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Peer Review File

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Reviewer A

The authors have prepared a timely, clear, and well-written review of temporary and durable mechanical circulatory support devices. The scope of the review is appropriate, covering all of the important devices currently used in practice. There are areas where additional details would contribute to the impact of this review, as I have noted below. Overall, the authors should be commended for their work.

Major Comments:

Comment 1: Tables: Table 1 is excellent. I recommend adding Syncardia TAH to the devices included and some additional information for all the devices (insertion locations; location of device in body; major adverse events associated with device; major contraindications to device; major prospective clinical trials including device).
Reply 1: We completely agree that this additional information should be added to the table.
Changes in text: We have added Syncardia TAH to the devices in Table 1. We have also modified our Table 1 with additional information on insertion location, location of the device in the body, major contraindications, major adverse events, and major prospective clinical trials relevant to these devices as a bridge-to-transplant (see "Table 1" file).

Comment 2: Line 99: Would be helpful to include estimated increase in cardiac output from IABP (as well as all pumps discussed) in the text.
Reply 2: We agree that this information would add to the text.
Changes in text: We have added cardiac output estimates for IABP (see Page 6 lines 113-114). Information on the increase in cardiac output for the Impella devices can be found on Page 7 line 145-146 (Impella 2.5/CP/5.0), Page 7 line 151 (Impella 5.5), and Page 9 line 193 (Impella RP). Cardiac output estimates for TandemHeart were added (see Page 8 lines 174-175). Information on the estimated increase in cardiac output for the Protek Duo can be found on Page 9 line 202. Information on the estimated

increase in cardiac output for the CentriMag can be found on Page 11 line 246.

Comment 3: Line 101: IABP-SHOCK II should not be called "recent."

Reply 3: We completely agree.

Changes in text: We have modified our text and removed the word “recently” (see Page 6 line 119).

Comment 4: Line 122-129: Recommend including details about pump mechanics, mechanism of action, pump ideal placement location.

Reply 4: We agree that more information on the pumps should be added.

Changes in text: We have modified our text as advised with additional information on the mechanics and mechanisms of action of the Impella and TandemHeart pumps, as well as ideal placement location of the pumps (see Page 7 lines 142-144 and Page 8 lines 174-177).

Comment 5: Line 131: Clarify which end of the Impella 5.5 device to which you are referring.

Reply 5: We agree that clarification is needed here and we apologize for this ambiguity.

Changes in text: We have modified our text to clarify which end of the Impella 5.5 device has been changed (see Page 7 line 152).

Comment 6: Line 135: Recommend specifying the hemodynamic parameters available through SmartAssist, including which are directly measured and which are calculated/estimated indirectly.

Reply 6: We agree that additional details on the hemodynamic parameters available through SmartAssist are important to include.

Changes in text: We have modified our text to include additional information on the hemodynamic parameters that are calculated and displayed through the SmartAssist device (see Page 7-8 lines 155-166).

Comment 7: Line 201: Need to clarify that CentriMag is the most common temporary surgically placed device. More durable VADs are placed per year than CentriMags.

Reply 7: This is a great point and we completely agree that clarification is needed here. We apologize for the ambiguity.

Changes in text: We have modified the sub-section heading (see Page 11 line 241) and the text to include the word "temporary" (see Page 11 line 244).

Comment 8: Durable LVAD Section: Need to add paragraph/section discussing recent withdrawal of HVADs from the market in the United States (June 2021) in setting of identified mortality risk secondary to pump stops.

Reply 8: We agree that this recent development is very important and should be added into the text.

Changes in text: We have modified our text to address the recent withdrawal of HVADs from the market, with information on why this occurred (see Page 13 lines 293-298).

Comment 9: Line 276-277: What was the number of total durable VAD implantations during this same period, as a comparison?

Reply 9: We agree that this comparison would be helpful.

Changes in text: We have modified our text as advised to include the total number of durable VAD implantations as a comparison for the number of TAH implantations during the same period (see Page 15 line 352-353).

Comment 10: Line 283: I recommend also adding 'time to correct end-organ injury secondary to cardiogenic shock' as a potential benefit of using temporary MCS as a bridge to durable MCS.

