recipient hospitals pose a particular challenge for COPE's trial logistics as data and sample collection have to be ensured for any donor and recipient procedure included in the trial irrespective of their location or timing. To overcome these challenges, COPE set up two separate teams of Transplant Technicians on the continent as well as in the UK operating within the Eurotransplant or NHSBT systems respectively.

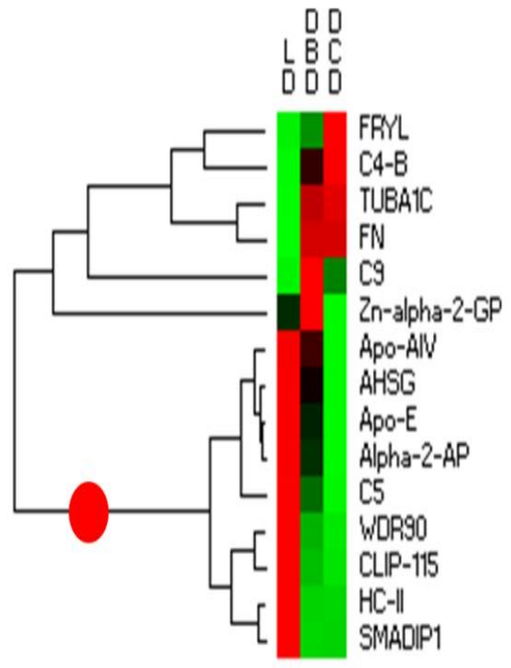
The Transplant Technicians fill a 24h on-call rota for the trials and have continuous access to all necessary trial equipment. Through different transport schemes including lease cars on the continent and a taxi scheme in the UK, transport to all participating Transplant Centres can be ensured at short notice. A reliable, swift and lean information flow has proven vital to ensure smooth trial processes and guarantee that trial staff reaches the right place at the right time with the right equipment. This set-up may be the prototype model for future use.

Research proposals from the network of COPE collaborators aim to address fundamental questions in organ preservation, repair and reconditioning, alongside supporting investigation of novel biomarkers for organ quality and quality assessment. The application of state of the art 'omics technologies (transcriptomics, proteomics, metabolomics) will allow for the identification of molecular signatures and profiles in blood, perfusate and biopsy samples. Such profiles or "fingerprints" can be further correlated with clinical outcomes, creating the basis of a new platform for organ quality assessment.

Additionally by identifying thousands of proteins from a single sample, unbiased "shotgun" proteomics approaches will potentially allow for the identification of novel biomarkers of organ quality and/or validation of existing injury markers.

At the end of its lifetime, the COPE programme hopes to deliver:

- more insight into how high risk donor livers and kidneys may be assessed and monitored identifying clinically relevant markers;
- whether the addition of oxygen during kidney preservation is beneficial;
- if continuous (oxygenated) kidney perfusion trumps static cold storage with end-perfusion;
- how important the role of NMP is when compared to conventional liver static cold storage.



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