American Heart Association
Strategically Focused Research Network (SFRN)
On Earlier Detection and Delaying Progression of Valvular Heart Disease

Request for Proposals

Key Dates

RFP Posted:	Thursday, September 4, 2025
Required Pre-proposal Deadline:	Wednesday, October 29, 2025, by 4pm ET / 3pm CT
Proposal Deadline:	Wednesday, January 21, 2026, by 4pm ET / 3pm CT
Heart Association 2-Phase Peer Review:	February and March 2026
Notification of Awards:	March 2026
Award Start Date:	April 1, 2026

The American Heart Association announces this Request for Proposals (RFP) for the Strategically Focused Research Network on Valvular Heart Disease.

APPLICANT REQUIREMENTS

American Heart Association Professional Membership is required to submit a pre-proposal. Every individual applying as a Center Director (CD) or a Project Principal Investigator (PI) in ProposalCentral must join or renew online or by phone at 1-888-242-2453 or 972-349-5803. Membership processing may take up to five days; **do not wait until the pre-proposal deadline to renew or join.**

Required Pre-Proposal
Each Center Director is required to submit a pre-proposal electronically via ProposalCentral.

The Association believes that including individuals of all backgrounds is an essential component to driving its mission. We strongly encourage applications by individuals who have faced special challenges or obstacles to their careers and those who have experienced varied and non-traditional career trajectories.

The Association highly encourages applications from institutions that are AREA eligible (as defined by the NIH) or to partner with an AREA-eligible institution or another non-research-intensive institution.

BACKGROUND

Valvular Heart Disease

Valvular heart disease (VHD) is a common cardiovascular condition in which one or more heart valves are stenotic or regurgitant.[1] If left untreated, VHD can eventually lead to heart failure, arrhythmia, recurrent hospital admissions, reduced quality of life, and early morbidity and mortality.[2,3] With 2.5% of the US population diagnosed with VHD, and the increased prevalence in aging populations, VHD is a growing global health concern.[4] Recent data confirm that VHD is often underrecognized and poorly detected in its early stages, leading to diagnosis and intervention only

once the disease becomes symptomatic and advanced.[5] The lack of robust population-based screening and variable accessibility to advanced imaging results in many people being diagnosed late, especially in lower-resource settings and among the elderly.[6]

Challenges in the detection and treatment of VHD

A central challenge in the detection of VHD is that symptoms can be subtle and non-specific. Many people remain mostly asymptomatic until the disease stage is advanced.[6] Heart auscultation is the first-line screening tool for VHD, however, sensitivity is limited.[6,7] Transthoracic echocardiography (TTE) remains the standard diagnostic test for detection and assessment of VHD,[8] but cost and access to care present potential barriers.[6]
Identifying the optimal timing of intervention in people with VHD is a challenge, as the lack of validated biomarkers or reliable risk scores makes disease progression difficult to predict.[8] Notably, there are no effective disease-modifying medical therapies to slow or reverse disease progression.[3] Valve repair or replacement, either surgical or transcatheter, remains the definitive treatment, largely reserved for advanced disease.[8,9] While newer transcatheter devices have received regulatory approval and demonstrated effectiveness, durability concerns and access disparities remain, as well as uncertainty around the use in specific populations such as those with bicuspid aortic valve disease.[10]

Future directions in research

While the use of artificial intelligence (AI) has significantly advanced the field of multimodal cardiovascular imaging, offering numerous benefits in the detection and management of VHD, broad implementation and standardization of these tools remain critical gaps.[11,12] Underlying pathophysiological mechanisms of VHD are not fully understood.[3,13] Additionally, there is a need to explore the role of biological and genetic risk factors in the development and progression of VHD, particularly in bicuspid aortic valve disease.[3,10] Emerging directions include stem cell–based research into molecular pathology, further development of AI-enabled diagnostics, updated guideline metrics for risk-based surveillance, and novel pharmacological and device therapy trials, all aiming to address the core unmet needs in early detection, risk prediction, and non-surgical management avenues for VHD.[3,10-12]

PURPOSE

The intent of this initiative is to support a collaborative network of researchers whose collective efforts will lead to enhanced understanding of the earlier detection and/or delaying progression of valvular heart disease. Therefore, this Request for Proposals seeks applications that can address these critical questions and stimulate significant advances in these areas of valvular heart disease. **All proposed projects must address valvular heart disease**. Within that context and as presented above, an array of potential areas of investigation exists. Both human studies and appropriately designed animal models that can foster understanding of valvular heart disease may be proposed.

