HeartLung.AI Concludes ESC Congress 2026 With Unprecedented 10-Study Program and Agatston-2.0 Results

Company-record scientific program shows how AI can uncover coronary, chamber, valvular, plaque and lung cancer risk insights from routine CT.

Dr. Amir Azimi Presenting HeartLung's Agatston 2.0

MUNICH , GERMANY, September 3, 2026 /EINPresswire.com/ -- HeartLung.AI today announced the successful completion of a company-record scientific program at ESC Congress 2026 in Munich, where its investigators and academic collaborators presented 10 studies advancing artificial intelligence for cardiovascular prevention, coronary calcium assessment, cardiac chamber analysis, structural heart disease, cardiometabolic phenotyping, and opportunistic lung cancer risk assessment from routine CT imaging.

The post-congress program builds directly on HeartLung.AI's May announcement that 10 abstracts had been accepted to ESC.26. With the studies now presented, the scientific story has moved from breadth to evidence: the research demonstrates how a single CT examination can yield substantially more clinically relevant information than conventional one-purpose interpretation, often without additional imaging, contrast, radiation, or scan time.

Across the 10 presentations, HeartLung.AI researchers evaluated AI-derived coronary calcium, plaque characteristics, cardiac chamber volumes, epicardial adipose tissue, aortic valve disease, cardiometabolic phenotypes, and lung cancer risk. Together, the studies support the company's broader AI-CVD strategy: transforming existing CT imaging into a scalable platform for quantitative, multi-organ preventive assessment.

"ESC Congress 2026 gave us the opportunity to move beyond announcing the work and show the data. These 10 presentations reflect the scientific depth behind AI-CVD and our belief that routine CT scans can become far more powerful tools for prevention when AI is used to measure the information that is already there."
— Morteza Naghavi, MD, Founder and President/CEO, HeartLung.AI

Agatston-2.0: Refining the "Power of Zero"
A major scientific highlight at ESC.26 was Agatston-2.0, HeartLung.AI's next-generation AI-based coronary calcium quantification framework. The traditional Agatston score has shaped preventive cardiology for more than three decades, but its fixed 130-HU threshold, minimum lesion-size requirements, slice-thickness dependence, and peak-density weighting can leave very small or lower-density calcification unmeasured.

Agatston-2.0 is designed to preserve the clinical strength of coronary calcium scoring while using modern AI and quantitative CT methods to measure subtle calcification more continuously. The approach combines deep-learning coronary segmentation, image calibration and noise normalization, voxel-level density weighting, and spatial filtering on the same non-contrast CT scan.

In the ESC study of 3,965 participants from MESA and the Framingham Heart Study who had a conventional CAC score of zero, Agatston-2.0 detected AI-CAC above zero in 862 participants, or 21.7%. After adjustment for traditional cardiovascular risk factors, detectable AI-CAC was associated with 73% higher risk of myocardial infarction, 85% higher risk of hard coronary heart disease, and 71% higher risk of all coronary heart disease. Ten-year progression to conventional CAC above zero was also higher among those with AI-detected calcium (66.3% versus 43.4%).

Importantly, the findings do not reject the established "power of zero." They refine it. Individuals

with no detectable calcification even by Agatston-2.0 represented an especially low-risk group, while AI-detected sub-threshold calcification identified meaningful risk heterogeneity hidden inside the conventional CAC-zero population. When Agatston-2.0 was considered alongside additional AI-CVD imaging biomarkers from the same CT, predicted 10-year cardiovascular risk within the conventional CAC-zero group ranged from approximately 0.3% to 15.7%.

Same scan. No additional radiation. More precise characterization of coronary calcium and cardiovascular risk.

HeartLung.AI's 10 Scientific Presentations at ESC Congress 2026

1. Agatston-2.0: A Next-Generation AI-Based Coronary Calcium Quantification Approach to Improve Risk Stratification Among Individuals with Zero Agatston Scores — Part I
This study evaluated 3,965 individuals from MESA and the Framingham Heart Study who had a conventional CAC score of zero. Agatston-2.0 detected AI-derived coronary calcium in 21.7% of these individuals. Those with AI-CAC greater than zero demonstrated significantly higher long-term coronary heart disease risk and greater progression to conventional CAC positivity. Agatston-2.0 uses the same non-contrast CT scan without additional radiation while applying AI-based coronary segmentation, calibration, continuous voxel-level density weighting and spatial filtering to detect subtle calcification that conventional threshold-based scoring can miss.

