



Heart Valve Voice US Stakeholder Advisory Board

Recommendations for Comparative Effectiveness Research on Heart Valve Disease

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Heart Valve Voice US would like to thank PCORI for its support of this important work.

Project Lead: Marilyn Serafini, Executive Director, Heart Valve Voice US

Patient Lead: Susan Strong, Board President, Heart Valve Voice US

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Overview

As part of its Patient-Centered Outcomes Research Institute (PCORI)–funded project, *Heart Valve Disease—Improving Patient and Caregiver Experiences*, Heart Valve Voice U.S. (HVV) convened a Stakeholder Advisory Board to develop a list of research themes and specific comparative effectiveness research questions on heart valve disease (HVD). The Board, which consisted of 18 patients, care partners, and health care providers, met by teleconference on July 17 and July 18, 2018, for initial brainstorming. In early August, HVV sent a survey to its 1,100 members to gain additional feedback. HVV also circulated the draft report to the Board to solicit participant feedback. The Board met in a third teleconference on August 29 to finalize its recommendations after considering the responses from the public survey. This report outlines the themes and research questions that HVV developed through this process. A summary of the survey results and a list of participating Board members are provided in Appendix A and B, respectively.

Top Concerns for Patients with Heart Valve Disease

Before brainstorming research themes and questions, Board members discussed their top concerns for patients with HVD. These included the need for accurate and increased diagnosis, timely treatment after diagnosis, patient education before and after treatment, care for psychological aspects of diagnosis and recovery, and ways to mitigate disparities in access to care. The discussion reflected the major prevalence of valvular heart disease among not only the elderly, but also subgroups with unique concerns, including younger patients with congenital defects, cancer survivors, and patients requiring multiple valve procedures. Finally, Board members expressed concern about access to newer, less-invasive procedures for heart valve replacement, such as transcatheter aortic valve replacement (TAVR).

Research Themes

The Board identified four broad research themes: Underdiagnosis, Disparities in Treatment, Treatment Options, and Post-Surgery and Recovery. Its specific concerns in each of these areas are listed below.

Underdiagnosis

- Some patients are at higher risk for valvular heart disease because of age, cancer treatments, rheumatic fever, congenital defects, and other factors. Others are asymptomatic, and many mistakenly associate their symptoms with unrelated factors, such as age, weight, lack of physical conditioning, or other conditions with similar symptoms. HVD can also be confused with the stresses of everyday life, such as feeling tired because of a stressful job, parenting, or lack of sleep. An irregular heartbeat can also be confused with an excess of caffeine or other causes. As a result, patients may shrug off symptoms. A 2016 study found that 6 in 10 heart valve patients did not have or recognize their symptoms, and they were only diagnosed after a regular checkup or unrelated doctor visit.¹ Failing to

¹ Belden Russonello Strategists on behalf of the Alliance for Aging Research. Report of Findings from Opinion Research Among Heart Valve Disease Patients. June 2016. Available at

diagnose valvular heart disease can be deadly. For patients with severe symptomatic aortic stenosis (sSAS) who do not undergo valve replacement, survival rates are as low as 50 percent 2 years after symptoms begin and 20 percent at 5 years.² Half of people with sSAS do not report symptoms at the time of diagnosis. In one study, two-thirds of those patients ultimately developed symptoms and, within 5 years, 75 percent either died or underwent aortic valve replacement.³ There is currently no standard best practice guideline or inexpensive screening tool for HVD for the general population, such as a verbal questionnaire, and more awareness of these statistics is needed for patients and for physicians across the health care spectrum, from primary care clinicians to specialists.

- A proper medical history and physical examination can detect many types of HVD, but some primary care providers do not reliably differentiate between insignificant murmurs and clinical valve disease, and many patients are asymptomatic. Patients and their primary care providers need education about heart murmurs and the symptoms of HVD. Patients may not report symptoms to their doctor if they are unaware that they may be heart related. It is often difficult to distinguish HVD symptoms from other conditions.
- American Heart Association (AHA)/American College of Cardiology (ACC) guidelines provide physicians with information about when to refer patients to a specialist; however, three out of five recommendations relating to diagnosis and follow-up are based only on consensus opinion of experts and case studies. The guideline writing panel did not include any primary care providers.⁴
- Despite some recent progress, health care delivery systems in the United States often do not encourage integrated care teams that facilitate coordination, collaboration, and communication among primary care physicians and cardiologists.
- Some people are at high risk for HVD, and guidelines exist for screening those patients. Yet many cases remain undiagnosed because patients and medical providers are unaware of the higher risk and the guidelines. For example, cancer survivors who receive chest radiation should be informed of their elevated risk for HVD and understand best practices for post-cancer surveillance. Primary care providers should consistently identify higher-risk patients and follow screening guidelines for higher-risk patients; more collaboration between oncology and cardiology is needed.