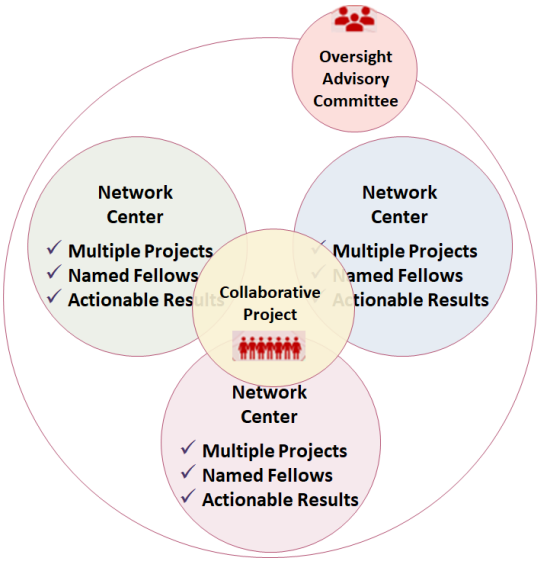
STUDY POPULATION(S)

- For studies involving human subjects, researchers must ensure that participant populations accurately reflect those affected by the disease under investigation. Efforts should be made to include individuals whose health criteria align with the prevalence and impact of the disease, thereby enhancing the relevance and applicability of the study findings.

- Important: Applicants should design studies that incorporate both realistic recruitment goals and sufficient statistical power to ensure valid results.

NETWORK OVERVIEW AND STRUCTURE

This SFRN on **Earlier Detection and Delaying Progression of Valvular Heart Disease** will consist of at least three centers, each of which will propose novel research studies to address this issue. Funded centers are expected to collaborate on solving the core issues underlying this problem, including via development of a common network-wide collaborative project (see below).



NETWORK CENTERS – Each center application will include two or three research projects. Applicants may choose the scientific approach (basic, clinical/translational, or population health studies) that most appropriately addresses the research question(s) being posed in each project. Projects should be individually meritorious and complement the broader theme of the center.

Projects may be from a single institution or from multiple institutions. A project principal investigator (PI) will lead each research project, and must have the necessary research team, required infrastructure and ability to conduct the proposed research.

One overall Center Director must be named (Co-Center Directors are not permitted). This key person will facilitate activities within their center and work closely with the other Network Center Directors to coordinate activities across the Network, including end-of-network deliverables.

At least one hospital site from each of the awarded Centers must join Target: Aortic Stenosis. More information about this requirement will be shared with awardees after the program begins.

OVERSIGHT ADVISORY COMMITTEE – An Oversight Advisory Committee (OAC) will be established to facilitate the success of this SFRN. The OAC will be comprised of volunteers who are subject matter experts in the focus areas.

APPLICATION DETAILS

NETWORK CENTER APPLICATION DETAILS

Award Duration: Four (4) years.

Number of Awards: The Heart Association anticipates awarding at least three (3) Network Center grants to establish this SFRN. Awardees will be selected based on scientific merit and how each group aligns with the association's mission and goals.

Collaborative Project: During Year 1 of the Network, the Centers will be required to develop a Network-wide Collaborative project, with cooperation from the Network Oversight Advisory Committee (OAC). The Collaborative project will start in Year 2. The Heart Association has set aside money for this effort, not to

exceed $1,800,000 for the Network. More details on the Collaborative project will be made available after the Centers are named.

Award Amount: The maximum budget amount a Center applicant may request is **$4,400,000**. The Heart Association reserves the right to determine the final award amount for competitive projects based on need and potential impact.

