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Herma Heart Institute

The Impact of Virtual Reality Learning on Transition Education in Adolescents with Congenital Heart Disease

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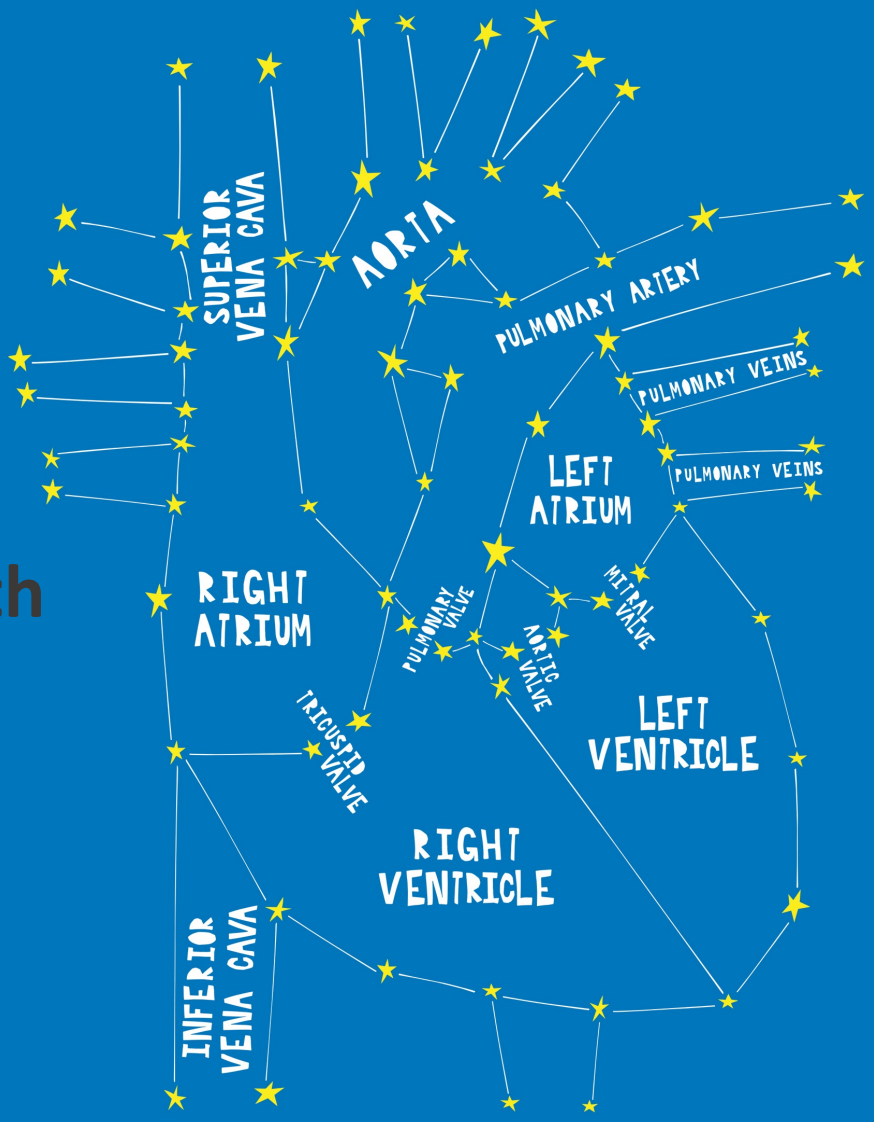
Collaboration: Medical College of Wisconsin, Stanford University



BACKGROUND

- In 2016, Herma Heart Institute (HHI) at Children's Wisconsin developed a transition program to provide education to adolescents with congenital heart disease (CHD) prior to establishing care with an ACHD team.

- In 2019, HHI partnered with Stanford Virtual Heart (SVH), a virtual reality (VR) experience supported by Stanford Children's Hospital, to allow patients to learn about their CHD. SVH provides an immersive and interactive learning environment, allowing users to manipulate the heart, understand defects, and visualize surgical repair.

- We hypothesized that SVH is enjoyable and allows patients to better understand their CHD.

