The perioperative care of lung transplant patients is one of the most formidable challenges clinicians face. As we learn more about the role of endogenous nitric oxide (NO) and the role of vascular endothelial cells in cardiovascular and pulmonary disease, inhaled nitric oxide (INO) therapy has generated a great deal of interest. Lung transplantation candidates often have end-stage organ disease associated with hypoxemia and pulmonary hypertension, which complicates their care. The role of endogenous NO in chronic hypoxia remains unclear. The most widely accepted theory at present is that development of chronic hypoxic hypertension is due to endothelial dysfunction. This is important in the perioperative period because the severity of pulmonary hypertension increases the risk of complications during heart or lung transplantation. The exact mechanism by which prolonged alveolar hypoxia produces pulmonary hypertension remains unknown. INO, as a selective pulmonary vasodilator, appears to be an attractive therapy for modulating pulmonary vascular tone lung transplant patients. Unlike intravenously administered pulmonary vasodilators, INO reduces PVR without producing systemic vasodilation. INO is selective for pulmonary vasodilation because it is rapidly inactivated on binding to hemoglobin. Because INO dilates ventilated regions of the lung, ventilation and perfusion (ventilation-perfusion ratio [V/Q]) matching often improves, and arterial oxygenation increases.

The clinical use of INO in patients receiving lung transplants. The preoperative (diagnostic) use of INO for pulmonary vascular reactivity testing, its use as a potential bridge to transplantation, applications in graft protection and preservation, its use during surgery and in the postoperative period, and dosing and timing is very important.