Appropriate Budget Items:

- Salary and fringe benefits for the Center Director, Principal Investigators, three named fellows, collaborating investigator(s), and other participating research staff or faculty.
- Project-related expenses, such as salaries of technical personnel essential to the conduct of the project, supplies, equipment, travel, and publication costs in accordance with institutional and Heart Association policies.
- Centers should use award dollars to pay for travel to two required face-to-face (as feasible), network-wide meetings each year and other meetings where SFRN research is presented. Additional details on bi-annual meetings will be conveyed to awarded centers following award activation. Centers should anticipate hosting at least one of the meetings on a rotating basis. The purpose of both meetings is to share results across the network and identify and act on potential collaborative opportunities. Additionally, there will be virtual meetings if face-to-face travel is not available. More information will be provided upon award and once travel options become clear.
- Institutional indirect costs for operating expenses may be charged up to ten percent (10%) of the total expenditures each year on awards at the awardee institution. Any subcontract awardee institution (if applicable) is allowed institutional indirect costs up to ten percent (10%) of the total expenditures of the subcontract. The awardee institution may not charge indirect costs on the direct costs of a subcontract.

Sample Center Budget	**Center Totals**
Projects: TWO or THREE projects over four years. *Maximum of $3.23M to be divided between/among the projects* *It is not required to spend funds equally across projects or years.*	**$ 3.23 M**
Fellows Each center must train 3 **post**doctoral fellows over the four-year grant period (for example, one fellow in years 1-2; one fellow in years 2-3; one fellow in years 3-4). Fellows must maintain a minimum of 75% effort to research training. See additional requirements for fellow appointment in the Named Fellows section of the RFP. *Up to $75,000 per fellow each year (salary +benefits)*	**$ 450 K**

Center Leadership The **ONE** Center Director (CD) must commit at least 20% effort. *A maximum of $50,000 salary (salary plus fringe/benefits) per year to cover effort associated with directing the Center.*	**$ 250 K**
Center Travel Costs Covers travel for Center personnel to attend network meetings and other integration activities. *$10,000 per year must be allocated to Center Travel.*	**$40 K**
One-time hosting of face-to-face scientific meeting	**$30 K**
Direct Costs (Total) Research Dollars	**$ 4.00 M**
Indirect Costs Heart Association Policy allows for a maximum of 10% for indirect costs	**$ 400 K**
Total	**$4.4 M**

Note for Center Applicants: There may be only one Center Director at each Center. This person will be responsible for the progress of the projects and overseeing the total budget for their grant. If awarded, the principal investigators and the institution assume an obligation to expend grant funds for the research purposes set forth in the application and in accordance with all regulations and policies governing the grant programs of the American Heart Association.

Center Directors and Project Principal Investigators:

- Must possess an MD, PhD, DO, DVM or equivalent doctoral degree at time of application.
- Must have a faculty or staff appointment.
- May hold another Heart Association award simultaneously.
- Must demonstrate a 20% minimum effort requirement for the Director and a 10% minimum effort requirement for Principal Investigators (PI) of Center projects.
- These responsibilities are mutually exclusive, i.e., a Center Director who also serves as a Project PI must contribute a combined effort of 30%. Each named Director and PI must be able to commit the minimum effort required and may not split these efforts across more than one person.

Citizenship Details*

Directors must have one of the following designations:

- U.S. citizen
- Permanent Resident
- Pending Permanent Resident (must have applied for permanent residency and have filed Form I-485 with the U.S. Citizenship and Immigration Services and have received authorization to legally remain in the U.S., having filed an Application for Employment Form I-765)
- G-4 Visa – family member of employee of international organizations and NATO

Principal Investigators of proposed projects must have one of the following designations:

- U.S. citizen
- Permanent Resident
- Pending Permanent Resident (must have applied for permanent residency and have filed Form I-485 with the U.S. Citizenship and Immigration Services and have received authorization to legally remain in the U.S., having filed an Application for Employment Form I-765)
- E-3 Visa – specialty occupation worker
- H1-B Visa – temporary worker in a specialty occupation
- O-1 Visa – temporary worker with extraordinary abilities in the sciences
- TN Visa – NAFTA professional
- G-4 Visa - family member of employee of international organizations and NATO

Named Fellows
The Association believes that including individuals of all backgrounds is an essential component to driving its mission. We strongly encourage awardees to name fellows who have faced special challenges or obstacles to their careers and those who have experienced varied and non-traditional career trajectories.

