

Hypothermic Perfusion for Organ Preservation: Back to the Future in 2005

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In the early days of transplantation, organs to be used for transplantation were stored by continuous cold perfusion (CCP) in the period between removal from the donor patient and subsequent grafting. However, the equipments for CCP were unreliable, costly and difficult to transport between hospitals. Therefore, during the past 20 years, clinical organ transplantation across the UK and Europe has developed on the basis of the 'cold flush' method where organ have been preserved on ice after vascular flush with specially-designed cold flush solutions. The main cold flush solution has been University of Wisconsin solution, but others have also been developed. However, over the years, the success of organ transplantation has meant that there are growing numbers of patients who could benefit from transplantation, but a shortage of suitable donor organs. This has led to a great pressure to expand the criteria for accepting less-than-optimal organs which have experienced considerable warm hypoxia before cold preservation (the so-called non-heart beating donor – NHBD organs). Experimental evidence has shown that continuous cold perfusion with oxygenated solutions can repair some of the damage which took place in the NHBD organs and so the preservation period can be used to 'rescue' and improve these organs to achieve good results in transplantation. This has led to the development in the past 2 years of a new generation of hypothermic perfusion machines for kidneys and livers, which are being studied in trials in Europe. These developments will be discussed.

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