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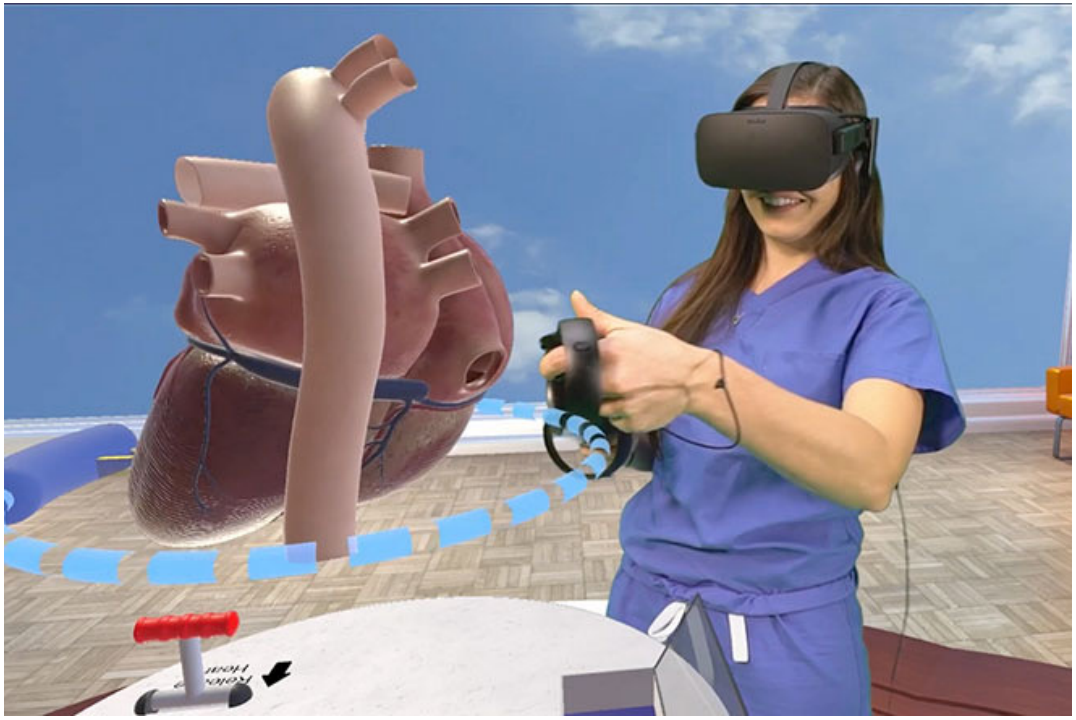
BACKGROUND



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METHODS

- A single center pilot study utilizing SVH was completed.
- A pre-transition assessment readiness questionnaire and an 8-question post VR experience survey was obtained, with participants rating various aspects of the experience on a Likert scale of 1-5.
- Eligible patients had lesions specific to those available to the SVH, which included: *pulmonary stenosis, Tetralogy of Fallot, ASD, VSD, coarctation of the aorta, aortic stenosis, HLHS, and PDA.*
- Patient's received letters describing the opportunity and interested patients were provided the VR experience at their initial transition visit.

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METHODS

8 question Post-VR Experience Survey

Questions for Evaluation of the SVH use during ACHD Transition

- Did you work with the virtual heart today?
  - Yes
  - No, I chose not to (Reason:_____)
  - It was not offered today
- To be ranked on a 1-5 Likert scale:
  - I found the virtual heart helped me understand my congenital heart lesion
  - I found the virtual heart helped me understand my heart surgeries
  - I was excited to use the virtual heart today
  - I enjoyed being able to examine the virtual heart from the outside and move individual parts of the heart
  - I enjoyed being inside of the virtual heart
  - I learned something new today when using the virtual heart
  - I learned something important today when using the virtual heart
  - The virtual heart was a useful use of my time today
- I think that the time spent with the virtual heart was:
  - Much too Long
  - A little too long
  - Just right
  - A little too short
  - Much too short
- I wish I had been able to use the virtual heart:
  - Before today (How long ago_____)
  - Now is the right time to first see the virtual heart
  - I would have rather first used the virtual heart sometime in the future
  - I would rather have not used the virtual heart
- Were there any technical problems with the virtual heart today?
  - Yes (any specifics?_____)
  - No
- Did you have any physical problems with the virtual heart (nausea, dizziness, etc.)
  - Yes (Specify:_____)
  - No

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RESULTS

- Data obtained between 6/2019-3/2020.
- **22 patients** (59% male), ages 16-19, participated.
- Total cardiac lesions: PS(2), TOF(1), ASD(1), VSD(3), Coarctation(4), AS(6), HLHS(4), and PDA(1).