Each fellow must have one of the following designations:
- U.S. citizen
- Permanent Resident
- Pending Permanent Resident (must have applied for permanent residency and have filed Form I-485 with the U.S. Citizenship and Immigration Services and have received authorization to legally remain in the U.S., having filed an Application for Employment Form I-765)
- E-3 Visa – specialty occupation worker
- H1-B Visa – temporary worker in a specialty occupation
- O-1 Visa – temporary worker with extraordinary abilities in the sciences
- TN Visa – NAFTA professional
- J-1 Visa – exchange visitor
- F-1 Visa – student
- G-4 Visa - family member of employee of international organizations and NATO

  A named fellow may not hold another comparable fellowship award, although the institution may provide supplemental funding. Fellows may not hold a faculty or staff appointment, except for MD or MD/PhD trainees who also maintain clinical responsibilities. These fellows may hold the title of instructor or similar due to their patient care responsibilities but must devote at least 75% effort to research training.

*****All awardees must meet the citizenship criteria throughout the duration of the award.

PEER REVIEW

General: Peer Review will be a two-phase process. Projects/Science from the Network Centers will be scored during Phase 1. Network Center applications that advance past Phase 1 will undergo a separate Phase 2 review. This review will focus on the overall vision of the center, synergy and collaborative possibilities within a Center (via the Center application) and across Centers, and the training plan and environment.

Phase 2 will occur 2-4 weeks after Phase 1 review. Criteria for both phases of review follow.

Peer Review Criteria for PROJECT Applications

Phase 1 Review
Each **PROJECT** within a Center application will be scored individually according to the criteria below.

Projects – Potential impact of the project on research in the field of the designated research topic; strengths of applicant investigators (qualifications, expertise and productivity); potential for collaboration or synergy of projects; scientific content; background; preliminary studies; detailed specific aims; approach detail; analytical plan; sample size; data management; significance; innovation; individual project scientific merit; and total project coordination (within and among projects). Projects will be rated on the following areas:

- **Approach**: Are the conceptual framework, design, methods and analyses adequately developed, well-integrated, well-reasoned and feasible (as determined by preliminary data) and appropriate to the aims of the project? Does the applicant acknowledge potential problem areas and consider alternative tactics? Does each applicant develop a plan for interoperability of data between Centers and with National or International Standards?

  NOTE: Applicants must explain how relevant biological variables, such as sex, are factored into the research design, analysis and reporting. Furthermore, very strong justification from the scientific literature must be provided for applications proposing to study only one sex.
- **Innovation**: Is the project original and innovative? For example: Does the project challenge existing paradigms and address an innovative hypothesis or critical barrier to progress in the field? Does the project develop or employ novel concepts, approaches, methodologies, tools or technologies for this area?
- **Investigator(s)**: Is the investigator(s) appropriately trained and well-suited to carry out this work? Is the work proposed appropriate to the experience level of the principal investigator and other researchers? Does the investigative team bring complementary and integrated expertise to the project (if applicable)? Project PIs must dedicate at least 10% to the project.
- **Significance**: Does this study address an important problem related to valvular heart disease, specifically exploring the earlier detection and/or delaying progression of valvular heart disease? If the aims of the application are achieved, how will mechanistic understanding of mediators related to valvular heart disease be advanced? What will be the effect of these studies on the concepts, methods and technologies that drive this field?
- **Environment**: Does the scientific environment in which the work will be done contribute to the probability of success? Do the proposed studies benefit from unique features of the scientific environment, or subject populations, or employ useful collaborative arrangements? Is there evidence of institutional support?
- **Impact**: How does the project relate to and support the mission of the American Heart Association– *To be a relentless force for a world of longer, healthier lives*?

