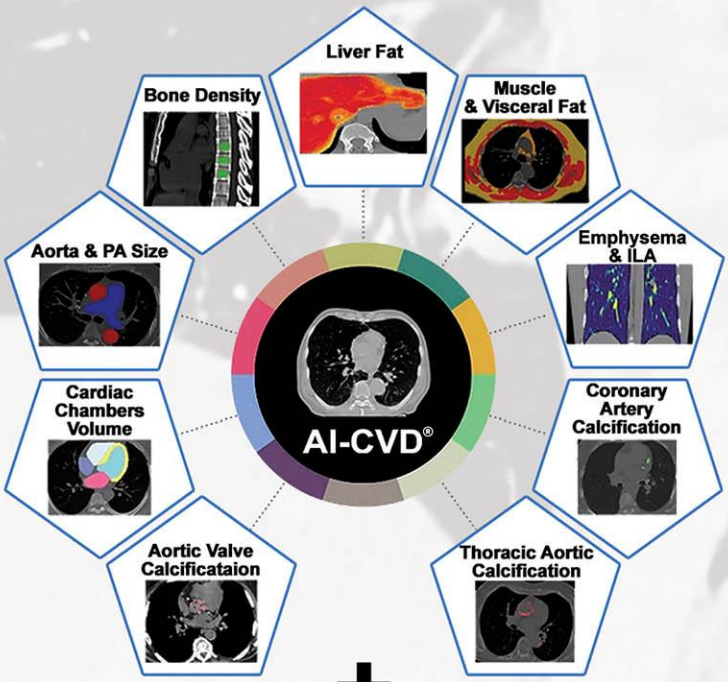
HeartLung Technologies

FDA-Cleared

AI-CVD®

The Broadest Opportunistic Cardiovascular and Multisystem Screening Platform Ever Authorized for CT Scans



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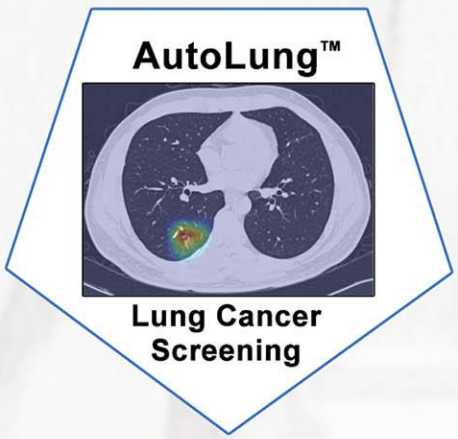
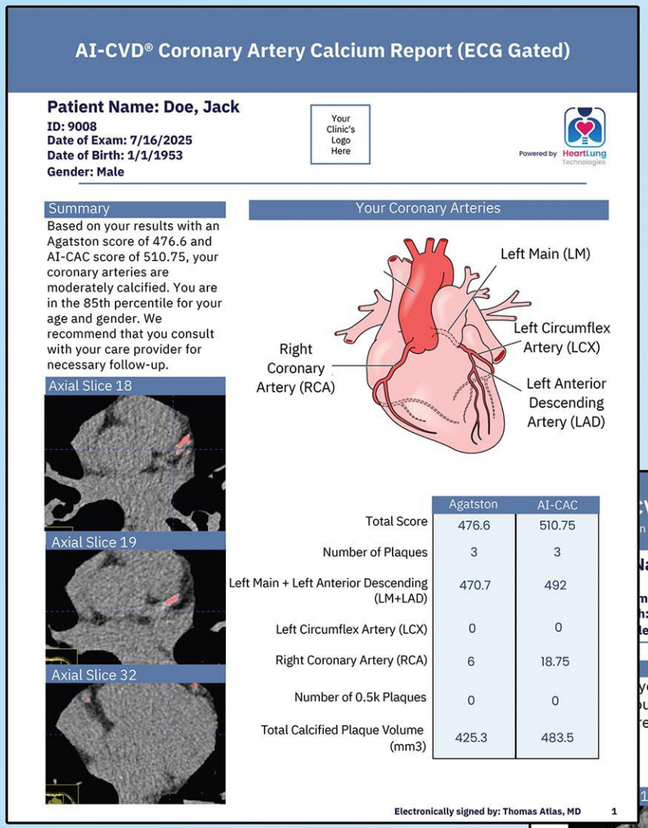
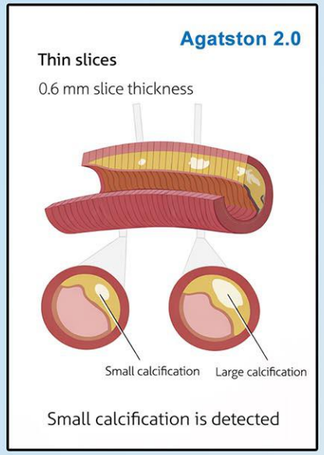


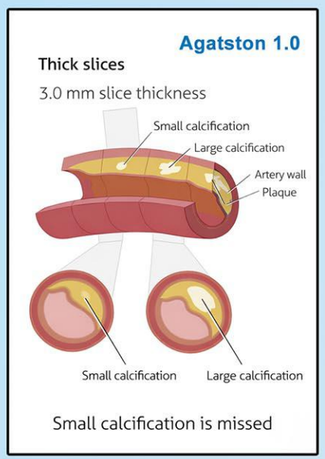
AutoLung™ is pending FDA clearance

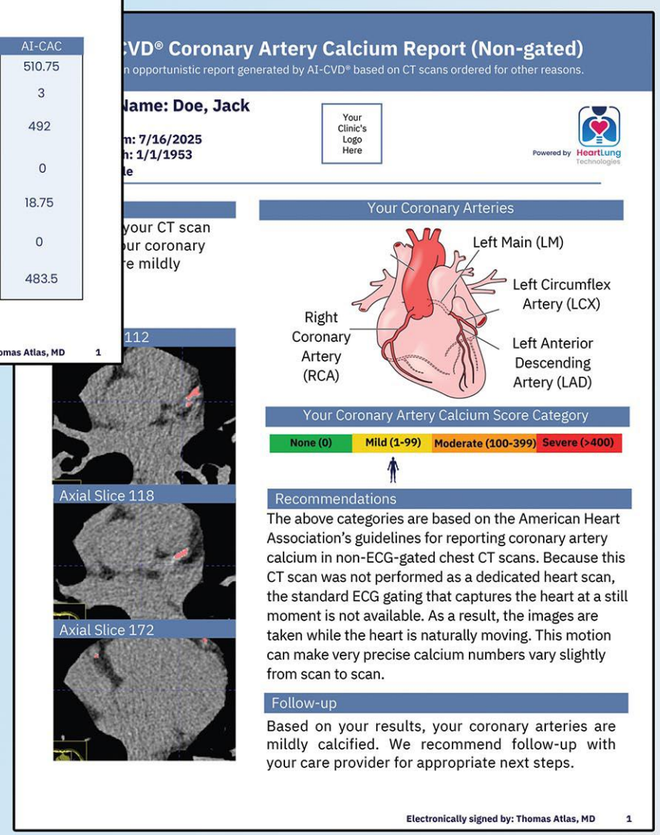
AI-CVD® Improves Patient Care and Bottom Line

