



June 15, 2015

Dear Transplant Surgeons and Cardiologists,

We are writing to inform you that we have received preliminary information suggesting a higher mortality rate for one subgroup of patients using SynCardia Systems, Inc.'s Total Artificial Heart (TAH-t) Companion 2 Driver System (C2 Driver System).

Interim analyses suggest that patients who required pre-implant circulatory rescue interventions (such as intra-aortic balloon pump or extracorporeal membrane oxygenation) had a higher mortality rate when using the C2 Driver System as compared to the Circulatory Support System (CSS) Console. Patients who did not require these pre-implant interventions had similar mortality rates with each driver.

The TAH-t was initially approved for use by the FDA on October 15, 2004, with the CSS Console as its initial driver system. In order to improve patient mobility, the FDA approved the smaller C2 Driver System on February 10, 2012. Both driver systems are approved for use only in the hospital setting.

### **ANALYSIS OF PROBLEM**

As a condition of approval of the C2 Driver System, SynCardia is required to conduct a postapproval study assessing postmarket performance. The study follows patients for three months after they receive the TAH-t with either driver system (the C2 Driver System or the CSS Console). At the end of three months, patients are reported as "died" or "survived." Patients are reported as "survived" if they lived for three months supported by the initial driver system, if they received a heart transplant within three months of TAH-t implant, or if they were transferred to another driver system within this time period.

In June 2014, SynCardia submitted its first interim postapproval study results for the C2 Driver System to the FDA. Those results indicated a higher mortality rate for one subgroup of patients initially supported by the C2 Driver System compared with patients who were initially supported by the CSS Console.

The FDA required additional information from SynCardia and data submitted by the company in September 2014 suggested that the relatively high mortality rate among patients supported by the C2 Driver System was confined to patients who required pre-implant circulatory rescue interventions. Specifically, among the 38 patients with pre-implant circulatory rescue interventions, mortality was 60% in C2 Driver System users, compared to 17% in CSS Console users. There was not a noteworthy difference in survival rates for patients who did not require pre-implant circulatory rescue interventions.

<i>Patients who received pre-implant circulatory rescue interventions, September 18, 2014 report</i>			
	<b>CSS Console</b>	<b>Companion 2</b>	<b>Total</b>
<b>Died</b>	<b>3 (17%)</b>	<b>12 (60%)</b>	<b>15</b>
<b>Survived</b>	<b>15 (83%)</b>	<b>8 (40%)</b>	<b>23</b>
<b>Total</b>	<b>18</b>	<b>20</b>	<b>38</b>
<i>Patients who did NOT receive pre-implant circulatory rescue interventions, September 18, 2014 report</i>			
	<b>CSS Console</b>	<b>Companion 2</b>	<b>Total</b>
<b>Died</b>	<b>20 (15%)</b>	<b>5 (16%)</b>	<b>25</b>
<b>Survived</b>	<b>113 (85%)</b>	<b>27 (84%)</b>	<b>140</b>
<b>Total</b>	<b>133</b>	<b>32</b>	<b>165</b>

To further assess the signal of increased mortality in the subgroup of patients who required pre-implant circulatory rescue interventions, the FDA conducted an analysis of data from patients implanted on or after July 9, 2012. This analysis also indicated a higher mortality rate for the subgroup of patients who had received pre-implant circulatory rescue interventions and who also were supported by the C2 Driver System.

## RECOMMENDATIONS

It is important to note that postapproval studies of the TAH-t and our investigation into this issue are ongoing. Although we are concerned about the higher mortality rates for one subgroup of patients in the interim postapproval study results, we also recognize that the C2 Driver System may be the best option for some patients. We recommend you consider this data about the higher mortality rates for one subgroup of patients when making your treatment decisions and device selection, especially in patients who require pre-implant circulatory rescue interventions.

It is important that you return all devices associated with, or suspected to be associated with adverse events, to the manufacturer to help them and us better understand the issue.

We highly encourage you to report any adverse events you experience or suspect with the SynCardia TAH-t C2 Driver System and CSS Console. Voluntary reports can be submitted through [MedWatch, the FDA Safety Information and Adverse Event Reporting program](#).<sup>1</sup> Device manufacturers and user facilities must comply with the applicable [Medical Device Reporting \(MDR\) regulations](#). Health care personnel employed by facilities that are subject to [FDA's user facility reporting requirements](#)<sup>2</sup> should follow the reporting procedures established by their facilities. Prompt reporting of adverse events can help the FDA identify and better understand the risks associated with medical devices.

<sup>1</sup> <http://www.fda.gov/Safety/MedWatch/HowToReport/default.htm>

<sup>2</sup> <http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/PostmarketRequirements/ReportingAdverseEvents/default.htm>

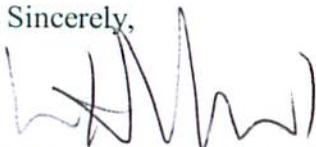
## FDA ACTIONS

The FDA is concerned about the higher mortality rates in one subgroup of patients in the interim postapproval study results. We will continue to review data from the postapproval study and other sources as they become available. We are also working with SynCardia and the Interagency Registry for Mechanically Assisted Circulatory Support (INTERMACS) to better understand the cause for the increased mortality rates in one subgroup of patients and its association with use of the C2 Driver System. We will provide updates, as needed, as additional information becomes available.

## CONTACT US

If you have questions about this communication, please contact the Division of Industry and Consumer Education (DICE) at [DICE@FDA.HHS.GOV](mailto:DICE@FDA.HHS.GOV), 800-638-2041 or 301-796-7100.

Sincerely,

A handwritten signature in black ink, appearing to read 'W. Maisel', written over a faint, illegible typed name.

William Maisel, MD, MPH  
Deputy Center Director for Science  
Center for Devices and Radiological Health  
U.S. Food and Drug Administration