- **Pre-transition assessments** showed that **86%** of patients felt they knew/could explain their cardiac specific lesion with **42%** feeling that they knew/could explain their cardiac specific surgical intervention.

- **Post VR experience Likert scales** showed average scores of **4.7** for finding VR helped with understanding their heart lesion, **4.6** for finding VR helped with understanding their heart surgery, and **4.6** for enjoying the VR heart simulation.

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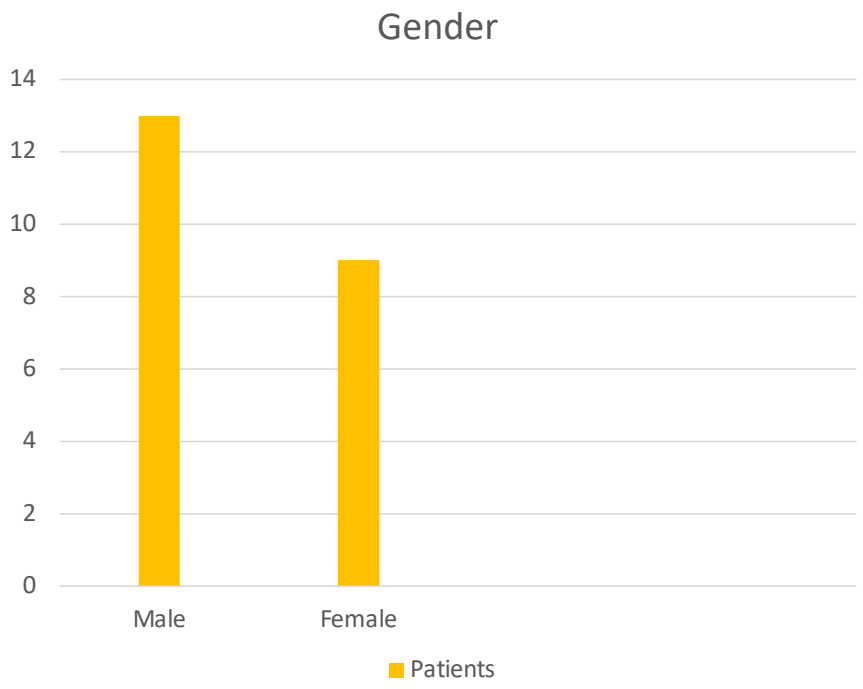
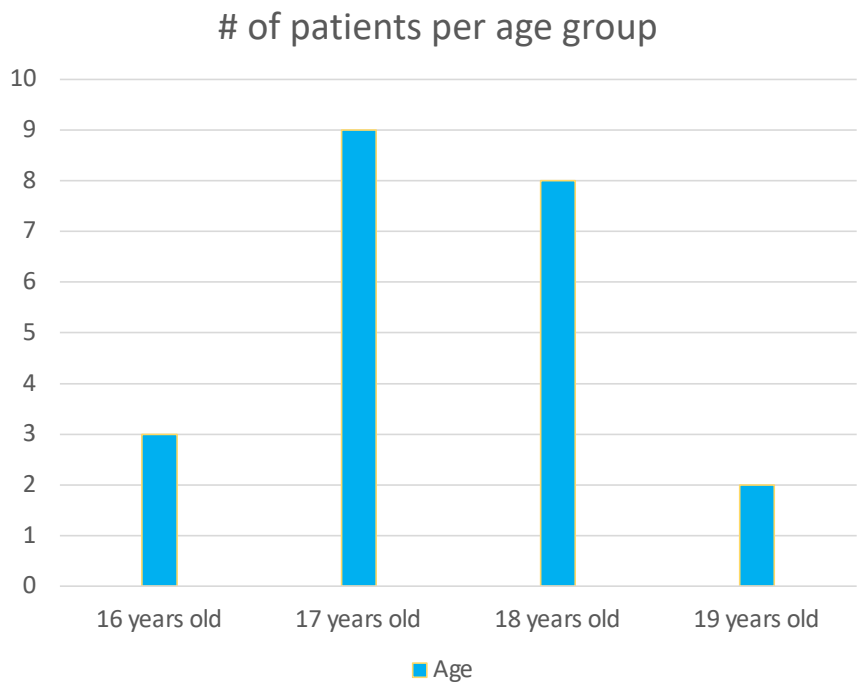
RESULTS