- **Synergy**: How does this project enhance the Center and the additional science project(s)? i.e., does this project enhance the likelihood that the collective Center outcomes will exceed outcomes of the individual sum of its distinct components? Synergy is the ability of a group to produce something greater than the sum of its parts; the ability of the group to outperform even its best individual member. ***Only projects that demonstrate synergy will move forward to Phase 2.***
- **Lay Summary/Summary for Non-Scientists:** How well written is the lay summary in explaining to a non-scientist audience the research proposed and importance? Does the Lay Summary adequately explain the major health problem being addressed by this study? Does it provide specific questions and how the projects will address them? Does it provide information on the overall impact of this work and the potential advances in the field? **Does it relay how the proposal supports the mission of the American Heart Association?**

Peer Review Criteria for CENTER Applications

Phase 2 Review
Each **NETWORK CENTER** moving beyond Phase I Review will be scored on the following:

- **Synergy** – A clear vision of scientific direction is expected. A Center should be viewed as a group of interrelated research projects, each of which is not only individually scientifically meritorious, but also complements the other projects and contributes to an integrating theme. Describe the rationale for the total program. Explain the strategy of achieving the objectives of the overall program and how each individual project relates to the strategy. Describe the synergies and interactions among projects and their investigators. Is there evidence of synergy among the projects and training component of the Center?
- **Collaboration** – History of collaboration, as well as the ability and commitment to collaborate with other institutions, investigators and within the applicant institution as well as within the awarded Network. Defined and detailed process for collaboration with other sites in addition to within and among the proposed projects; plans to actively participate in a collaborative network. Evidence of formal training in leadership skills with an emphasis on collaborative leadership will be favorably reviewed. What collaborations do you envision between investigators working on individual projects?
- **Interaction Plan within and among this Network and other Heart Association Networks** (if appropriate) – Plan for and commitment to sharing knowledge and methods, providing a stimulating atmosphere for research collaborations, and providing networking opportunities for trainees. Cited strategies for communication and interaction among the Centers. Centers proposing clinical projects must document that they have sufficient volume of patients from all identified study populations to ensure robust results are achievable.
- **Training component –** A detailed plan for developing and implementing a postdoctoral training program that includes clinical (M.D., D.O., PharmD) or Ph.D. training in research in the field outlined by the RFA; qualifications and characteristics of current and anticipated trainees; didactic and practicum training opportunities; plan for the selection of prospective fellows and how funded fellows' ongoing progress will be guided via an individual development plan (IDP) and evaluated at least annually. Plan for involving fellows in annual Center meetings and Center-to-Center visits, along with identifying opportunities for fellows to work with established investigators at other

network Centers; ability to track trainees; conferences and meeting participation for trainees; documentation of a ready supply of fellows; and history of successful fellowship training for researchers in the appropriate research topic.

- **Center Director** – Qualifications of the Director to provide scientific and administrative leadership for the Center; demonstrated ability to lead others, along with experience and commitment to the success of the Center, the projects contained within, and the Network. Documented evidence of willingness to collaborate with others outside their institution to share ideas, science, etc., to advance the research in the intended area.
- **Investigator Team** – Qualifications of each PI to provide scientific and administrative leadership for their respective projects; demonstrated commitment of each PI, and experience in the area(s) of studies proposed; qualifications of investigators, and co-investigators and the research team; training experience. The Heart Association believes that including individuals of all backgrounds is an essential component to driving its mission. We strongly encourage applications by individuals who have faced special challenges or obstacles to their careers and those who have experienced varied and non-traditional career trajectories.
- **Environment** – Institutional commitment, resources and facilities to sustain the Center; institutional resources available to complete the project; analytical resources available to the project; letter from Center Director's Department Head assuring the department and institution's support of the Center along with confirmation that the Center Director will devote at least 20% effort towards the Center. Other Center personnel may be appointed to assist the Director in the administration of the Center. However, the Director will be required to devote 20% effort to the Center.

For more information on Peer Review of submitted applications, including information on reverse site visits, see the Peer Review section of the SFRN General Information page on the Heart Association's SFRN website.

Applicants are prohibited from contacting Heart Association peer reviewers. This is a form of scientific misconduct and will result in removal of the application from funding consideration and institutional notification of misconduct.

AWARD SELECTION - Final funding decisions are subject to approval by the American Heart Association.

RELEVANT POLICIES AND REQUIREMENTS

Institutional Eligibility / Location of Work:

Heart Association awards are limited to U.S.-based non-profit institutions, including medical, osteopathic and dental schools, veterinary schools, schools of public health, pharmacy schools, nursing schools, universities and colleges, public and voluntary hospitals and others that can demonstrate the ability to conduct the proposed research. Applications will not be accepted for work with funding to be administered through any federal institution or work to be performed by a federal employee, except for Veterans Administrations employees.