Coronary Artery Calcification









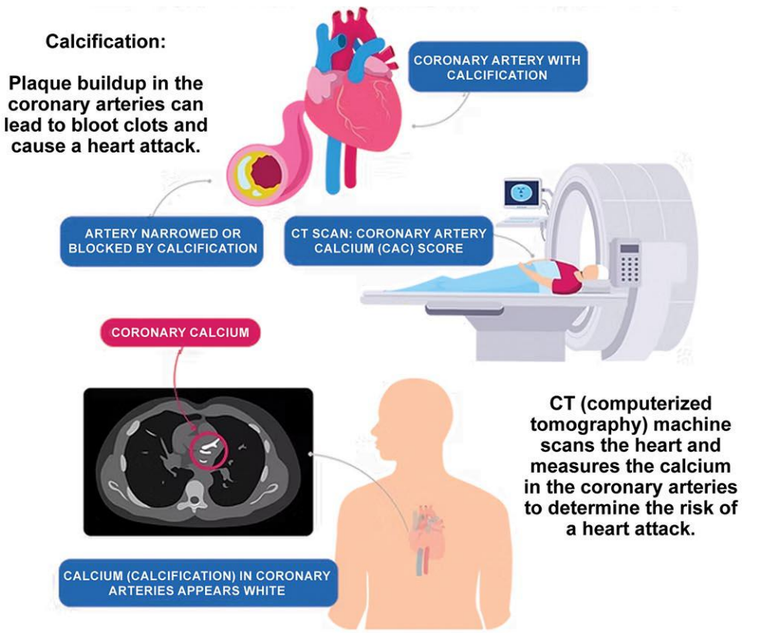
Introducing AutoCAC™ and AI-CAC®

A Calcium Score - also called a Coronary Artery Calcium (CAC) Score or Agatson Score- detects and measures any calcified plaque in the coronary arteries.

It is a highly specific marker for coronary atherosclerosis, and therefore is useful as a risk-stratification tool when assessing patients with chest pain. The greater the coronary calcium score, the larger the amount of plaque there is in the artery wall, and the greater the risk of a heart attack.

CAC is effective regardless of age, gender, and risk factor burden.

Coronary Artery Calcium (CAC) Score



AutoCAC™ (Automated Agatston 1.0)

AutoCAC is a fully automated implementation of the traditional Agatston coronary artery calcium score, effectively representing Agatston 1.0 at scale. It reproduces the conventional CAC methodology based on a fixed radiologic density threshold (≥130 HU) and minimum lesion size criteria on a 2.5-3 mm thick slice CT, while eliminating manual reader dependency. AutoCAC demonstrates near-perfect agreement with expert manual Agatston scoring, with negligible bias, excellent reproducibility, and equivalent cardiovascular outcome prediction across long-term follow-up. By standardizing coronary artery segmentation, plaque identification, and scoring across scanners and acquisition protocols, AutoCAC delivers fast, reproducible, and clinically equivalent Agatston scores suitable for population-level deployment and routine clinical workflows.

AI-CAC® (Automated Agatston 2.0)

AI-CAC represents the next generation of CAC quantification—Agatston 2.0—by moving beyond fixed thresholds to a continuous, spatially weighted, probabilistic assessment of coronary calcium burden. AI-CAC assigns voxel-level likelihoods of true calcification based on calibrated HU distributions and spatial context, enabling detection of small, borderline, or semi-calcified plaques that are systematically underestimated or missed by Agatston scoring. While maintaining strong correlation with manual Agatston scores, AI-CAC provides incremental prognostic value, particularly within individuals classified as CAC=0 by Agatston, significantly enhancing the "power of zero" without loss of specificity. In effect, AI-CAC preserves the clinical familiarity of CAC while upgrading it to a biologically continuous, AI-native metric better aligned with early atherosclerosis and long-term cardiovascular risk.

Thoracic Aortic and Valvular Calcification

AI-CVD® Thoracic Aortic Wall, Aortic Valve, and Mitral Valve Calcification Report

This is an opportunistic report generated by AI-CVD® software based on CT scans ordered for other reasons.

Patient Name: John Smith
ID: 000Z128002863B
Date of Exam: 08/12/2021
Date of Birth: 03/01/1947
Gender: Male

Your Clinic's Logo Here

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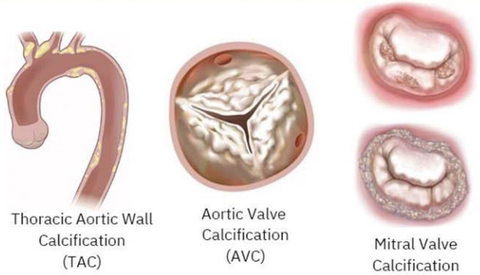
Valve Calcium Scores

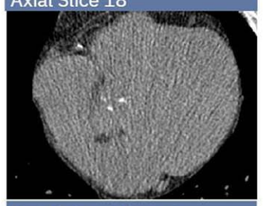
MVC Score	55
AVC Score	32

Thoracic Aortic Calcium Score

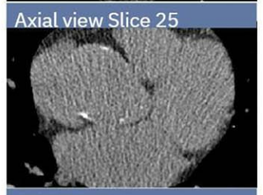
TAC Score	355.1



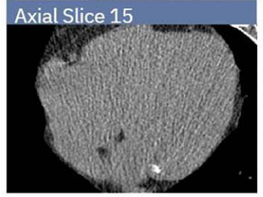
Axial Slice 18



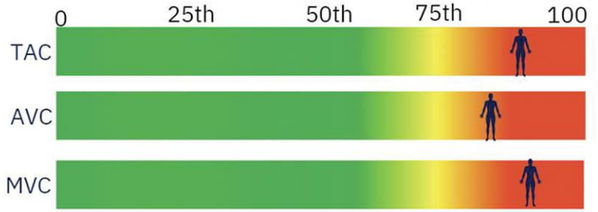
Axial view Slice 25



Axial Slice 15



Aortic and Mitral Valve Calcification Percentiles



Recommendations

The above percentiles are calculated based on your gender and BSA and referenced against NIH-sponsored Multi-Ethnic Study of Atherosclerosis (MESA) and Framingham Heart Study (FHS). It is important to note the colors are merely a reference to give a quantitative imaging impression of gender-based percentiles in the population. Colors and cut-offs are based on institutional settings and are not an indication for treatment. The actual risk must be evaluated based on your care provider's comprehensive assessment.

Follow-up

Calcification was identified in the thoracic aorta and in the aortic and mitral valves. Additional testing may be necessary based on clinical judgment.

Electronically signed by: Thomas Atlas, MD 1

Stroke and CVD Prediction

Thoracic Aortic Calcification (TAC) predicts stroke and CVD mortality with greater precision when combined with traditional risk factors. TAC, an often-overlooked finding in CAC scans, predicts stroke and CVD mortality with greater precision when combined with traditional risk factors. As a marker of systemic atherosclerosis, TAC enhances risk stratification for cerebrovascular events, broadening the utility of CAC scans.

