

Prolonged Ischemic Times for Heart Transplantation: Impact of the 2018 Allocation Change

Jennie H. Kwon, MD¹; Lauren V. Huckaby, MD, MS²; Brandon Sloan, MD, MS¹; Nicolas H. Pope, MD¹; Lucas J. Witer, MD¹; Ryan J. Tedford, MD³; Brian A. Houston, MD³; Z.A. Hashmi¹; Marc R. Katz, MD¹; Arman Kilic, MD¹

1. Division of Cardiothoracic Surgery, Medical University of South Carolina, Charleston, SC
2. Department of Surgery, University of Pittsburgh Medical Center, Pittsburgh, PA
3. Division of Cardiology, Medical University of South Carolina, Charleston, SC



Background

Limited donor availability for heart transplantation (HT) has driven policy efforts to maximize waitlist survival and broaden geographic sharing of organs. In 2018, the United Network for Organ Sharing (UNOS) changed its heart allocation policy, which prioritized patients with higher urgency of HT. Early analyses after the policy change have demonstrated improved waitlist outcomes, including higher likelihood of HT and increased waitlist survival. However, they have also identified increased organ travel distances, increased cold ischemic times, and decreased early survival after HT. This study evaluated the effect of cold ischemic time on one-year mortality after HT in the context of allocation policy changes.

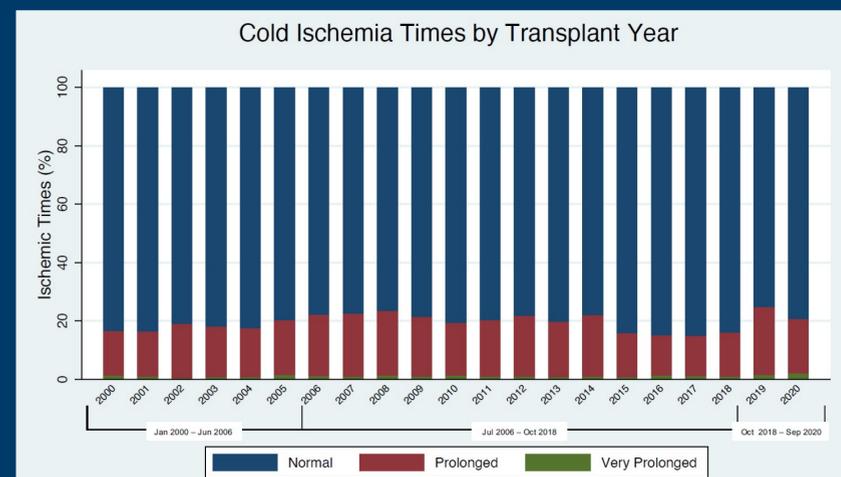
Hypothesis

Cold ischemic times increased after the 2018 policy change, and increased cold ischemic time is associated with decreased one-year survival.

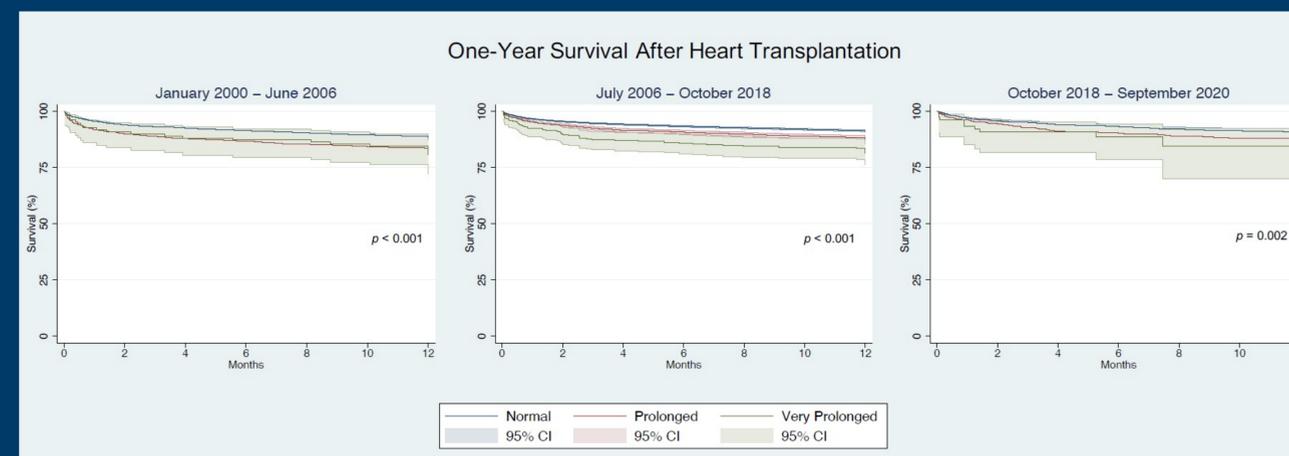
Methods

The UNOS registry was utilized to identify adults undergoing orthotopic heart transplantation from 2000-2020. Patients were stratified by the allocation policy era in which they underwent transplantation (2000-June 2006, July 2006-Oct 2018, Oct 2018-2020) and by cold ischemic time, defined as normal (<4), prolonged (4-6), and very prolonged (>6 hours). One-year mortality was compared using Kaplan-Meier survival analysis. Cox proportional hazards modeling was used to determine risk-adjusted hazards for ischemic time on one-year mortality.

Results



Results



Summary

The proportion of transplantations with prolonged and very prolonged ischemic times increased with each subsequent policy era. Ischemic time independently predicted one-year mortality in each era with a hazard ratio of 1.14 per hour ($p=0.006$) in the current era.

Conclusion

Prolonged ischemic times occur in a minority of cases but are increasing in frequency. The independent risk of prolonged ischemic time on one-year mortality persists despite advances in storage technology and should remain a consideration in donor-recipient matching.