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## Commentary: History is prologue: If we fail to learn from our past, we are doomed to repeat it

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As the new heart allocation anniversary approaches this fall, the 1-year analysis performed by Estep and colleagues<sup>1</sup> supports that the goals of the Organ Procurement and Transplantation Network (OPTN) were achieved: reduce waitlist mortality, reduce time to transplant, and broaden sharing of organs for the most urgent candidates.<sup>1</sup> Additionally post-transplant 6-month survival did not differ. While an early victory for the transplant community, time will tell if the celebration continues.

History is educational. Nativi and colleagues<sup>2</sup> compared the 2006 allocation policy with the former allocation system and found an increase in Status 1A transplants and ischemic times with decrease in Status 2 transplants and no effect on mortality, identical to Estep and colleagues.<sup>1</sup> Ten years later, OPTN reported congestion in status 1A and one half of adult heart transplant recipients having a durable ventricular assist device (VAD) before transplant.<sup>3</sup> VADs became embedded in our innate behavior.

The 2018 allocation was based on previous behaviors of a VAD-favorable environment because we knew patients could not survive months on temporary mechanical circulatory support (tMCS). Now patients with tMCS Status 2 are receiving nearly one half (45.7%) of the heart transplants and skipping VAD.1 How did we do in less than 2 years what took us a decade to do in the previous system: create a congested high status?

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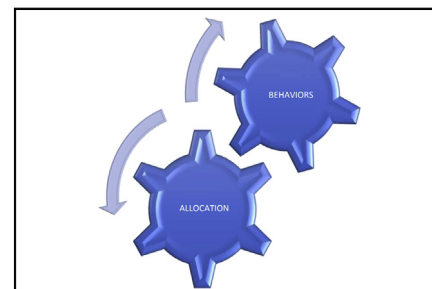
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Interdependence of behavior and allocation.

### CENTRAL MESSAGE

Can any allocation system work if we cannot control our behaviors in response to new rules?

The surge in Status 2 is most notably driven by the balloon pump.<sup>1,4,5</sup> While rising before 2018, use of balloon pumps increased 3-fold since the new allocation was implemented.<sup>6</sup> Furthermore, Status 2 faces another dilemma like 1A: increased exception requests. Between 2014 and 2015, 5340 of 5878 of all Status 1A/1B exception requests were for Status 1A. In comparison, 31% of all patients in Status 2 in the new allocation qualified by exception rather than established criteria.<sup>7</sup>

Compared with the other MCS bridging strategies, venoarterial extracorporeal membrane oxygenation was associated with the worst post-heart transplant survival.<sup>8</sup> Yet, given recent French CRISTAL registry<sup>9</sup> reporting favorable outcomes, can time, experience, growth of shock protocols, and early venting strategies improve our survival?

Additionally concerning, following the launch of the new allocation system, tMCS use in patients admitted with cardiogenic shock increased in US transplant centers but not in Canada or non-transplant centers in the United States.<sup>10</sup> This begs the question—are we increasing tMCS use because of worsening patient illness or to transplant faster?

The Heart Committee of OPTN has recognized the behavior changes and created a guidance document to address this overcrowding.<sup>7</sup> While Estep and colleagues<sup>1</sup> imply early victories of the new allocation system to prioritize order of critical illness, the insights into our own behaviors and transplant decision patterns are disturbing. As a community, we need to acknowledge our innate competing goals of transplant center volumes, outcomes, and donor use. We are at a crossroads—are we choosing a future where only patients in the intensive care unit will obtain transplants, or do we return to a previous strategy when VAD was the interim step? We must recognize that,

without moderating our behavior, we will break this young allocation system quickly.

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## Commentary: Flying too close to the sun

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There is a well-known Greek myth in which the architect Daedalus crafts a pair of wax and feather wings to escape the clutches of the cruel King of Crete. Daedalus wishes to free his son Icarus first, and launches him away after warning his only child to not fly too high, as the sun's rays would melt the waxy wings. Alas, Icarus, young and eager, falls to his death after disregarding his father's admonition.<sup>1</sup> While it is only an ancient story, it does still have relevance in the world of heart transplantation. Each year, more patients are listed for heart transplant whereas the number of donor hearts remains impertinently stagnant.<sup>2</sup> Like the old inventor wanting to



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### CENTRAL MESSAGE

We must continue to optimize organ allocation with ongoing evaluation and modification of existing systems. Undoubtedly, this will cause some unanticipated outcomes that require vigilance.

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save his son, we want to save our patients by transplanting as many donor hearts as we can to those who will benefit most.

In this issue of the *Journal*, Estep and colleagues<sup>3</sup> discuss the outcomes on heart transplantation after the implementation of new adult heart allocation guidelines in October of 2018. There were changes for the better: for example, more patients received heart transplants after implementation of the guidelines, there were no changes to mortality over 180 days for patients who were listed, and the available donor network