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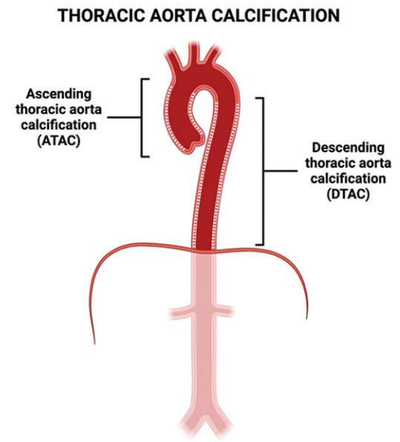
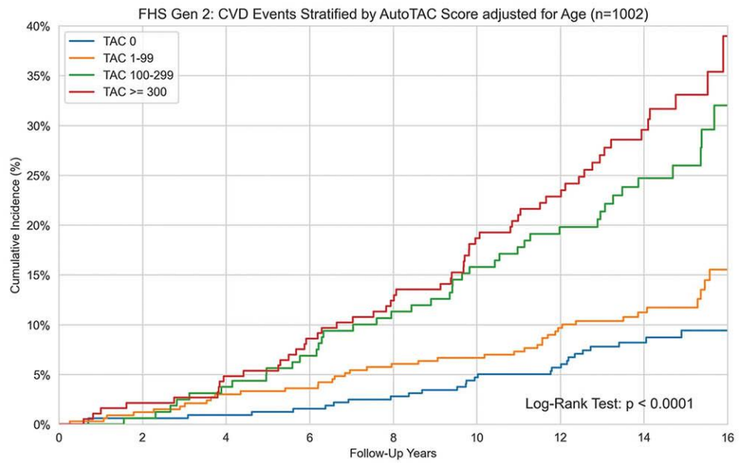
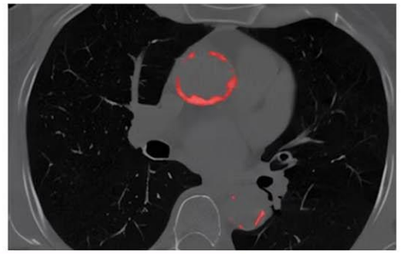


Enhanced Risk Stratification

The integration of TAC with traditional risk factors, such as hypertension, diabetes, and cholesterol levels, enhances the predictive accuracy for stroke and CVD mortality. HeartLung's AI-CVD® leverages advanced AI algorithms to combine TAC data with these risk factors, resulting in a comprehensive evaluation of a patient's cardiovascular risk profile. This approach facilitates early intervention and targeted treatment strategies, helping to identify high-risk individuals who may benefit from more aggressive management.





FHS Gen2: Framingham Heart Study Offspring (Second Generation)

Cardiac Chambers Volume

AI-CVD® Cardiac Chambers Volumetry Report

This is an opportunistic report generated by AI-CVD® based on CT scans ordered for other reasons.

Patient Name: Doe, Jack
ID: 9008
Date of Exam: 7/16/2025
Date of Birth: 1/1/1953
Gender: Male

Your Clinic's Logo Here

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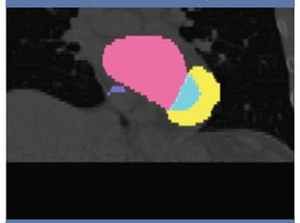
AutoChamber Volumetry

Chamber	Value	Percentile
LA	89.1 cc	96th
LV	121.6 cc	80th
RA	88.7 cc	58th
RV	131.8 cc	65th
LVM	118.5 g	90th
LA/RA	0.90	80th
LV/RV	0.75	74th

Cardio-Thoracic Ratio (CTR): 0.51

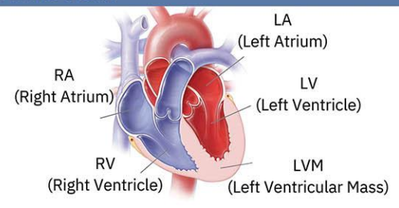
Coronal (Frontal View)

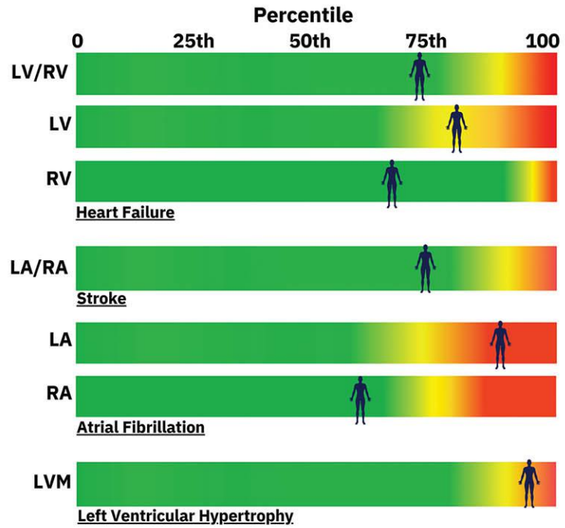


Sagittal (Lateral View)

Axial (Transverse View)

Chambers of the Heart





Your percentile is calculated based on published research literature from NIH-sponsored Multi-Ethnic Study of Atherosclerosis and Framingham Heart Study. Colors and cut-offs are based on institutional settings and are not an indication for treatment.

Recommendations

Enlarged cardiac chambers and increased LV mass are identified. Additional testing may be necessary based on clinical judgment. See the following pages for more information.

SERIES 202

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Benefits of AutoChamber®

Opportunistic Value Generator

AutoChamber® enables your imaging center to find life-threatening conditions in asymptomatic patients and generate revenue.

No Capital Investment Needed

Any diagnostic imaging center from anywhere in the world can sign up and start adding AutoChamber™ reports to any chest CT scans.

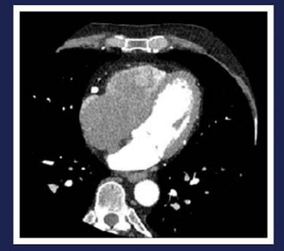
Simple and Easy Workflow Integration

Your practice can install the HeartLung gateway and receive AutoChamber® reports directly in your PACS. Your patients can access the report from HeartLung's web portal and mobile app.

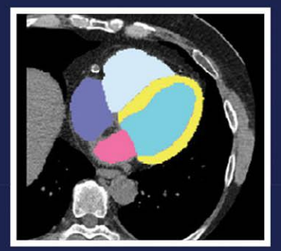
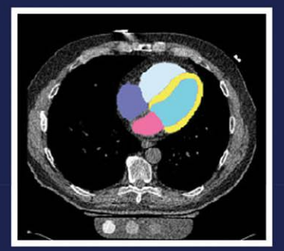
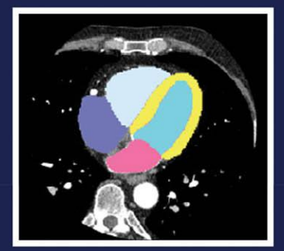
Rapid AI Turnaround Within Minutes

Receive rapid results within minutes of sending your scan to AutoChamber™ AI cloud. No training or learning curve is needed and no calibration phantom.

Before AutoChamber™

Coronary Artery Calcium Scan	LDCT Lung Cancer Screening Scan	Lung Diagnostic Scan	Coronary CT Angiography Scan
			

After AutoChamber™

Coronary Artery Calcium Scan	LDCT Lung Cancer Screening Scan	Lung Diagnostic Scan	Coronary CT Angiography Scan
			

Aorta & PA Size

AI-CVD® Aorta and Pulmonary Artery Report

This is an opportunistic report generated by AI-CVD® software based on CT scans ordered for other reasons

Patient Name: John Smith
ID: 000Z128002863B
Date of Exam: 08/12/2021
Date of Birth: 03/01/1947
Gender: Male

Your Clinic's Logo Here

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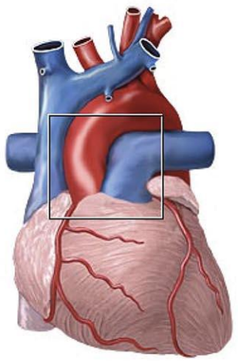
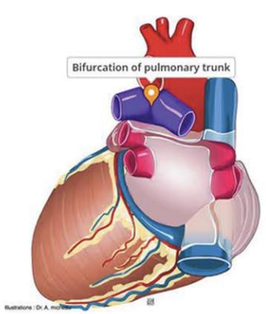
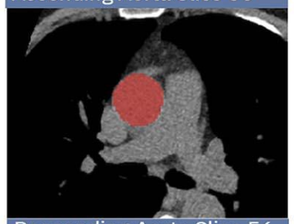
Measurements

