# Recordis™ for Aortic Stenosis

RECORDIS
Cardiac Sensor System

Standardized SCG-Based Cardiac Timing Analysis for AS Research and Monitoring

## The Problem

Aortic stenosis (AS) affects approximately 10% of adults over age 80, and the at-risk population will double over the next two decades [1–3]. Many patients remain asymptomatic until late-stage disease — yet fewer than half of eligible patients receive timely valve replacement [4]. The gap is not in therapy but in identification: TAVI is widely adopted, minimally invasive, and often performed with same-day discharge [5]. Patients treated at advanced stages generate $27,000–$36,000 more in first-year healthcare costs. A 12-month delay in intervention increases two-year costs by approximately $10,000 per patient [6].

Current tools — auscultation and echocardiography — are resource-intensive, operator-dependent, and difficult to scale. What is needed is a rapid, standardized method of cardiac signal analysis that could support earlier referral to definitive imaging.

## Recordis Cardiac Signal Analysis

Recordis is a seismocardiography system that captures cardiac mechanical signals through a non-invasive sensor placed on the base of sternum. In under 60 seconds, without a sonographer, Recordis produces standardized timing and amplitude markers through an independent algorithm — removing traditional operator variability [7]. In the context of aortic stenosis, Recordis captures:

- **Aortic valve opening (AVO)** and early aortic motion events
- **Standardized Aortic Twist (ATT)** — a novel amplitude marker derived from the first aortic motion immediately following valve opening, indexed for BMI and signal variability to enable direct comparison across individuals
- **Pre- and post-intervention timing changes** — our published TAVI study demonstrated that Recordis captures changes in cardiac cycle intervals consistent with established echocardiographic findings, without additional staff, time, or equipment [7]

ATT is transparent, physiologically grounded, and produces a clinically interpretable threshold with immediate analytical output — without reliance on machine learning.

## The Evidence

Our research demonstrates strong discrimination between severe AS and non-AS patients using standardized ATT, presented at SCAI 2026.

| Metric | Result |
|---|---|
| Optimal standardized ATT threshold | 0.64 (lower values associated with AS) |
| AUC | 0.94 — excellent discriminative performance |
| Sensitivity | 87% — correctly identifying patients with AS |
| Specificity | 88% — correctly identifying patients without AS |
| Positive Predictive Value | 84% — identifying the accuracy of a positive SCG finding |
| Negative Predictive Value | 90% — identifying the accuracy of a negative SCG finding |

**Study population:** Symptomatic AS patients (NYHA ≥2) scheduled for TAVI, with control (non-AS) patients undergoing non-emergent cardiac catheterization. 1-minute Recordis recording at baseline, 24 hours post-intervention, and 4–6 month follow-up.

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### Investigational Use Only Under FDA Review

Commercial validation being planned in rural Canada. Studies exploring cardiac data applications in chronic disease prevention, triage optimization, and resource allocation efficiency.

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These results demonstrate that a single, reproducible SCG amplitude marker can discriminate severe AS from non-AS with performance comparable to established diagnostic tests.

## Clinical Relevance

**For Clinicians:** Recordis provides cardiac timing markers — including MPI, IVCT, ejection time, and diastolic intervals — that are clinically valuable but difficult to obtain reproducibly through current methods. Our AS research suggests future potential for these measurements to offer additional context to support decisions about patient referral, especially in environments with limited access to imaging.

**For Researchers & PIs:** Recordis is portable, operator-independent, and requires no imaging infrastructure. Its pragmatic nature allows for integration into existing study protocols with minimal burden — a 1-minute recording that produces standardized, reproducible data. Multi-site deployment is already operational across research partnerships in New York, San Francisco, and Calgary.

**For Industry & Pharma:** Recordis produces structured cardiac timing data at scale across distributed research sites. For trials where echocardiographic follow-up is a limiting factor — cost, patient compliance, site variability — Recordis has the potential to offer a standardized, repeatable data source that can complement clinical endpoints.

## Ongoing Validation

External validation is underway with 500+ all-comers patients across clinical sites in New York and San Francisco, with core lab echocardiographic analysis in Quebec. This study extends findings to asymptomatic patients and across grades of AS severity — building the evidence base for clinical integration.

We are actively seeking research collaborators. Recordis is currently deployed in multi-site research partnerships across New York, San Francisco, and Calgary. If your institution or your trials could benefit from standardized, reproducible cardiac timing data in the context of aortic stenosis, contact us at the booth or through the QR code below.

## References


1. Benjamin, E.J.; Blaha, M.J.; Chiuve, S.E.; Cushman, M.; Das, S.R.; Deo, R.; de Ferranti, S.D.; Floyd, J.; Fornage, M.; Gillespie, C.; et al. Heart Disease and Stroke Statistics-2017 Update: A Report From the American Heart Association. Circulation 2017, 135, e146-e603, doi:10.1161/CIR.0000000000000485.

2. Nkomo, V.T.; Gardin, J.M.; Skelton, T.N.; Gottdiener, J.S.; Scott, C.G.; Enriquez-Sarano, M. Burden of valvular heart diseases: a population-based study. Lancet 2006, 368, 1005-1011, doi:10.1016/s0140-6736(06)69208-8.

3. Eveborn, G.W.; Schirmer, H.; Heggelund, G.; Lunde, P.; Rasmussen, K. The evolving epidemiology of valvular aortic stenosis. the Tromsø study. Heart 2013, 99, 396-400, doi:10.1136/heartjnl-2012-302265.

4. Li, S.X.; Patel, N.K.; Flannery, L.D.; Selberg, A.; Kandanelly, R.R.; Morrison, F.J.; Kim, J.; Tanguturi, V.K.; Crousillat, D.R.; Shaqdan, A.W.; et al. Trends in Utilization of Aortic Valve Replacement for Severe Aortic Stenosis. J Am Coll Cardiol 2022, 79, 864-877, doi:10.1016/j.jacc.2021.11.060.

5. Genereux, P.; Schwartz, A.; Oldemeyer, J.B.; Pibarot, P.; Cohen, D.J.; Blanke, P.; Lindman, B.R.; Babaliaros, V.; Fearon, W.F.; Daniels, D.V.; et al. Transcatheter Aortic-Valve Replacement for Asymptomatic Severe Aortic Stenosis. N Engl J Med 2025, 392, 217-227, doi:10.1056/NEJMoa2405880.

6. Sethi, A.; Elmariah, S.; Gunnarsson, C.; Ryan, M.; Chikermane, S.; Thompson, C.; Russo, M. The Cost of Waiting for a Transcatheter Aortic Valve Replacement in Medicare Beneficiaries With Severe Aortic Stenosis. Struct Heart 2024, 8, 100321, doi:10.1016/j.shj.2024.100321.

7. Singh, J.; Gagarinova, M.; Ellingson, C.J.; Booker, J.; Pibarot, P.; Neary, J.P.; Dehghani, P. Monitoring Cardiac Function Using Seismocardiography Post-Transcatheter Aortic Valve Implantation. JACC Adv 2025, 4, 101664, doi:10.1016/j.jacadv.2025.101664.


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