The **Centers are not transferable** to other institutions. **An institution may submit only one Center (and related Projects) application in response to this RFP.** Individuals at the applicant institution who are not participating in their institution's center and project(s) application may participate in a separate institution's Center application. Individuals other than the Center Director who are participating in their institution's Center application may participate in a separate institution's Center application. The application may include individuals and/or projects at more than one institution provided there is evidence supporting the likelihood of a successful interaction among research and training personnel.

The *submitting institution* is responsible for ensuring that only one proposal is submitted for the institution or to coordinate across several institutions to create a single application. The Center Director's institution will maintain fiscal responsibility for the entire award.

The Precision Medicine Platform: Applicants are encouraged to make use of Heart Association's Precision Medicine Platform (PMP), powered by Amazon Web Services.

- The PMP supports cloud computing in a secure and private workspace and enables investigators to collaborate and analyze data securely. *The Heart Association will provide each project with a workspace and the use of cloud credits for all funded applications.*

- Data analysis is enabled in secure workspaces by a friendly web user interface that allows researchers to code in various languages, including R and Python and use statistical software including but not limited to SAS and R studio. The most up-to-date machine learning and artificial intelligence software available from Amazon Web Services is also included. For a full list of the analytical tools available, please see AHA - Precision Medicine Platform - Tools & Features (https://pmp.heart.org/tools). Researchers are also able to upload their own tools.

- To learn more about the Precision Medicine Platform and how it can enable your research, please visit https://pmp.heart.org/. Additional questions can be answered on the Heart Association Application Resources Page under the Precision Medicine Platform Header.

- The PMP is HIPAA and FedRAMP compliant.

Interim Assessment: Awardees must report progress on a minimum annual (once per year) basis. Progress may take the form of a required written report in addition to video conferencing, phone calls, and/or face-to-face visits. Reporting will be focused on the achievement of stated milestones as indicated in the project timeline. The OAC reserves the right to request additional updates, site visits, or reporting.

Links and References to Relevant Heart Association Policies:

- **Public Access**: The American Heart Association's public access policy requires that all journal articles resulting from Heart funding be made freely available in PubMed Central (PMC) and attributed to a specific Heart Association award within 12 months of publication. It is the responsibility of the awardee to ensure journal articles are deposited into PMC.
- **Open Data**: Any factual data that is needed for independent verification of research results must be made freely and publicly available in a Heart Association-approved repository as soon as possible, and

no later than the time of an associated publication or the end of the award period (and any no-cost extension), whichever comes first. For more information on the above policies, see Heart's Open Science Policy webpage.

- **Preregistration:** the Heart Association requires preregistration for any funded clinical trials and encourages preregistration for any studies that make an inferential claim from a sampled group or population, as well as studies that are reporting and testing hypotheses. After a project is completed, protocols and preregistration analysis plans can be used in conjunction with the final study and analysis by researchers seeking to replicate, reproduce, and build upon findings. See the Association's preregistration information.
- **Other**: The projects described can have no scientific or budgetary overlap with other funded work. Any inventions, intellectual property, and patents resulting from this funding are governed by the Heart Association's Intellectual Property Policy for Research Funding EXCEPT to the extent modified by specific Intellectual Property terms for this award mechanism, including financial terms, which will be communicated to awardees following the review process. The applicant/awardee and institution are responsible for compliance with all Heart Association research award policies and guidelines for the duration of any awards they may receive. Visit the Research Programs Awards Policies page for more information on this topic: Heart Association Policies Governing All Research Awards.

PROPOSAL SUBMISSION

Pre-Proposals must be submitted electronically via ProposalCentral. Applicants can create required documents in advance; refer to the Heart Association Application Instructions (PDF). All submissions require the signature of a designated institutional representative.

Other Features of this American Heart Association Research Opportunity:

- Heart Association awards are open to an array of academic and health professionals. This includes but is not limited to all academic disciplines (biology, chemistry, mathematics, technology, physics, etc.) and all health-related professions (physicians, nurses, nurse practitioners, pharmacists, dentists, physical and occupational therapists, statisticians, nutritionists, etc.).
- The Association believes that including individuals of all backgrounds is an essential component to driving its mission. We strongly encourage applications by individuals who have faced special challenges or obstacles to their careers and those who have experienced varied and non-traditional career trajectories.