Ascending Aorta Diameter	35.7 mm
Descending Aorta Diameter	33.2 mm
Pulmonary Artery Diameter	22.3 mm
Total Aorta Volume	179.4 cc
Pulmonary Artery Volume	58.8 cc

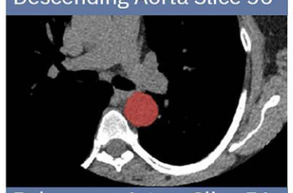




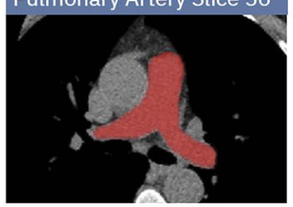
Ascending Aorta Slice 56



Descending Aorta Slice 56



Pulmonary Artery Slice 56



More Information

Aorta Diameter

- ≥ 40 mm is considered dilated and warrants further evaluation

Main Pulmonary Artery Diameter

- PA diameter ≥ 30 mm is considered dilated and warrants further evaluation.

Aorta and Pulmonary Artery Volume Percentiles

Recommendations

Based on your results and according to American Heart Association's guidelines, your measurements are considered **normal**.

Electronically signed by: Thomas Atlas, MD 1

The size of the aorta and pulmonary artery (PA) are key indicators of cardiovascular health. Changes in PA size can signal pulmonary hypertension or other vascular diseases.

Accurate measurement through imaging helps in early detection and management. An enlarged aorta can indicate conditions like aneurysm or dissection.

AI-CVD® uses advanced algorithms to measure these sizes, enhancing risk assessment and timely intervention for cardiovascular and pulmonary conditions.

Clinical Implications of Aorta and PA Size

The aorta gradually enlarges with age, but excessive dilation can signal underlying vascular disease.

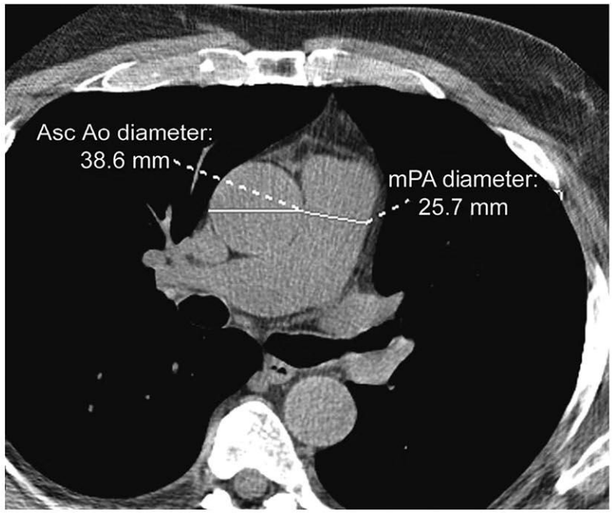
Enlargement of the ascending or descending aorta is associated with conditions such as hypertension, connective-tissue disorders, and aortic aneurysm.

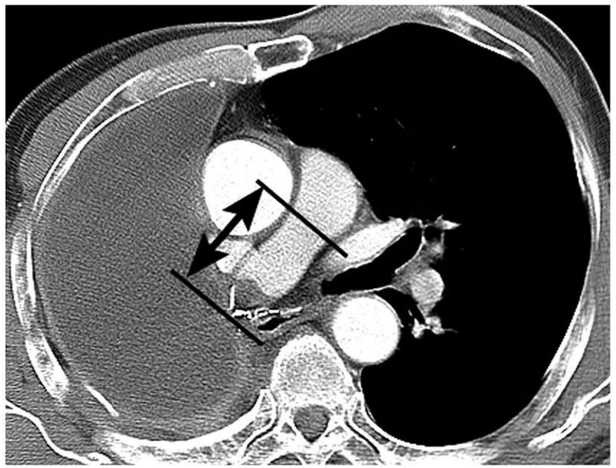
When the aorta reaches certain thresholds, the risk of complications — including dissection or rupture — increases significantly.

Routine measurement of aortic diameter on chest CT provides an important opportunity to identify patients with silent aortic enlargement.

Early recognition allows clinicians to implement risk-reducing strategies, such as optimized blood pressure control, lifestyle interventions, and timely referral to a specialist for further evaluation when warranted.

AI-CVD® quantifies these dimensions automatically, helping ensure that clinically important aortic enlargement is not overlooked.





Epicardial Fat

AI-CVD® Epicardial Fat Report

This is an opportunistic report generated by AI-CVD® software based on CT scans ordered for other reasons.

Patient Name: John Smith
ID: 000Z128002863B
Date of Exam: 08/12/2021
Date of Birth: 03/01/1947
Gender: Male

Your Clinic's Logo Here

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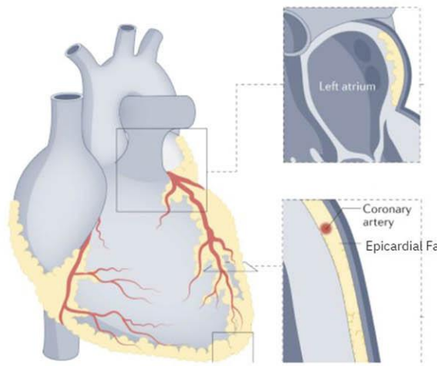
Your Measurements

Weight (lbs)	175
BSA (kg/m2)	1.9
Epicardial Fat Volume (cc)	110
Epicardial Fat Index	68.5

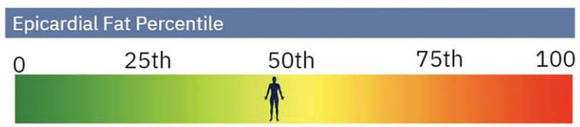


Sagittal (Lateral view)

Coronal (Frontal view)

Axial (Transverse view)

Epicardial Fat Percentile



Men:
- Normal: <125 cm³
- Elevated: ≥125–150 cm³
- High-risk: >150–200+ cm³

Women:
- Normal: <100 cm³
- Elevated: ≥100–125 cm³
- High-risk: >125–175+ cm³

Recommendations

The above percentiles are calculated based on your gender and BSA and referenced against NIH-sponsored Multi-Ethnic Study of Atherosclerosis (MESA) and Framingham Heart Study (FHS). It is important to note the colors are merely a reference to give a quantitative imaging impression of gender-based percentiles in the population. Colors and cut-offs are based on institutional settings and are not an indication for treatment. The actual risk must be evaluated based on your care provider's comprehensive assessment.

Follow up

Based on your results and according to American Heart Association's guidelines, your measurements are considered normal.

Electronically signed by: Thomas Atlas, MD 1

Aortic Quantification

AI-CVD® Aortic Quantification Report

This is an opportunistic report generated by AI-CVD® software based on CT scans ordered for other reasons.