Reply 10: We agree that this is another potential benefit of temporary MCS and should be included.

Changes in text: We have modified our text as advised to include "time to correct end-organ injury secondary to cardiogenic shock" as a benefit of temporary MCS (see Page 15 line 359-360).

Comment 11: Line 288: It is worth discussing reference 51 in slightly more detail, including providing some hypotheses as to why this contemporary and provocative study showed that ECMO as bridge to durable VAD may provide worse outcomes than other forms of temporary MCS.

Reply 11: This is a great point and we agree that this requires further discussion.

Changes in text: We have modified our text as advised to include more details about this reference and hypotheses as to why ECMO bridge to durable VAD have worse outcomes (see Page 15-16 lines 368-373).

Comment 12: Line 315/Reference 34: How have the absolute numbers of LVAD implantations changed over this time period?

Reply 12: We agree that this would add to the text.

Changes in text: We have modified our text as advised to include information on the absolute numbers of LVAD implantations (see Page 17 lines 397-402).

Comment 13: Line 336-342: How did the absolute number of LVAD implantations change during this period?

Reply 13: We agree that this is important to include.

Changes in text: We have modified our text as advised to include the number of absolute LVAD implantations during this time period (see Page 19 lines 455-456).

Small Suggestions:

Comment 14: Line 56: Remove "a combination of" for clarity

Reply 14: Agreed.

Changes in text: We have modified our text to remove “a combination of” (see Page 4 line 65).

Reviewer B

With great interest, I have read the article entitled "Bridge to transplantation from mechanical circulatory support: a narrative review" by Zhou and colleagues.

Comment 15: Although the manuscript is well written, I feel that the lineup of all MCS devices is somehow distracting from what is really interesting, i.e. the change in treatment policies elicitied by the change of the UNOS allocation tiers. While the first part of the paper (description of different MCS devices) is somehow reproducing abundant literature on this topic, the second and most interesting part (changed allocation and practice) could be more detailed summarizing the published results. Maybe the authors could highlight the second part even more and substantially shorten the first. Maybe they could delineate what has actually changed in practice. Yes, more transient MCS devices, particularly th iABP, are used for bridge to transplantation, but has the indication for the insertion of a iABP changed, if so? This

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is indeed provocative.

As a minor point, the novel continuous flow centrifugal pump LVADs ARE not designed and approved for RV support, however, there are pulsatile paracorporeal devices available. Maybe the authors want to include this in the text page 13.

In summary, I would suggest major revision of the paper with more detailed information on the practical clinical changes upon renewal of the allocation system.

Reply 15: We agree that the second part detailing changes in practice following the allocation change is very interesting, and we agree that it would particularly be interesting to see whether indications for the insertion of IABP have changed. We have decided to include the first part of the paper (description of MCS devices) in order to provide the readership with context on the devices and highlighting information on recent (last few years) updates in utilization of these devices as bridge-to-transplant strategies. As advised, we have added to the second part of the paper by including additional details on published results that have investigated changes following the allocation policy revision. At this time, however, data on practical clinical changes following the 2018 allocation policy change are still limited, and to our knowledge, we have included all existing trends on the changes in MCS practice following the policy change. We completely agree that it is provocative whether indications for insertion of IABPs have changed. We have included a discussion on this point through our citations of the Jawitz et al., Parker et al., and Varshney et al., and we look forward to additional data on clinical changes that will become available as further research is done. We have also included additional information on the pulsatile paracorporeal devices available as RV support.

Changes in text: We have modified our text as advised to include additional information on pulsatile paracorporeal devices (see Pages 14 lines 330-333). We have also modified our text as advised to expand on the second part of the paper and include additional details on studies investigating changes in practice following the UNOS allocation policy revision (see Page 18 lines 429-441, Pages 18-19 lines 446-451, Page 19 lines 456-458, Page 19 lines 461-464, and Page 20 lines 483-485).

Reviewer C

Comment 16: Prof. Kilic and coll. have reported a narrative review on the status of MCS as bridge to transplant. I enjoyed reading this paper, which covers the topic extensively and give a glimpse on the trends following the new UNOS allocation system. I congratulate the authors and have no further comments

Reply 16: We thank you for your feedback.

Changes in text: N/A