# ADVANCES IN HEPATOLOGY

Current Developments in the Treatment of Hepatitis and Hepatobiliary Disease

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## Highlights From the Recent AASLD AST Practice Guideline on Adult Liver Transplantation and Graft-Related Complications

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**G&H** Why was there a need to develop this recent practice guideline on adult liver transplantation?

**EV** Liver transplantation is a critical aspect of liver disease care, for which up-to-date and evidence-based guidelines are essential to ensure that providers have the information they need to help their patients to the best of their abilities. Liver transplantation is also a rapidly evolving field, and the last guideline that the American Association for the Study of Liver Diseases and the American Society of Transplantation came together to publish was in 2014. In the past decade, there have been many important changes, including new data on immunosuppression medications and antirejection regimens. There have also been significant updates in terms of the epidemiology of chronic liver disease that have important implications for how providers care for patients. Additionally, new innovations such as the utilization of machine perfusion have rapidly changed the field. In fact, there was so much to cover that adult and pediatric liver transplantation have been divided into 5 guideline documents: 2 for pediatric liver transplantation and 3 for adult liver transplantation, including this one on graft-related posttransplant management. This guideline, which covers graft issues such as immunosuppression and recurrent disease, was released online on August 22, 2025 before print publication in *Liver Transplantation*. The other guidelines are in progress and are expected to be released over the next few months.

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**G&H** What else is new about this guideline over prior guidance?

**EV** There are many new recommendations in this guideline. There is an in-depth review of the impact of the type of graft, such as from living donors and donation after cardiac death, on outcomes, including survival and surgical complications. There is a large focus on the utilization of machine perfusion devices, which constitutes a major update in the last few years that has rapidly changed many aspects of the way liver transplantation is practiced. There is a nuanced discussion of immunosuppression selection for patients with different traits that includes the evidence surrounding immunosuppression withdrawal, as well as updates on different types of rejection and their treatments. Finally, because of the shifting epidemiology of chronic liver disease that leads to transplant, with a rapid rise in the number of patients with steatotic liver disease (both metabolic dysfunction-associated steatotic liver disease [MASLD] and alcohol-associated liver disease), management of recurrent disease after transplant is incredibly

important. There is, therefore, a real emphasis on how to prevent and treat recurrent disease. The increase in alcohol-associated liver disease and MASLD indications for liver transplant has large implications for posttransplant care, including the need for a multidisciplinary approach to the treatment of alcohol use disorder, obesity, and metabolic comorbidities.

Finally, one additional important update in this series of guidelines is the inclusion of the level of evidence grading for every recommendation to ensure transparency for the reader regarding the quality of evidence underlying each recommendation.

### G&H Are there different posttransplant recommendations for patients who receive a graft from living donation vs deceased donors?

**EV** Nothing specifically needs to be done differently in the posttransplant care of transplant recipients with living vs deceased donors in terms of immunosuppression. The guideline does state that it is important to be aware that livers from living donors can have higher rates of some surgical complications (eg, biliary complications) in the early posttransplant period, so providers should be vigilant for those. However, I think it is very important that the guideline highlights the fact that, despite small increases in the rates of these complications, overall transplant survival from the time of listing is better for patients who have living donors available. This is largely because these patients can be transplanted at lower Model for End-Stage Liver Disease scores and in a controlled environment with very careful selection of the graft. Therefore, although it is possible that these patients have higher rates of biliary complications, all patients should be educated about living donor liver transplant at the time of their listing and that the outcomes for living donor transplant are excellent.

> … the guideline provides many important recommendations around individualizing immunosuppression, both early after the transplant as well as for the long-term maintenance regimen.

### G&H How do machine perfusion devices affect posttransplant complication rates?

**EV** To date, the data show that the utilization of machine perfusion devices probably decreases important graft complications, such as early allograft dysfunction and ischemic cholangiopathy, when utilized with organs that tend to have high rates of these complications, such as extended criteria donors and donation after circulatory death organs. One of the important changes in this guideline is that there are recommendations for the use of machine perfusion devices in some of these higher-risk organs, not only because they decrease these complications, but also because they likely have the potential to expand the pool of donated organs available that can be safely transplanted into recipients on the waiting list.