Patient Name: John Smith
ID: 000Z128002863B
Date of Exam: 08/12/2021
Date of Birth: 03/01/1947
Gender: Male

Your Clinic's Logo Here

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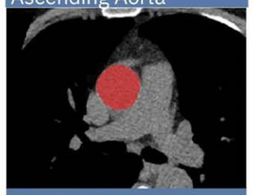
Aortic Diameters

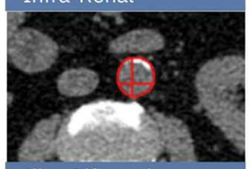
Ascending	45 mm
Descending	43 mm
Infra-Renal	38 mm
Iliac Bifurcation	23 mm

Ascending Aorta

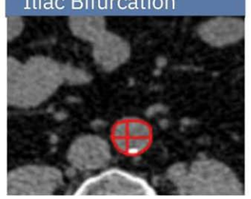


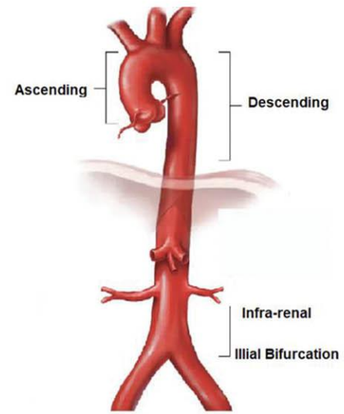
Descending Aorta

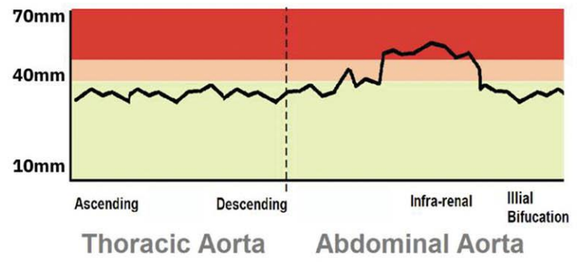
Infra-Renal



Iliac Bifurcation







Recommendations

Based on your results, your aortic measurements are considered **dilated** according to American Heart Association's guidelines and may be associated with aortic aneurysm. Consultation with your care provider is recommended.

Electronically signed by: Thomas Atlas, MD 1

Muscle & Visceral Fat

AI-CVD® Muscle and Fat Analysis Report

This is an opportunistic report generated by AI-CVD® software based on CT scans ordered for other reasons.

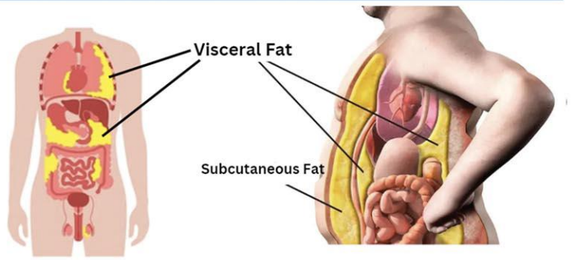
Patient Name: John Smith
ID: 000Z128002863B
Date of Exam: 08/12/2021
Date of Birth: 03/01/1947
Gender: Male

Your Clinic's Logo Here

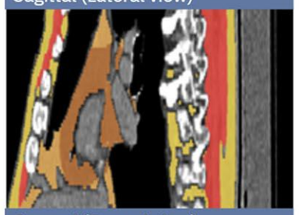
Powered by HeartLung Technologies

Current Measurements

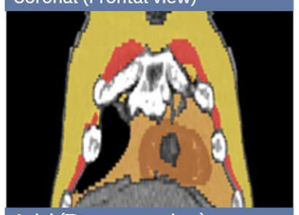
Weight (lbs)	175
BMI (kg/m2)	26.5
Muscle Mass (g)	1400
Muscle Density (HU)	28
Visceral Fat Mass (g)	260
Subcutaneous Fat Mass (g)	1543
Visceral-to-Subcutaneous Fat Ratio	1.3



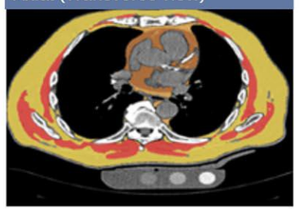
Sagittal (Lateral view)

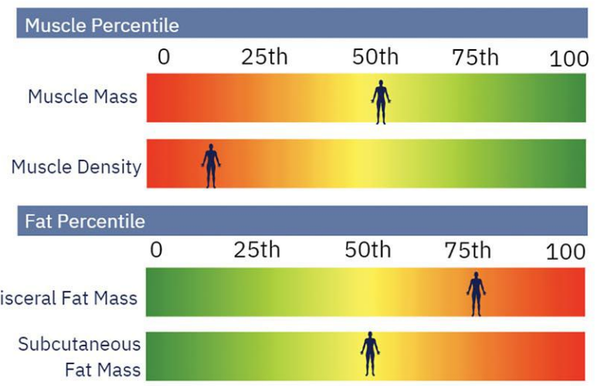


Coronal (Frontal view)



Axial (Transverse view)





Recommendations

The above percentiles are calculated based on your gender and BSA and referenced against NIH-sponsored Multi-Ethnic Study of Atherosclerosis (MESA) and Framingham Heart Study (FHS). It is important to note the colors are merely a reference to give a quantitative imaging impression of gender-based percentiles in the population. Colors and cut-offs are based on institutional settings and are not an indication for treatment. The actual risk must be evaluated based on your care provider's comprehensive assessment.

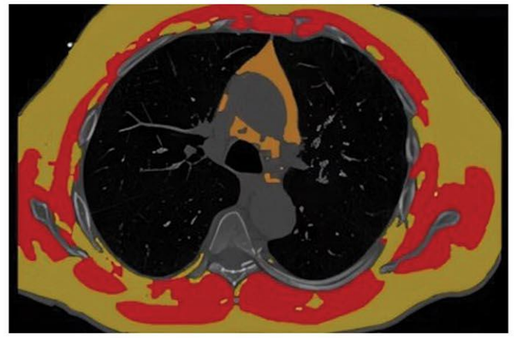
Follow up

Based on your results, your visceral fat mass is higher and your muscle density is lower than people in your age and sex category. Additional testing may be necessary based on clinical judgment.

Electronically signed by: Thomas Atlas, MD 1

Metabolic and Inflammatory Burden

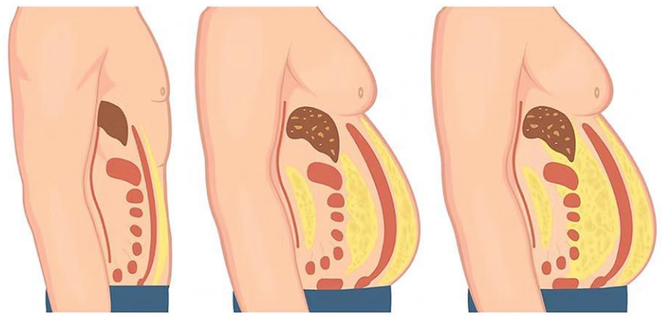
Visceral fat—a major driver of systemic inflammation and insulin resistance—is measurable in CAC scans. Increased visceral fat volume is a powerful predictor of metabolic syndrome, type 2 diabetes, and CVD. AI-CVD's ability to quantify visceral fat improves risk stratification for these conditions. Myosteatosis, characterized by fat infiltration into skeletal muscle, is an emerging biomarker of systemic metabolic dysfunction. AI-driven measurement of thoracic skeletal muscle density from CAC scans has shown strong predictive value for HF, AF, CHD), and all-cause mortality. Recent studies demonstrate that combining myosteatosis with CAC scores amplifies risk prediction, particularly for males, making it a critical addition to AI-CVD.



Enhanced Risk Stratification with AI-CVD®

HeartLung's AI-CVD® leverages advanced AI algorithms to quantify visceral fat and measure thoracic skeletal muscle density from CAC scans. This data, combined with CAC scores and traditional risk factors such as BMI, cholesterol levels, and blood pressure, enhances the predictive accuracy for metabolic and various cardiovascular conditions, particularly in males. The comprehensive quantitative evaluation provided by AI-CVD® enables early intervention and personalized treatment plans, helping to manage and mitigate the risks associated with high visceral fat volume, myosteatosis, and systemic metabolic dysfunction.