Disparities in Treatment

- Geographic location, financial status, gender, race and ethnicity, and type of insurance (if any) affect access to hospitals, providers, treatments, specialists, rehabilitation programs, physical and occupational therapists, and behavioral health resources. For example,

https://www.agingresearch.org/app/uploads/2017/12/Research20Opinion20Survey20among20Heart20Valve20Patients_Final.pdf.

² Alliance for Aging Research. The Silver Book on Valve Disease: Chronic Disease and Medical Innovation in an Aging Nation. 2018. Available at <https://www.agingresearch.org/app/uploads/2018/06/Silver-Book-Valve-DiseaseVOLUME-Final.pdf>.

³ Genereux P, Stone GW, et al. Natural History, Diagnostic Approaches, and Therapeutic Strategies for Patients with Asymptomatic Severe Aortic Stenosis. *J Am Coll Cardiol* 2016;67(19):2263-88.

⁴ Nishimura RA, Otto CM, et al. AHA/ACC Guideline for the Management of Patients with Valvular Heart Disease. *Circulation* 2014;129:e21-643. Available at <https://www.ahajournals.org/doi/10.1161/CIR.0000000000000031>.

differences in health risk factors affecting African Americans are not always considered. African Americans experience risk factors for HVD at earlier ages, and they develop heart failure before age 50 at 20 times the rate of Caucasians.⁵

- Not all patients believe that they receive adequate information about their HVD, treatment options, surveillance options, surgery outcomes, rehabilitation expectations, and quality of life factors. Partnership and communication between a patient and his or her physician are important.
- Some patients report receiving only one treatment option and later discover additional options for which they qualify but were not offered. Although not all patients have a high level of health literacy, patients often benefit from asking questions. It is challenging to learn about the latest medical technology and to know how to conduct research about heart valve surgeons available in their insurance network and geographic proximity, as well as those surgeons' experience with repair and replacement procedures.

Treatment Options

- The “watch and wait” or “active monitoring” approach can cause confusion and anxiety for patients. Waiting for symptoms to worsen without fully understanding the risk involved or the reason for delaying treatment can be unsettling for patients. Adherence to active monitoring treatment plans is a challenge and concern. Missed follow-up appointments can alter the choice to repair or replace a heart valve. Current professional guidelines mention the option of watchful waiting until symptoms emerge for aortic valve replacement (AVR) in asymptomatic patients with severe aortic stenosis. Many patients with aortic stenosis are evaluated electively on an outpatient basis so that waiting time between recommendation for AVR and the actual procedure may place patients at risk for progression of HVD.
- Patients are often confused and anxious about the recommended timing for interventions, even when the proposed timing is based on evidence. Different physicians sometimes recommend different timing options for the same procedure.
- Patients may prefer treatments based on factors that are not always considered when physicians make recommendations. Factors of importance to patients include their current and post-procedure prognosis for length and quality of life (including long-term quality), the pain involved in undergoing the treatment, the overall patient experience, the recovery, time off from work prior to and following treatment, the longevity and durability of treatment, and the individual patient's values.
- Less-invasive procedures such as TAVR, which are currently approved for many people with HVD, take more than 10 years to gain regulatory approval. Although advances in medicine are slow to reach patients, caution can prevent unintended consequences. Clinical trials are options for certain patients, but not all physicians tell patients about relevant opportunities. Patients should be empowered to decide whether the benefits of participating in a clinical trial outweigh the risks.

⁵ Bibbons-Domingo K, Pletcher MJ, Lin F, et al. Racial Differences in Incident Heart Failure among Young Adults. *N Engl J Med* 2009;360:1179-90.

- Patients and clinicians need access to effective shared decision-making tools that clearly explain risks and benefits in both graphic and written form, as well as video materials about the anatomy of the heart, valves, how the surgery will be performed, and what the scars will look like. While we are aware of certain decision aids for TAVR, including one developed with PCORI funding, we are also aware that these tools and others are early in their development and therefore do not yet meet the National Quality Forum’s standards and criteria. Resources are needed to update the tool and further test it in real-world settings.

