Organ preservation

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Static cold storage (SCS) has remained the gold standard preservation method for the pancreas graft since the first trans - plantation was performed in 1966. SCS is the most common preservation method for organs after retrieval because of its simplicity , relative e ff ectiveness for many org ans and low cost. Hypothermic preservation is based on the principle that cooling an organ reduces the metabolic rate and the demand for adenosine triphosphate (ATP). The pancreas is extremely sensitive to both warm and cold ischaemia, which has a significant impact on preservation. Once retrieved from the donor, the pancreas is inspected for any damage and for adequacy of perfusion and then submerged in preservation solution within an organ bag and placed in an icebox for transport to the transplant centre. Unlike other organs the pancreas is not flushed following retrieval in order to minimise endothelial damage and (supposedly) to reduce the risk of early graft pancreatitis and thrombosis. Early pancreas transplants su ff ered from a significant thrombosis rate of up to 25%. For this reason, in 1986 Belzer and Southard set out to redefine the needs of pancreas preservation by developing a new pres - ervation solution. This new solution – University of Wisconsin (UW) solution – was first successfully applied in experimental pancreas transplantation; this study was published by Wahl - berg, who was a member of the Wisconsin group. T he colloid constituent, hydroxyethyl starch (HES), was particularly important in the pancreas, especially in suboptimal organs and those with longer cold ischaemia times. Translation to clinical use of the UW solution led to a significant improvement in the results of pancreas transplantation and a marked reduction in pancreatitis and thrombosis of the grafts. There have been studies in experimental pancreas preser - vation using hypothermic machine perfusion; in these studies the organ is continuously pumped with a cooled solution, but this has yet to translate into clinical practice, although recent r esults are promising. Normothermic machine perfusion of pancreases has been performed on animal and discarded human organs but led to organ injury , possibly because of - Normothermic regional perfusion is a technique in which, following cessation of circulation in a DCD organ donor, the donor blood is warmed, oxygenated and then pumped back around the abdominal organs. This appears to be beneficial in the context of the liver, but has yet to show convincing data in pancreas transplantation – the numbers studied are small and the technique is still in its infancy . Summary box 90.2 Organ donation and preservation /uni25CF /uni25CF /uni25CF

The majority of pancreas transplants (75%) are from DBD donors The pancreas is the most frequently damaged organ during retrieval, which can impact on clinical outcomes SCS remains the gold standard of preservation, although research into machine perfusion is gaining momentum

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