Visceral Body Fat

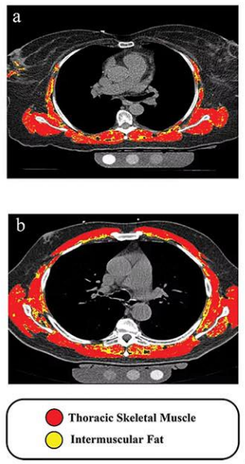


Case Example 1:
Age: 68
Sex: female
Smoking Status: Never smoker
AI-quantified Emphysema-like Lung Percentage: 0.28 %
AI-quantified Thoracic Skeletal Muscle Mean (HU): 26

This case diagnosed with COPD 12 years later

Case Example 2:
Age: 69
Sex: Male
Smoking Status: Never smoker
AI-quantified Emphysema-like Lung Percentage: 1.58 %
AI-quantified Thoracic Skeletal Muscle Mean (HU): 27.1

This case diagnosed with COPD 5 years later



Liver Fat

AI-CVD® Muscle and Fat Analysis Report

This is an opportunistic report generated by AI-CVD® based on CT scans ordered for other reasons.

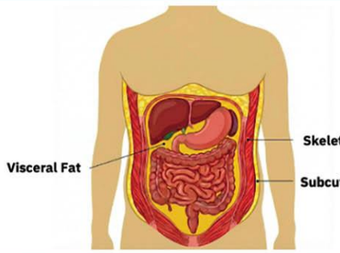
Patient Name: Doe, Jack
ID: 9008
Date of Exam: 7/16/2025
Date of Birth: 1/1/1953
Gender: Male

Your Clinic's Logo Here

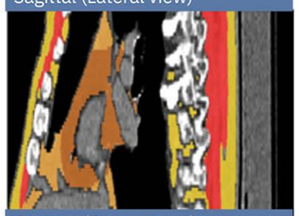
AutoFatMuscle® Powered by HeartLung Technologies

Current Measurements

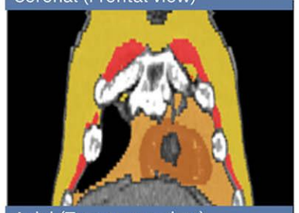
Weight (lbs)	175
BMI (kg/m2)	23.5
Muscle Mass (g)	430
Muscle Density (HU)	28
Visceral Fat Mass (g)	515
Subcutaneous Fat Mass (g)	563
Visceral-to-Subcutaneous Fat Ratio	0.9



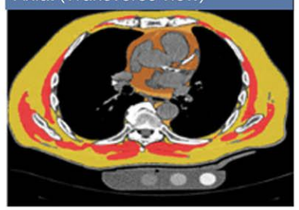
Sagittal (Lateral view)

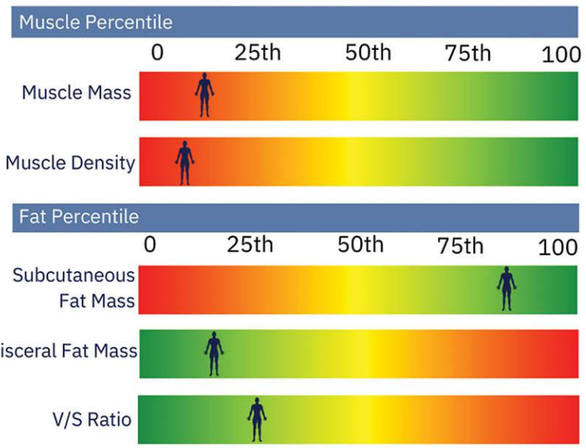


Coronal (Frontal view)



Axial (Transverse view)





The above percentiles are calculated based on your age and gender and referenced against 9,970 people across multiple studies sponsored by the National Institute of Health. It is important to note the colors are merely reference to give a quantitative imaging impression of gender-based percentile in the population.

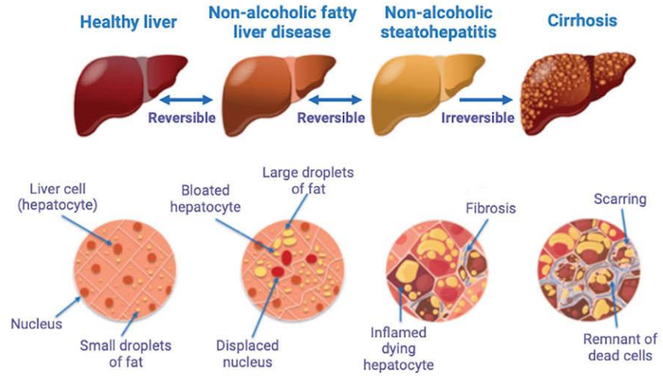
To protect metabolic health, implement balanced nutrition primarily consisting of whole, minimally processed foods, regular physical activity, and weight management.

Follow up

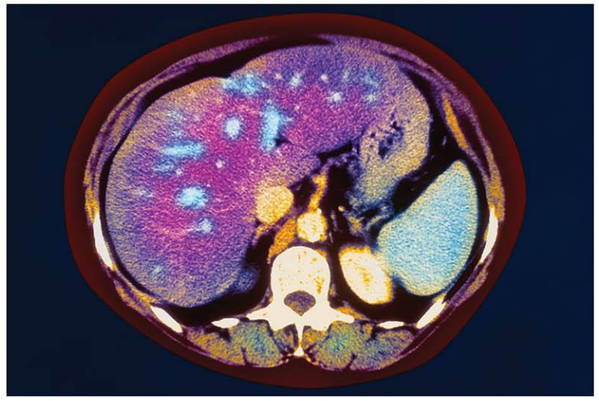
Based on your results, your your muscle mass and density is lower than people in your age and sex category. Additional testing may be necessary based on clinical judgment.

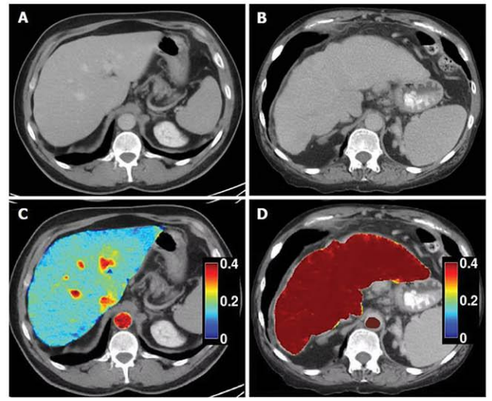
Electronically signed by: Thomas Atlas, MD 1

Fatty liver, also known as hepatic steatosis, is a condition characterized by the accumulation of fat in the liver cells. Detected opportunistically in coronary artery calcium (CAC) scans, fatty liver is a significant marker for metabolic syndrome, diabetes, and an increased risk of cardiovascular disease (CVD).