Post-Surgery and Recovery

- Mental and emotional health is an under-discussed and undertreated aspect of HVD and recovery. Patients fear living with a disability, receiving treatment in a rehabilitation facility, needing repeated treatments, taking blood thinners, engaging in heart-rigorous activity, and coping with the impact of their disease.
- Patients need more pre- and post-procedure education to guide successful long-term, whole-person recovery. They need support to address the possible mental health aspects of heart valve replacement or repair.

Research Questions

Within each research theme, the Stakeholder Advisory Board formulated comparative effectiveness research (CER) questions. For each research question, the group sought to define the target population (“people”), the interventions for comparison (“options”), and the results that would facilitate actionable decisions (“outcomes”). **The Board prioritized the top five CER questions, which are marked with an asterisk (*).**

Underdiagnosis

The desired outcomes for underdiagnosis are to increase overall diagnosis rates for people with HVD, increase diagnosis rates for high-risk and older patients, and increase awareness of HVD symptoms among patients and providers. Relevant research questions include the following:

Can primary care providers be better trained to detect HVD with a stethoscope, or could they perform additional types of screening? What are the best ways for primary care practitioners to educate patients in a way that they appreciate the diagnosis and meaning of their disease and understand how to proceed? Would HVD educational sessions improve detection (e.g., testing with sample heart sounds)? Can new types of screening tools be developed? How can patients be encouraged to seek second opinions? Do patients who seek second opinions have better outcomes than those who do not? Should echocardiograms be performed on every patient, only those at higher risk, or those of a certain age? Are there potential harms in over diagnosing HVD or over imaging? What is the patient’s role in shared decision making and what comparisons can be made between patients who use a shared decision-making tool and those who do not? How can patients learn to ask pertinent treatment questions? Can they then recontact a provider to ask questions that arise after the appointment ends? How should patients in various age groups (e.g., congenital HVD vs. elderly patients) approach each of these areas?

The Board identified three specific research questions related to underdiagnosis.

1. *Do primary care providers (physicians, physician assistants, and advance practice nurses) who receive specific training to recognize pathologic heart murmurs more accurately diagnose HVD and refer patients for additional diagnostics compared to providers who do not receive such training?**

People: primary care providers (physicians, physician assistance, advance practice nurses)

Options: supplemental HVD diagnostic training (e.g., murmur sound recognition) vs. no additional training with the option to compare types of training programs

Outcomes: HVD diagnosis rates, across and within cohorts

Although this research question compares specific continuing education training to the status quo, Board members believed that this was an important comparison to make. Several variations of training could also be compared. Training might involve sound recognition training through podcasts or digital apps, and various approaches of sound recognition training could be compared. Sound recognition training could also be compared to written materials that describe symptoms of valvular heart disease. Apps already exist for detecting the sound of murmurs that should be referred for diagnosis.

2. *What methods of patient education raise awareness of HVD, risks, and symptoms?**

People: HVD patients

Options: HVD awareness education (e.g., posters in primary care and oncology offices, public service announcements, awareness campaigns in health and wellness apps, personal stories of survivorship, community health fairs, patient portals, and health insurance symptom checkers)

Outcomes: patient awareness level; reduced disparities in diagnosis rates in different racial, ethnic, geographic, and gender groups

3. *Do diagnosis rates for HVD increase when primary care providers are prompted to screen for HVD during annual physical examinations?*

People: patients aged 65 and older, patients of color or those in specific ethnic groups, female patients, patients in designated geographic areas (screening questions), and patients aged 75+ (echocardiogram)

Options: prompts to screen during annual physical examinations vs. no screening prompts. Screening prompts would come through existing electronic tools that most clinicians already use.

Outcomes: diagnosis rates from physical examinations with or without prompts, intervention/treatment rates

Disparities in Treatment

The desired outcome is to reduce demographic and geographic disparities in access to care, including disparities related to race and gender. Relevant research questions include the following:

Could telemedicine, telehealth, telemonitoring, or technologies provide access to care for HVD patients who live in rural areas or who face transportation challenges? How can underserved populations (e.g., minorities, women, rural inhabitants) gain access to high-quality diagnosis and treatment? Do cultural hurdles prevent underserved populations from seeking available care and maintaining compliance? If so, what is the root cause of these cultural hurdles? What outreach and education methods are most effective for underserved populations? How can providers examine their personal views and biases that may influence their interactions with patients of diverse cultures and genders? Would cultural competence training for providers increase patient retention and adherence? How could communicating patient stories affect change in this area? Does screening delivered in a community setting reduce disparities in HVD diagnosis rates between African American and white patients compared to screening during annual primary care examinations?