### G&H Given that more expanded donors are being used, should living donation be decreasing or considered differently?

**EV** Even with the use of machine perfusion and the expansion of the utilization of extended criteria donors, there is still overall a profound organ shortage. In addition, living donor grafts tend to be of excellent quality. Therefore, living donor liver transplant must continue to be viewed as an important option for all recipients on the waiting list.

### G&H According to the guideline, what is the optimal approach to immunosuppression after liver transplant?

**EV** Immunosuppression throughout the life of a posttransplant patient continues to need individualization to a certain extent. This is, therefore, presented with nuance in this guideline, which is very important. After transplant, most patients will be on a regimen that includes 3 classes of drugs, including corticosteroids, a calcineurin inhibitor, and an antimetabolite agent such as mycophenolate. The guideline provides important additional recommendations for specific circumstances, for example, the use of basiliximab in patients who need a delay in the initiation of their calcineurin inhibitor for a number of different reasons. Importantly, it also recommends against the use of other induction agents that have not been shown to be beneficial or may even be harmful. The guideline also addresses the idea of withdrawal of immunosuppression, as there have been a number of studies over the past decade looking at whether certain groups of highly selected patients can safely be withdrawn from all immunosuppression over time. This is an issue that is very important to patients and their families. The guideline

provides additional updates on these data as well as recommendations in this area. Thus, the guideline provides many important recommendations around individualizing immunosuppression, both early after the transplant as well as for the long-term maintenance regimen.

### G&H What are the key recommendations for the use of hepatitis C–viremic organs?

**EV** The key recommendations around the use of hepatitis C–viremic organs stress the fact that patients can be treated right away after transplant, as soon as they are clinically stable enough and certainly within the first 3 months after transplant. The guideline goes through the evidence for this recommendation and also cross-references the hepatitis C guidelines that are also available on this issue. The goal is to reduce the possibility of clinically important hepatitis C–related liver injury after transplant, and treating early with highly effective therapies is the best way to achieve that goal. This is an important update to the guideline as well.

### G&H What follow-up is recommended for patients transplanted for alcohol-associated liver disease or MASLD?

**EV** This guideline focuses on the need for multidisciplinary care in both of these scenarios and also for transplant practitioners to be educated about the different treatment modalities that are available for obesity and metabolic disease, as well as alcohol use disorder. Although not all transplant providers are going to be prescribing all of these medications, the guideline provides a framework through which multidisciplinary care can be utilized in order to provide the best care for these patients to prevent recurrent disease.

### G&H Can you discuss the expanding use of liver transplant for hepatocellular carcinoma, cholangiocarcinoma, and metastatic disease?

**EV** Hepatocellular carcinoma (HCC) has been an indication for liver transplant for some time, with fairly clear guidance around candidacy in terms of the extent of the tumor at the time of transplant. This guideline provides an updated review of the literature around outcomes for patients who are transplanted with HCC. There is also an emerging field of transplant oncology that includes not only HCC but also cholangiocarcinoma and even metastatic disease from outside the liver, such as neuroendocrine tumors and colorectal cancer, that will be discussed in more detail in the upcoming liver transplant evaluation guideline. Although the studies in these smaller cohorts do not provide enough evidence to strongly recommend the use of transplant in these scenarios, the upcoming guidelines provide a framework for future directions that are needed in order to better understand how to help patients in those circumstances.

### G&H What are the next steps in this area?

**EV** As mentioned, additional guidelines will be released in the next several months regarding the evaluation of adult transplant candidates as well as the treatment of complications outside of the liver graft in adult transplant recipients. I think the current guideline sets the stage for what additional work is needed in a lot of important areas, including best practices around utilization of machine perfusion devices and maybe even eventually specifics about which type of perfusion is preferred in specific scenarios. This is a very important area of ongoing active study. There are also ongoing studies on the best immunosuppression strategy for important subpopulations of transplant recipients. Finally, further investigation is needed on the best way to treat both metabolic disease and alcohol use disorder in transplant recipients.

***Disclosures***

*Dr Verna is the past chair of the guidelines committee. She has no relevant conflicts of interest to disclose.*

## Suggested Reading


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