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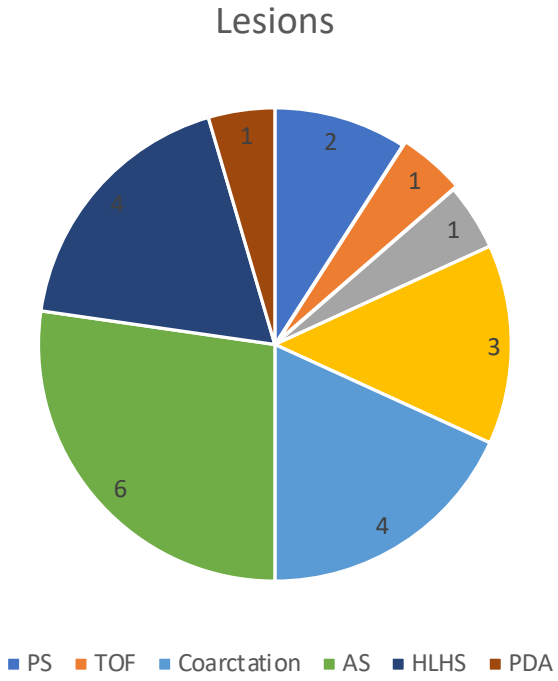

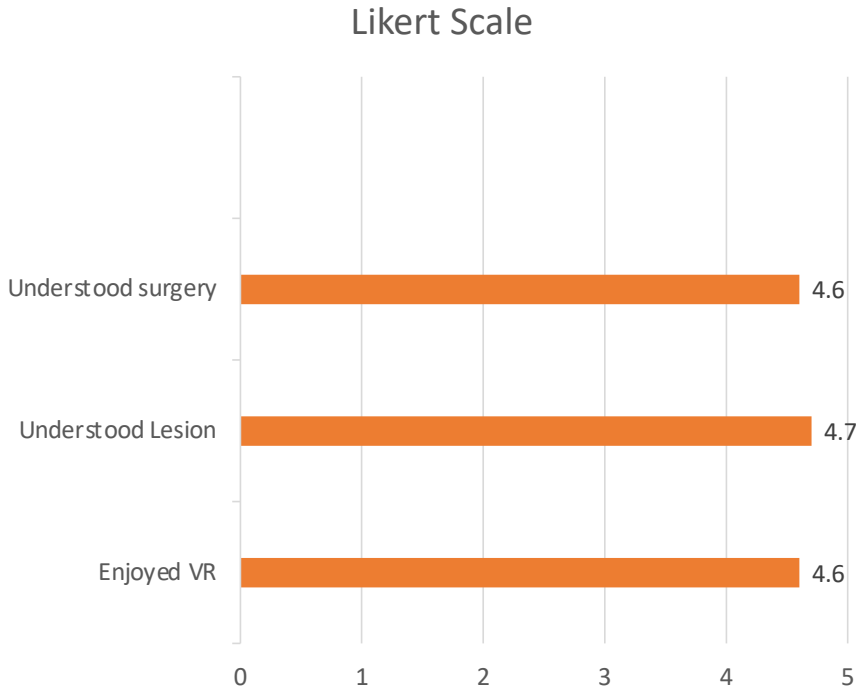

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CONCLUSIONS

- This study demonstrates adolescents enjoyed the SVH VR experience, finding it helpful with learning about their CHD. SVH implementation in clinic can be feasible, easily implemented, and shows promise as a reliable tool for transition education.

- **FUTURE STUDY GOALS**:
  1. Focus on information retention, true impact on acquisition of knowledge, and long-term behavioral effects.

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