The Board identified one specific research question related to disparities in treatment. It also noted that disparities in diagnosis and treatment should be addressed through inclusion in other, broader research questions.

1. *What are the best methods for ensuring that African American and Hispanic patients continue with active monitoring protocols?*

People: African American and Hispanic patients diagnosed with HVD, before surgery

Options:

- counseling and educating by patient and caregiver peers vs. counseling and educating by clinicians
- compare patient follow-up reminder methods between mobile app, text message, email, phone call, etc.

Outcomes: patient retention rates, patient and caregiver understanding of the importance of vigilance in follow-up monitoring

The Board recommended conducting a pilot study to determine potential methods for active monitoring most suitable for comparison before undertaking such research.

Treatment Options

The desired outcomes for treatment options are to identify factors important to patients making treatment decisions and to improve outcomes and reduce noncompliance by increasing awareness of watchful waiting/active monitoring. Relevant research questions include the following:

How can HVD patients learn to research and choose a cardiologist or surgeon? How do patients know which questions to ask and muster the courage to ask them? When help is needed, how can patients be taught to play an active role in the treatment decision process? How can we increase transparency between patients and physicians, including outlining the responsibilities and expectations of each? What are best practices for ensuring the scheduling follow-up visits, sending automated overdue appointment reminders, and ensuring compliance with active monitoring protocols?

The Board identified two specific research questions related to treatment options.

1. *What shared decision-making tools best capture patient preferences and values in deciding among heart valve treatment options?**

People: HVD patients considering treatment

Options: identify and compare decision-making tools for assessing how various treatments affect overall quality of life, mobility, and independence; avoiding rehospitalization; the ability of the patient to go home versus rehab after treatment; length of hospital stay; current and post-procedure prognosis for quantity and quality of life (including long-term quality); the pain involved in undergoing the treatment; the overall patient experience, including recovery, time off from work before and after treatment, the longevity and durability of treatment, the individual patient's values, and ability to promote dialog between patients and their treating physicians

Outcomes: patient/physician understanding of important non-medical factors in choosing a treatment; patient engagement/empowerment in being a part of the decision, patient satisfaction with care

Before undertaking such research, the Board recommended studying the adoption of shared decision-making tools in clinical practice.

2. *After diagnosis, when is the appropriate time for asymptomatic HVD patients to undergo treatment?**

People: asymptomatic HVD patients who have been diagnosed but who have not undergone treatment (e.g., those with moderate aortic stenosis)

Options: compare outcomes for patients who undergo treatment at different intervals or different stages of disease progression (e.g., 1 year, 3 years, 5 years, and 7 years or different cutoff levels of diagnostic tests)

Outcomes: heart function, death rate, quality of life; level of anxiety and depression

Although the Board unanimously agreed that it is important to study the appropriate timing for intervention of asymptomatic HVD, they acknowledged that interventional clinical studies (rather than comparative effectiveness studies) may be needed.

Post-Surgery and Recovery

During the recovery phase after surgery, the desired outcomes are to improve awareness and treatment of patients experiencing depression and anxiety and to ensure the quickest and most complete recovery of patients. Relevant research questions include the following:

Do HVD patients who receive adequate mental health care during recovery achieve better outcomes and fewer complications than those who do not? How does family and social support affect recovery? Are HVD patients screened for a history of depression prior to treatment? Should survivorship care for HVD patients be modeled after what has become available to cancer patients? Are HVD patients provided with age-appropriate recovery support and properly referred to support groups and support systems? Do model cardiac rehabilitation

programs screen for and provide or refer for mental health support and care? What roles do surgical liaisons, heart valve disease survivors, or advocates/ambassadors play in providing post-treatment information to patients?

The Board identified two specific research questions related to post-surgery and recovery.

1. *Do HVD patients have better outcomes when behavioral care is integrated with physical rehabilitation following treatment?**

People: HVD patients recovering from surgery or intervention (subgroup for underserved rural patients and minority patients)

Options: physical rehabilitation vs. physical rehabilitation with integrated behavioral health care (e.g., behavioral health screening during heart valve care encounter and incorporated behavioral health treatments such as support groups and referral to behavioral health resources)

Outcomes: validated mental health instruments, self-reports, and clinical outcomes

For the options in this question, the comparators could also be the various forms of integrated physical and behavioral rehabilitation, such as screening, incorporated behavioral health treatments, and referrals to behavioral health resources.