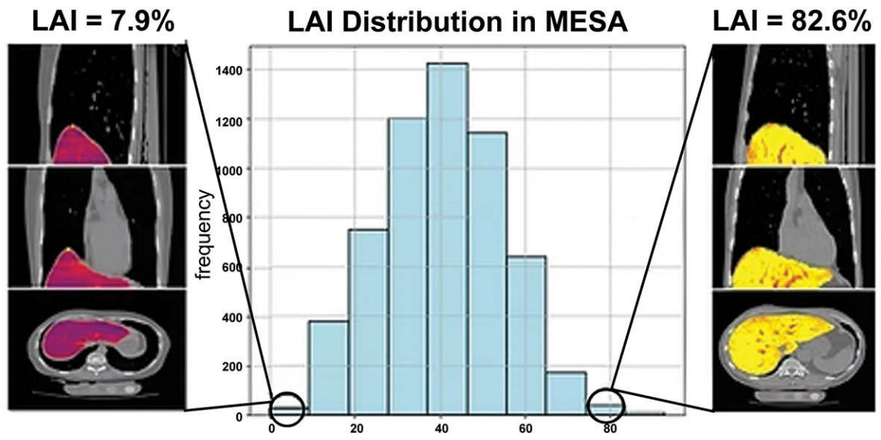


AI-CVD® leverages advanced imaging algorithms to quantify liver fat, providing a comprehensive assessment of an individual's cardiometabolic health.

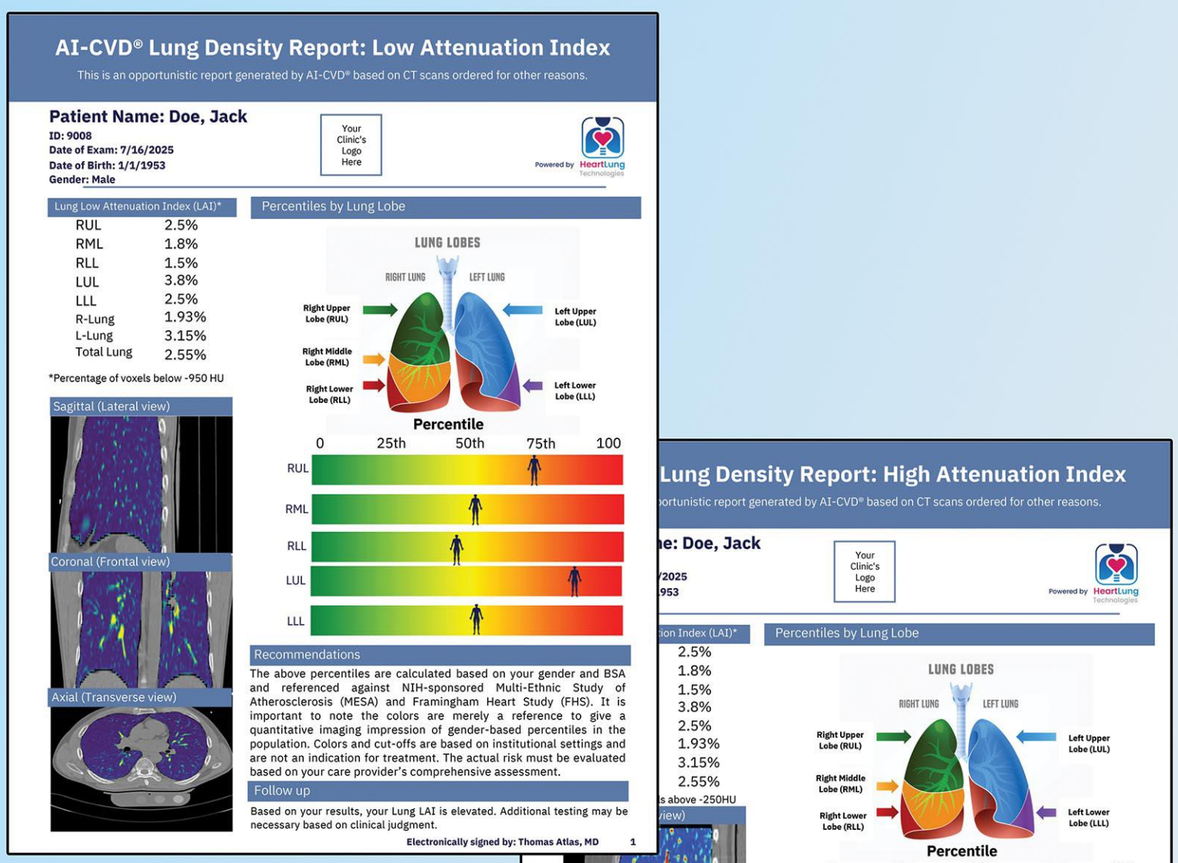




AI-enabled opportunistic measurement of liver steatosis in coronary artery calcium scans predicts cardiovascular events and all-cause mortality: an AI-CVD study within the Multi-Ethnic Study of Atherosclerosis (MESA)



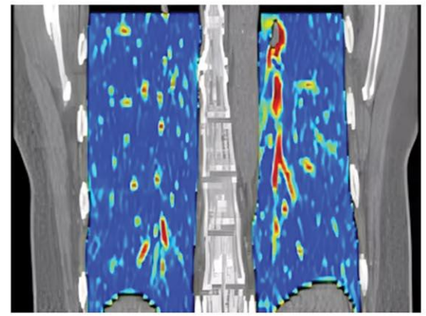
Emphysema & ILA



Integrating Pulmonary and Cardiovascular Health

The AI-CVD® initiative includes advanced emphysema scoring, highlighting the critical interplay between pulmonary and cardiovascular health.

By quantifying emphysema in lung scans, AI-CVD® provides valuable insights into the risks of chronic obstructive pulmonary disease (COPD) and atrial fibrillation (AF), fostering integrated care approaches.

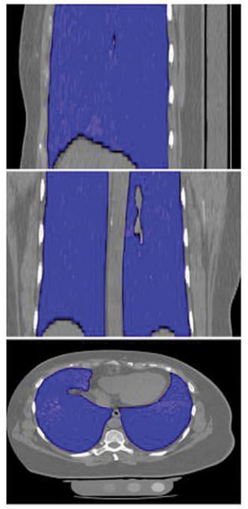


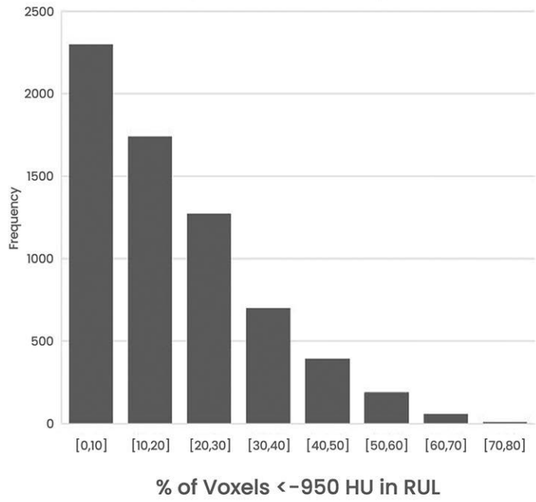
Emphysema Scoring in AI-CVD®

Emphysema is a chronic lung condition characterized by damage to the alveoli, leading to breathing difficulties and reduced oxygen exchange.

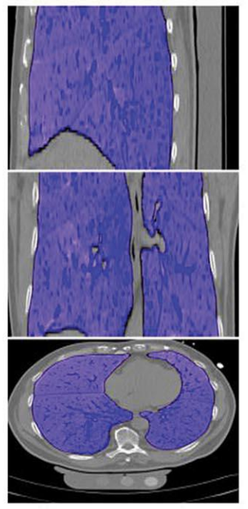
AI-CVD® utilizes advanced imaging algorithms to quantify emphysema in lung scans, providing a detailed assessment of lung health. This quantification is achieved by measuring the percentage of low attenuation areas (%LAA) in the lungs, which are indicative of emphysema severity.

Low Lung LAI
(Less Likely Emphysema)





High Lung LAI
(More Likely Emphysema)



Bone Density

AI-CVD® Bone Mineral Density (BMD) Report

Bone density measurements, percentiles, Z & T-scores are FDA-cleared. The osteoporosis risk estimate are added separately based on World Health Organization's (WHO) reference standards.

