Ex vivo assessment with STEEN Solution™ can expand your donor lung pool. About four of every five lungs offered for transplantation are currently rejected by present selection criteria. However, rejected lungs from marginal and extended donors have been successfully used for transplantation for almost 2 decades and the concept has now become routine practice.

The ex-vivo assessment of marginal lung function, including gaseous exchange at 37 °C, was re-ignited by Steen et al and has since been adopted and modified by other centres. The method is now an established clinical routine in most major lung transplant centres worldwide.

With EVLP, the perfusion circuit of the lung mimics in-vivo conditions; the ventilated lung is perfused with deoxygenated STEEN Solution™ with or without red cells and the critical parameters of gaseous exchange, pulmonary vascular resistance and other key variables under normothermic conditions are monitored.

The STEEN Solution™ perfusate and circuitry can maintain stable lung function, without edema formation, for up to 10 hours at 37 °C.

STEEN Solution™ is intended for assessment of isolated lungs after removal from the donor body for eventual transplantation into a recipient.

HOW SUPPLIED: REF 19004; 500 mL bottle

Humanitarian Device. Authorized by Federal law in the USA for use in flushing and temporary continuous normothermic machine perfusion of initially unacceptable excised donor lungs during which time the ex-vivo function of the lungs can be reassessed for transplantation. The effectiveness of this device for this use has not been demonstrated.
STEEN Solution™ is a buffered extracellular solution that includes human serum albumin to provide an optimal colloid osmotic pressure and dextran 40 to coat and protect the endothelium from excessive leucocyte interaction. STEEN Solution™ is designed to facilitate prolonged evaluation and promote stability of isolated lungs ex vivo.

STEEN SOLUTION™ CONTAINS

- Human Serum Albumin – provides normal oncotic pressure preventing edema formation
- Dextran – a mild scavenger which coats and protects endothelium from subsequent excessive leucocyte interaction and thrombogenesis
- Extra-cellular electrolyte composition (low K+), reduces free radical generation and avoids vascular spasm under normothermic conditions.

MAINTAINS STABILITY OF ISOLATED LUNGS EX VIVO

STEEN Solution™ facilitates prolonged evaluation and promotes stability of isolated lungs ex vivo. The lungs are enclosed in the transparent container, XVIVO Organ Chamber™, to maintain optimal humidity.

The “venous” afferent side of the closed circuit is connected to a pump and a heat and gas exchanger so that the perfusate - STEEN Solution™ (with or without red blood cells) - assumes physiological temperature and partial gas pressures. A leucocyte filter is connected before the inflow to prevent leucocyte-induced tissue injury. Perfusion pressure is closely monitored and should never exceed 20 mm Hg.

Since the lungs are generally cold before perfusion, initial flow rates must be very low, gradually increasing as the temperature increases.

The flow should never exceed 4 l/min. Careful ventilation is begun as the temperature of the perfusate outflow reaches 32 °C and full ventilation is begun as it reaches 37 °C.

Functional assessment can begin when the circuit has reached the steady state described above, monitoring arterial and venous blood gases, end-tidal carbon dioxide and a range of hemodynamic parameters.

REFERENCES