



Advances in the Anesthetic Management of Solid Organ Transplantation

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Keywords

- Anesthesia • Kidney transplant • End-stage renal disease • Liver transplant
- End-stage liver disease • Preoperative evaluation

Key points

- Preoperative evaluation of solid organ transplant candidates requires a multi-system approach; attention to cardiovascular pathology is necessary.
- A critical intraoperative goal of kidney transplantation is to provide ideal hemodynamic conditions for the newly transplanted organ.
- Understanding of the multisystem nature of end-stage renal disease and end-stage liver disease is fundamental to the management of transplant recipients.
- Intraoperative management of liver transplantation requires expertise in critical care concepts, including advanced hemodynamic monitoring, transfusion medicine, and coagulation management.

INTRODUCTION

Organ transplantation has grown on a worldwide scale since its early development in the 1960s and has increased in both developed and developing countries. Advances in surgical techniques and immunosuppression have contributed to steady improvements in graft and patient survival rates. In concordance with the growth of solid organ transplantation, the anesthetic care of transplant patients has progressed as well. Anesthesia specialization in organ transplantation has resulted in a large body of research and clinical

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expertise in this exclusive surgical population. Many future challenges will impact the field, including the aging of transplant candidates, an imbalance between the supply of donor organs and candidates, and unique ethical and financial issues. Nevertheless, anesthesia practitioners with expertise in the perioperative care of solid organ transplant patients are well-positioned to provide vital services for this dynamic surgical population.

This review focuses on the anesthetic management of kidney transplant (KT) and liver transplant (LT) recipients for chronic liver failure. For the anesthetic management of pancreas and intestinal transplant recipients, published reviews are suggested [1,2]. Likewise, a review of the management of acute liver failure is suggested [3]. The distribution of solid organ transplants in the United States during 2015 is displayed in Table 1 [4].

ANESTHESIA FOR KIDNEY TRANSPLANTATION

KT is the most common solid organ transplant performed world wide, with growth in all geographic regions of the world. The prevalence of end-stage renal disease (ESRD) has increased over the past 3 decades in the United States, resulting in escalating demand for organs that outpaces supply. Since 2005, the number of KTs performed in the United States has continued to increase; in 2015, a total of 17,878 procedures were performed [4]. Although there has been a steady annual increase in the number of patients awaiting KT, in 2015 the total number of patients awaiting KT decreased for the first time in 10 years [5]. An increase in the number of patients removed from the waitlist because of medical comorbidities, classified as too sick for transplantation, was partially responsible. The number of candidates removed for medical conditions in 2015 was 4154 compared with 1533 in 2010; this trend reflects the aging of KT candidates [5]. The most common etiology of ESRD in KT candidates in 2015 was diabetes, a trend that has continued for many years [5]. Current disease patterns in KT candidates reflect the increasing prevalence of diabetes, hypertension, obesity, and the metabolic syndrome in the general population.

Recent adjustments in organ allocation policies have affected KT patterns as well. In December 2014 the Organ Procurement and Transplantation

Table 1
US solid organ transplants: 2015

Organ	Number of transplants
Kidney	17,878
Liver	7127
Kidney/Pancreas	719
Pancreas	228
Intestine	141

From United Network of Organ Sharing. Annual report 2015. Available at: <https://www.unos.org/about/annual-report/>. Accessed February 25, 2017.

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