2. *Do HVD patients have better compliance with post-treatment care and better behavioral health outcomes when they have contact with in-person support programs before or after treatment?*

People: HVD patients before or after treatment

Options: (1) no peer support programs vs. a peer support program; (2) pre-treatment support vs. no pre-treatment support; (3) peer support program before and after treatment vs. only post-treatment peer support. Another option would be to compare peer support programs vs. referrals for clinical support.

Outcomes: validated mental health instruments, self-reports, and clinical outcomes

Appendix A

Summary of Stakeholder Survey Results

HVV surveyed 1,100 HVD patients, caregivers, and other stakeholders about their priorities and concerns for diagnosis, treatment, and post-treatment. The following summary is based on responses from 79 patients and caregivers (71 respondents self-identified as patients, 3 self-identified as caregivers, and 5 self-identified as other).

Respondents shared the priorities outlined by the Stakeholder Advisory Board. When asked whether they agreed with the priorities outlined by the Board, 83 percent said they strongly agree or somewhat agree with the priorities. One percent said they strongly disagree, and 16 percent said they did not read the Board's draft summary.

Respondents shared the concerns of the Stakeholder Advisory Board. HVV asked respondents to rate specific areas of potential concern, scoring each on a scale of 1 to 5 based on importance to the individual (5=very important to 1=not very important). HVV listed the following potential concerns that were identified by the Advisory Board.

- Too many people are not diagnosed
- Access to treatment differs because of race, gender, income, or where people live
- Patients sometimes do not understand the monitoring process while waiting for the right time for treatment
- Patients do not have enough support during recovery from heart valve surgery
- Good systems are not in place for patients to understand and receive treatment for depression and anxiety that can be associated with heart valve treatment

The weighted average score for each potential concern was a 4 or a 5 in importance, indicating that the respondents attributed a high level of importance to each item. Patients attributed the highest importance to the monitoring process while waiting for the right time for treatment.

Additional Research Priorities

Diagnosis priorities. Patients placed high importance on making sure that physicians can recognize heart murmurs that require referral and determining the best ways to inform the public about HVD.

Patients wrote in seven of their own priorities for research around diagnosis, in the following areas:

Watchful waiting: Lack of communication with patient

“Don't tell the patient with the murmur that it is no big deal and then not repeat the echo for 6 years, only to find it very calcified and extreme stenosis.”

“Putting off treatment before it becomes a very unhealthy situation.”

Patients feeling like they are not being taken seriously

“When the patient says they can’t breathe and can’t do anything. Believe them.”

Communication between clinician and patients

“Patients need education about the process, after-care needs, recommended surgery, and valve types.”

Questions about heart valve disease. Respondents listed 63 questions about HVD in the following areas, with multiple questions and concerns indicating that patients believe that they do not know the right time to replace a valve, and that their physicians are not educating them about the process and treatments. Some say their doctors are waiting too long to replace valves and they are not receiving information necessary to be a part of the decision-making process. Below is a sampling of the questions that respondents asked:

- Why and when are blood thinners needed?
- What does “repair” mean?
- Watchful waiting (multiple questions about timing and waiting too long): How long does asymptomatic disease take to progress? When is the right time for heart valve replacement? How can you tell? Replacement is occurring later than it should because doctors are not taking symptoms seriously. Wouldn’t it be better to replace the valve before it is extremely stenotic regardless of symptoms?
- No help for anxiety.
- With a second valve replacement, what happens with the first and the space?
- What is the survival rate after valve replacement?
- Can the HVD return after replacement?
- Why do clinicians sugar coat diagnoses?
- Will medication keep mitral valve regurgitation from worsening?
- What is life expectancy after valve replacement?
- Is Aortic Stenosis congenital?
- Is anyone working on a cure for calcification, so that replacement can be avoided? (multiple questions)
- What can be done to keep HVD from progressing?
- What can I do to keep my new heart valve healthy? (nutrition, exercise, etc.) (multiple questions)
- How long do the replacement valves last?

Appendix B

Stakeholder Advisory Board Members

Seun Alli, MD, interventional cardiologist

David Andelman, patient

Jennifer DoCampo, patient coordinator

Gina Fiorentino, patient

Elaine Hartt, care partner

Rich Hartt, patient

Rob Johnston, patient

Thomas MacGillivray, MD, thoracic surgeon

Patty Peterson, patient

Malea Potter, patient

Christine Rehash, patient

Mark Ridder, patient

Ray Rivera, patient

Margot Savoy, MD, family physician

Marty Seffens, care partner

Brunie Seffens, patient

Marilyn Serafini, care partner

Brenda Shipley, care partner

Susan Strong, patient

Teresa Wright-Johnson, patient