

Over the last 55 years lung transplantation has evolved from an experimental procedure to established therapy for many patients suffering from end stage pulmonary failure. Approximately 4000 lung transplants are being performed annually with many institutions around the world opening new programs to meet their local need. Despite its many successes, the field of lung transplantation faces many challenges. These include a relative shortage of donor organs and persistently inferior long-term outcomes compared to other solid organs.

This book provides state of the art reviews and perspectives from leading groups on topics that are highly relevant to lung transplantation, both clinically and experimentally. Surgeons from Duke University, the site of one of the largest and most experienced lung transplant programs in the world, review their institutional experience and also discuss the expanding use of extracorporeal membrane oxygenation in the care of lung transplant patients. The lung transplant group at The Ohio State University provides an overview of indications and outcomes for pediatric and adult lung transplantation. Along these lines, physicians from The Prince Charles Hospital in Brisbane describe therapeutic options for patients suffering from COPD, which continues to be one of the most common indications for lung transplantation. The Toronto lung transplant group reviews ex vivo lung perfusion, which has been one of the most important advances in this field in the recent past. Not only has the Toronto lung transplant group established that this technique allows for an evaluation and optimization of potentially marginal donor lungs, but, perhaps more importantly, ex vivo lung perfusion will hopefully provide a platform to target cellular and molecular pathways that are potentially deleterious. Undoubtedly, ex vivo lung perfusion has contributed to a reevaluation of lung donor selection criteria, a topic that is reviewed by surgeons from the University of Pennsylvania and The University of Louisville. Animal studies have paved the way for the first attempts at human lung transplantation and have played an instrumental role in refining and perfecting surgical techniques. Technical aspects of bilateral sequential lung transplantation are reviewed by the group at The University of Pittsburgh and techniques for airway anastomoses, widely perceived to be a barrier to successful lung transplantation in the early days, are reviewed by the thoracic surgical group at The University of Rome, which is renowned for their work in airway reconstructions. Advances in lung transplantation and improvements in long term survival will depend on gaining a better understanding of the unique nature of immune responses to pulmonary grafts. Pre-clinical murine models of lung transplantation enable investigators to design experiments that shed mechanistic insight into pathways that contribute to primary graft dysfunction, acute rejection and chronic lung allograft dysfunction. To this end, the group at Washington University in St. Louis summarizes their experience with orthotopic mouse lung transplantation and also describes technical aspects of lung re-transplantation in the mouse. Studies in these models have already suggested that immunosuppressive strategies that are currently used for lung transplant recipients, reviewed by the group at Columbia University, may not be optimal or even be deleterious for these patients. This is in large part due to the fact that immunosuppression used for lung recipients has been designed based on the experience with recipients of other grafts such as kidneys and livers without taking organ-specific differences in immune responses into account.

Thus, this book represents a collection of contemporary topics that are highly pertinent for health care professionals, who are involved with the care of lung transplant patients, as well as for investigators, who are engaged in the study of pulmonary transplantation biology. Lung transplantation has come a long way. Undoubtedly, new discoveries regarding the biology of lung transplantation will ultimately result in personalized treatment approaches and improved outcomes for our patients.



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