PERFADEX® – A SOLUTION FOR OPTIMAL PRESERVATION OF DONOR LUNGS
PERFADEX® is a lightly buffered ‘extracellular’, (low [K+]i) colloid-based electrolyte preservation solution for rapid cooling, perfusion and storage of organs in connection with transplantation. The composition of PERFADEX® has been specifically formulated to preserve the function and integrity of organs rich in endothelium, during flushing and cold ischemic storage, prior to transplantation and reperfusion. The colloid component, dextran 40, particularly protects the microvasculature against post-ischemic reperfusion injury, primarily by preventing pathological leukocyte-endothelial interaction14,15. It also prevents edema and counteracts thrombosis16,17,22.

Over recent years, a wealth of experimental and clinical documentation has shown PERFADEX® to provide unrivalled preservation of organs rich in vascular endothelium such as lung tissue. PERFADEX® is an ideal solution for the preservation of vascular grafts, pancreas and lungs in particular17. It may also be used as a vehicle for other organ-specific electrolytes or active components such as scavengers, immunosuppressant’s or gene therapy23,24,25.

In comparative clinical trials preservation with PERFADEX® significantly improved early lung function and reduced 30-day mortality to half9,10,11.

PERFADEX® was the first solution to be specifically cleared by the FDA for the preservation of human lung. In the USA, the use of PERFADEX® for preservation of tissues and organs, other than lungs has not been approved by the FDA.

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**COMPOSITION** – PERFADEX® contains 5% dextran 40 (Mw 40 000), Na+ 138 mmol, K+ 6 mmol, Mg2+ 0.8 mmol, Cl 142 mmol, SO42- 0.8 mmol, H2PO4- plus HPO42- 0.8 mmol and glucose 5 mmol.

ADDITIVES – Adjust to about pH 7.4 shortly before use by addition of 1 mmol THAM/TRIS (trometamol or tromethamine) per litre PERFADEX®. The solution should be kept chilled and used within 24 hours.

**HOW SUPPLIED** – PERFADEX® is supplied in 1000 mL or 2800 mL (PVC bags)

In USA PERFADEX® is supplied with THAM

**HOW SUPPLIED:**
REF 19001; 8 x 1000 mL
REF 19002; 2 x 2800 mL
REF 19017*; 8 x 1000 mL
REF 19018*; 2 x 2800 mL
*REF number used in the USA
The lung is primarily composed of endothelial cells which line the enormous surface area of the capillaries (equivalent to an entire tennis court) and a similar surface area of types I and II epithelial cells which line the alveoli and secrete surfactant respectively. The endothelium is the most vulnerable and plays a critical role for the structure and function of a normal vessel wall. Endothelial cells produce a variety of biologically active substances that control vascular permeability, vessel tone, coagulation, fibrinolysis and inflammatory responses. Some of these substances, such as proteins which seal the junctions between cells (adhesion molecules) are integral parts of the cell structure. Others, such as nitric oxide (NO), prostacycline, chemokines, or factors involved in coagulation and fibrinolysis, are produced and then released by the endothelial cells either luminally or abluminally.18

WHAT CAUSES DAMAGE TO THE ENDOTHELIUM? A number of factors can injure the pulmonary endothelium during the manipulation and temporary storage involved in the harvesting of donor lungs; • Traumatic manipulation during harvesting, evaluation and transplantation • Excessive pressure • Low temperature – particularly below 4°C • Storage solution – e.g. intracellular type (high K+) solutions • Prolonged cold ischemia • Ischemia-reperfusion – free radical injury

CONSEQUENCES OF AN INJURED ENDOTHELIUM Injured endothelium can induce platelet and leukocyte sticking which then triggers a number of inflammatory cascades including increased permeability of the capillary wall, which in turn increases tissue edema and the risk of Primary Graft Dysfunction (PGD). A well preserved endothelium is antithrombogenic, yet promotes platelet aggregation and coagulation if injured19,20.

THE IMPORTANCE OF AN INTACT ENDOTHELIUM Experimental and clinical evidence indicates that early ischemia-reperfusion injury to the endothelium, within the very first few hours of reperfusion, is a key trigger in initiating the cytokine cascades which eventually lead to PGD and subsequent graft failure often months or years later25. This early injury can be prevented or mitigated by minimizing physical injury (manipulation) and storing the lungs in a protective solution under optimal temperature conditions21.

REFERENCES
22. Arfors K-E, Buckley, PB, Bailliere’s Clinical Anaesthesiol. 1997; 11,1,15-47

WE EMPOWER TRANSPLANT TEAMS TO SAVE MORE LIVES

XVIVO Perfusion AB, Box 53015, SE-400 14 Göteborg, Sweden. Tel +46 31 788 21 50, fax +46 31 788 21 69. order@xvivoperfusion.com www.xvivoperfusion.com