2. Agatston-2.0: AI-Derived Calcium Burden and Plaque Density Profiling Improve CHD Risk Stratification Within CAC Scores 1–99 — Part II
This study examined 1,542 participants from MESA and the Framingham Heart Study with a median 12.5 years of follow-up. Agatston-2.0 goes beyond the conventional calcium score by evaluating plaque density, distribution and related calcium characteristics. Within the traditionally broad CAC 1–99 category, 33% of participants were up-classified and accounted for 52% of 10-year CHD events, while 41% were down-classified to less than 5% 10-year risk. The approach produced a +34.8% net reclassification using information from the same CAC scan.

3. Automated Epicardial Adipose Tissue Analysis Identifies Increased Non-Calcified Plaque Burden in Non-Obese Individuals with Low CAC Scores — An AI-CVD Study within the Miami Heart Study
In 1,259 Miami Heart Study participants with paired CAC and CCTA scans, AI-derived epicardial adipose tissue measurements identified substantial differences in non-calcified coronary plaque burden that were not apparent from BMI or CAC score alone. Among participants with BMI below 29, non-calcified plaque burden increased approximately 93% per standard-deviation increase in epicardial fat, while low-CAC participants in the highest epicardial-fat quartile had approximately three times the median non-calcified plaque burden of those in the lowest quartile.

4. Cardiometabolic Phenotyping from Coronary Artery Calcium Scans Predicts Obstructive and High-Risk Plaques on Coronary CT Angiography — An AI-CVD Study within the Miami Heart

Study
Using paired CAC and CCTA imaging from 1,259 asymptomatic Miami Heart Study participants, investigators evaluated whether comprehensive AI-CVD phenotyping could identify coronary disease characteristics beyond what is captured by traditional calcium scoring. The AI-CVD model achieved an AUC of 0.957 for obstructive stenosis compared with 0.881 using Agatston CAC alone, 0.789 versus 0.626 for high-risk plaque, and 0.771 versus 0.679 for non-calcified plaque. The findings demonstrate the potential for a routine CAC scan to serve as a much broader cardiometabolic imaging examination.

5. Comparison of AI-Enabled Cardiac Chambers Volumetry Based on Non-Gated Chest CT Scans with Echocardiography
This MESA study evaluated 1,675 participants who underwent both non-gated, non-contrast chest CT and echocardiography, examining whether AI-derived cardiac chamber measurements from routinely acquired chest CT can provide clinically meaningful information comparable with echocardiography for heart failure and atrial fibrillation assessment. The work supports the broader potential for opportunistic cardiovascular evaluation from millions of chest CT examinations already performed for other clinical reasons.

6. Heart Failure and Atrial Fibrillation Prediction from Non-Gated Chest CT Using AI-Based Cardiac Chamber Volumetry — An AI-CVD Study within MESA
Among 2,053 MESA participants, AI-derived chamber measurements from routine non-gated chest CT demonstrated high agreement with measurements obtained from ECG-gated cardiac CT, including ICCs of 0.94 for left atrial volume, 0.95 for left ventricular volume and 0.96 for LV mass. Importantly, non-gated CT measurements were non-inferior to gated CT measurements for predicting future heart failure and atrial fibrillation, supporting a potentially scalable approach to opportunistic cardiac risk assessment.

7. Long-Term Prediction of Incident Aortic Stenosis Using AI-CVD-Derived Phenotypes from Noncontrast Cardiac CT — The Multi-Ethnic Study of Atherosclerosis
The study analyzed 5,520 MESA participants over approximately two decades and assessed 25 AI-CVD-derived imaging phenotypes for their relationship with future aortic stenosis. Aortic valve calcification was the strongest individual predictor, while the broader AI-CVD model achieved a 10-year AUROC of 0.973 compared with 0.809 for the clinical model, demonstrating the potential to identify valvular disease risk years before clinical recognition.

