

Static cold storage

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Hypothermia suppresses metabolism to maintain organ viability . The first requirement is to flush the donor organs with an appropriate preservation solution at a temperature of approximately 4°C (Figure 88.3). This is normally done in situ via cannulae placed in the donor aorta and portal vein. This process has three effects: (i) it flushes blood out of the microcirculation to prevent thrombosis; (ii) it cools the organs to a temperature of <5°C and so reduces tissue oxygen requirements; (iii) it replaces the normal extracellular fluid with the preservation fluid. Sir Hans Adolf Krebs , 1900–1981, Professor of Biochemistry , University of Oxford, Oxford, UK. electrolytes, an impermeant and a buffer. In general, the + ion concentration electrolyte composition mimics the high K + and low Na ion concentration of intracellular fluid. This eliminates ionic fluxes, and therefore the movement of H₂O across cell membranes. Impermeants such as mannitol, lactate and raffinose are large osmotically active molecules. They cannot pass through the cell membrane and remain in the extracellular space. Here, they prevent cellular swelling by counteracting the osmotic force from intracellular proteins. The buffer component of preservation fluids is based on either 3- HCO or PO and acts to maintain a stable physiological pH 7.3–7.4 in the extracellular space. A number of different preservation solutions are available, but the University of Wisconsin (UW) solution is widely regarded as the current gold standard.

Figure 88.3 After removal from the donor, the kidney is flushed with chilled organ preservation solution and, if necessary, stored briefly on ice until transplanted into the recipient.

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