REFERENCES

1. Valvular heart disease. In: Institute of Medicine (US) Committee on Social Security Cardiovascular Disability Criteria. *Cardiovascular Disability: Updating the Social Security Listings.* National Academies Press (US); 2010: chap 12. https://www.ncbi.nlm.nih.gov/books/NBK209979/
2. Kubala M, de Chillou C, Bohbot Y, Lancellotti P, Enriquez-Sarano M, Tribouilloy C. Arrhythmias in patients with valvular heart disease: Gaps in knowledge and the way forward. *Front Cardiovasc Med.* 2022;9(792559). doi:10.3389/fcvm.2022.792559.

3. Small AM, Yutzey KE, Binstadt BA, et al. Unraveling the mechanisms of valvular heart disease to identify medical therapy targets: A scientific statement from the American Heart Association. *Circulation*. 2024;150(6). doi:10.1161/cir.0000000000001254
4. Martin SS, Aday AW, Allen NB, et al. 2025 Heart disease and stroke statistics: A report of US and global data from the American Heart Association. *Circulation*. 2025;151(8). doi:10.1161/cir.0000000000001303 Davidson LJ, Tang GHL, Ho EC, et al. The Tricuspid Valve: A review of pathology, imaging, and current treatment options: Valvular heart disease. In: Institute of Medicine (US) Committee on Social Security Cardiovascular Disability Criteria. *Cardiovascular Disability: Updating the Social Security Listings.* National Academies Press (US); 2010: chap 12. https://www.ncbi.nlm.nih.gov/books/NBK209979/
5. Davidson LJ, Tang GHL, Ho EC, et al. The Tricuspid Valve: A review of pathology, imaging, and current treatment options: A scientific statement from the American Heart Association. *Circulation*. 2024;149(22). doi:10.1161/cir.0000000000001232
6. Wang, Y, Cao, T, Liu, X. et al. A new benchmark for modern management of valvular heart disease: The whole-life cycle management system. *JACC: Asia*. 2025;5(5):609–632. doi:10.1016/j.jacasi.2025.01.017
7. Gardezi SKM, Myerson SG, Chambers J, et al. Cardiac auscultation poorly predicts the presence of valvular heart disease in asymptomatic primary care patients. *Heart*. 2018;104(22):1832-1835. doi:10.1136/heartjnl-2018-313082
8. Otto CM, Nishimura RA, Bonow RO, et al. 2020 ACC/AHA guideline for the management of patients with valvular heart disease: A report of the American College of Cardiology/American Heart Association joint committee on clinical practice guidelines. *Circulation*. 2020;143(5). doi:10.1161/cir.0000000000000923
9. Jneid H, Chikwe J, Arnold SV, et al. 2024 ACC/AHA clinical performance and quality measures for adults with valvular and structural heart disease: A report of the American Heart Association/American College of Cardiology joint committee on performance measures. *Circ: Cardiovasc Qual Outcomes*. 2024;17(4). doi:10.1161/hcq.0000000000000129
10. Aikawa E, Blaser MC, Singh SA, Levine RA, Yacoub MH. Challenges and opportunities in valvular heart disease: From molecular mechanisms to the community. *Arteriosclerosis, Thrombosis, and Vascular Biology*. 2024;44(4):763-767. Doi.org/10.1161/atvbaha.123.319563
11. Sengupta PP, Kluin J, Lee SP, Oh JK, Smits AIPM. The future of valvular heart disease assessment and therapy. *The Lancet*. 2024;403(10436):1590-1602. doi:10.1016/s0140-6736(23)02754-x
12. Bamford P, Abdelrahman A, Malkin CJ, et al. Artificial intelligence in heart valve disease: Diagnosis, innovation and treatment. A state-of-the-art review. *British Journal of Cardiology*. 2024;31. doi:10.5837/bjc.2024.031
13. Shen M, Wu JC. Empowering valvular heart disease research with stem cell-derived valve cells. *Circulation*. 2024;149(18):1457-1460. doi:10.1161/CIRCULATIONAHA.124.068656