8. AI-Derived Left Atrial Volume Index, LA/RA and LA/LV Volume Ratios from Coronary Artery Calcium Scans Predict Long-Term Atrial Fibrillation and Stroke
Using MESA and Framingham Heart Study data with follow-up extending up to 17 years, investigators evaluated AI-derived left atrial volume index and cardiac chamber volume ratios from routine CAC scans for their association with future atrial fibrillation and stroke. The study demonstrates how automated chamber volumetry can extend a conventional coronary calcium examination beyond coronary disease assessment and provide additional information relevant to long-term cardiovascular risk.

9. Long-Term Lung Cancer Risk Prediction Using Sybil AI on Routine Coronary Artery Calcium Scans
This study evaluated baseline CAC scans from 5,726 MESA participants with follow-up extending up to 15 years. Using only imaging from the baseline CAC scan—and without smoking history or other clinical risk factors—Sybil AI identified imaging signals associated with future lung cancer risk. Predictive performance remained near 70% AUC through much of long-term follow-up and approximately 68% at 15 years, highlighting the possibility that cardiac CT examinations could contribute to lung cancer risk assessment without requiring another scan.

10. Performance of Sybil AI for Lung Cancer Risk Assessment: A Head-to-Head Comparison of Cardiac vs. Lung CT Scans
Investigators evaluated Sybil AI on 4,486 cardiac CAC and chest CT scans from the Framingham Heart Study and MESA. Despite the more limited lung field of view available on cardiac CT, Sybil maintained an AUC above 0.80 for lung cancer risk prediction through six years. The findings suggest that CT scans originally obtained for cardiovascular prevention may also contain clinically meaningful information about future lung cancer risk.

From One Measurement to a Multidimensional CT Assessment
The scientific program reinforces a central premise behind AI-CVD: the value of a CT scan should not be limited to the single question that originally prompted the examination. Modern AI can automatically segment anatomy and quantify imaging biomarkers across multiple organ systems, allowing compatible scans to support a broader preventive assessment.
HeartLung.AI's FDA-cleared AI-CVD platform is designed to extract quantitative measurements that include coronary artery calcium, thoracic aortic and valvular calcium, cardiac chamber volumes and left ventricular mass, aortic and pulmonary artery dimensions, epicardial fat, liver attenuation, muscle and visceral fat composition, lung density, and bone mineral density. The ESC research program extends the evidence base around how these CT-derived phenotypes may relate to future cardiovascular and multisystem outcomes.
This approach is particularly relevant to opportunistic screening: analyzing scans that patients are already receiving and using AI to surface additional quantitative information for clinician review. Rather than requiring a separate examination for every risk domain, the goal is to responsibly unlock more information from existing imaging and help clinicians identify patients who may warrant further evaluation, monitoring, or preventive intervention.

Recognizing the ESC.26 Research Team and Collaborators
HeartLung.AI recognizes the physicians, scientists, engineers, and academic collaborators whose contributions supported the ESC Congress 2026 program, including:
Arthur Agatston, MD, FACC — Chairman and CEO, The Agatston Center for Preventive Medicine, Miami Beach, Florida; creator of the Agatston Score.
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Morteza Naghavi, MD — Founder and President/CEO, HeartLung.AI, Houston, Texas.

Looking Ahead

Following ESC Congress 2026, HeartLung.AI will continue advancing AI-CVD, Agatston-2.0, and its broader CT-based prevention research through multi-institutional collaborations, clinical

validation, and deployment initiatives. The company's objective is to make quantitative analysis of existing imaging more comprehensive, scalable, and clinically useful—helping healthcare organizations move from late-stage disease response toward earlier detection and prevention.

One Scan. Many Answers

About HeartLung.AI
HeartLung.AI is a health-tech company pioneering AI-driven preventive imaging for early detection of cardiovascular disease, lung cancer, COPD, osteoporosis, fatty liver disease, myosteatosis and other cardiometabolic conditions detectable on routine medical imaging. Its FDA-cleared flagship platform, AI-CVD, transforms eligible CT scans into comprehensive preventive health assessments by automatically quantifying coronary artery calcium, aortic and valvular calcification, cardiac chamber size, aorta and pulmonary artery size, epicardial and visceral fat, liver density, lung density, bone mineral density and muscle-fat composition. HeartLung requires no new hardware or local software installation. Hospitals and imaging centers can connect PACS to the HeartLung.AI cloud or manually upload scans and receive AI-generated DICOM and PDF reports.
Learn more about HeartLung.AI's ESC Congress 2026 research and presentations at:
https://www.heartlung.ai/slide-presentations

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