Patient Name: John Smith
ID: 000Z128002863B
Date of Exam: 08/12/2021
Date of Birth: 03/01/1947
Gender: Male

Your Clinic's Logo Here

Powered by HeartLung Technologies

Hounsfield Unit (HU)

A quantitative scale for describing radiodensity.

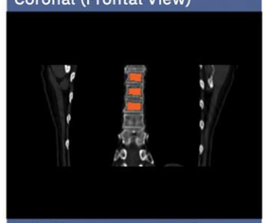
Vertebra 1	149.0
Vertebra 2	146.5
Vertebra 3	158.8
Mean HU	151.4

BMD (mg/cc)

Mean BMD	140.8
Z-Score	-0.3
T-Score	-2.3

Sagittal (Lateral View)

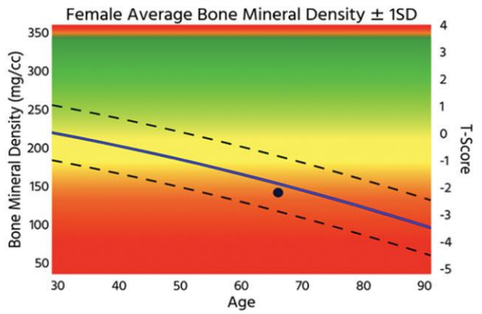
Coronal (Frontal View)



Axial (Transverse View)

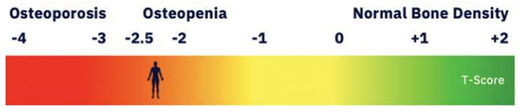
Your Z-Score -0.3

Z-Score compares your bone mineral density to what is expected for a person of the same age and gender.



Your T-Score -2.3

T-Score is your bone mineral density (BMD) compared with what is normally expected in a healthy adult of your gender. *Your T-Score of -2.3 indicates that you have low bone density (osteopenia).*



Recommendations

All patients should ensure an adequate intake of dietary calcium and vitamin D. The National Osteoporosis Foundation recommends adults under age 50 need 1,000 mg of calcium and 400-800 IU of vitamin D daily. Adults 50 and over need 1,200 mg of calcium and 800-1,000 IU of vitamin D daily. **Based on your BMD results, you have osteopenia and should seek follow up care with your physicians.**

Follow up

People diagnosed with osteoporosis or at high risk for fracture should have regular BMD tests. For patients eligible for Medicare, routine testing is allowed once every two years. For more information visit www.heartlung.ai/autobmd.

Electronically signed by: Thomas Atlas, MD 1

AutoBMD™ AI takes advantage of existing CT scans

AutoBMD reports Z-score and T-score similar to DEXA scans, and detects osteopenia and osteoporosis for prevention of future bone fractures.

Low Bone Density

It is a condition that causes bone mineral density to decline, increasing the risk of fractures.

How it's Detected

Bone density is usually measured using a DEXA scan or quantitative CT scan (QCT)

DEXA Scan **CT Scan**

AutoBMD uses QCT but does not require a new scan. It is superior to DEXA and regular scans and works on all CT scans (both existing and new scans). AutoBMD can be run on Coronary Artery Calcium Scans, Lung Cancer Screening Scans, and Thoracic & Abdominal Scans.

AI-CVD® Workflow

Chest CT or CAC scan acquired for reasons other than cardiac volumetry

Chest CT chest scan or CAC uploaded to PACS

*Coronary Artery Calcium (CAC)

AI-CVD® is installed in PACS with a DICOM Node and receives DICOM files

AI-CVD® flags cases with values that exceed the cut-off for further investigation.

No

AI-CVD® reports are provided along with general information on CVD risk assessment

Yes

Physician is alerted.

Physician advices on the next step based on patient's history, clinical evaluation and other information. Provider may order **electrocardiography (ECG), echocardiography,** or other diagnostic tests

For Example

*See next page

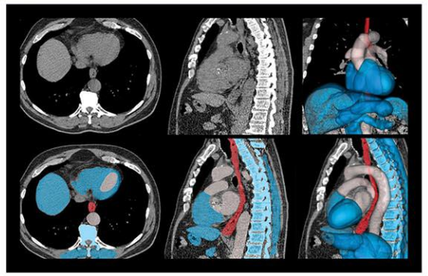
Enlarged LA Differential Diagnosis

For example, enlarged LA has the following differential diagnoses known to cardiologists:

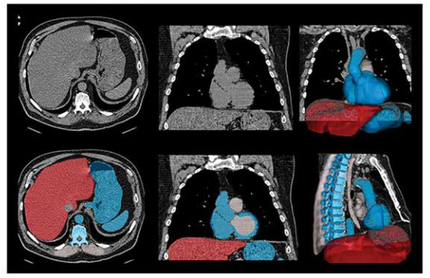
- Atrial fibrillation
- Systolic heart failure (HFrEF)
- Diastolic heart failure (HFpEF)
- Mitral stenosis
- Mitral regurgitation
- Pulmonary hypertension w/ left heart disease
- Aortic stenosis
- Dilated cardiomyopathy
- Pericardial disease
- Left ventricular hypertrophy, cardiac amyloidosis, and other cardiomyopathies.
- Athlete's heart

AI-CVD® FDA-Cleared Indications for Use

Abbreviations



AAO: Ascending Aorta
AVC: Aortic Valve Calcification
CAC: Coronary Artery Calcium
EAT: Epicardial Adipose Tissue
LA: Left Atrium
Liver LAI%: Liver Low Attenuation Index
LV: Left Ventricle
LVW: Left Ventricular Wall



MVC: Mitral valve Calcification
PA: Pulmonary Artery
RA: Right Atrium
RV: Right Ventricle
TAC: Thoracic Aortic Calcification
VAT: Visceral Adipose Tissue
SAT: Subcutaneous Adipose Tissue

AI-CVD® FDA-Cleared Indications for Use:

AI-CVD® is an opportunistic AI-powered quantitative imaging tool that provides automated CT-derived anatomical and density-based measurements for clinician review. The device does not provide diagnostic interpretation or risk prediction. It is solely intended to aid physicians and other healthcare providers in determining whether additional diagnostic tests are appropriate for implementing preventive healthcare plans. The software has a modular structure where each module is intended to report quantitative imaging measurements for each specific component of the CT scan. AI-CVD® quantitative imaging measurement modules include coronary artery calcium (CAC) score, aortic wall calcium score, aortic valve calcium score, mitral valve calcium score, cardiac chambers volumetry, epicardial fat volumetry, aorta and pulmonary artery sizing, lung density, liver density, bone mineral density, and muscle & fat composition.

Using AI-CVD® quantitative imaging measurements and their clinical evaluation, healthcare providers can investigate patients who are unaware of their risk of heart failure, atrial fibrillation, stroke, osteoporosis, liver steatosis, diabetes, and other adverse health conditions that may warrant additional risk assessment, monitoring or follow-up. AI-CVD® quantitative imaging measurements are to be reviewed by radiologists or other medical professionals and should only be used by healthcare providers in conjunction with clinical evaluation.

AI-CVD® is not intended to rule out the risk of cardiovascular diseases. AI-CVD® opportunistic screening software can be applied to non-contrast thoracic CT scans such as those obtained for CAC scans, lung cancer screening scans, and other chest diagnostic CT scans. Similarly, AI-CVD opportunistic screening software can be applied to contrast-enhanced CT scans such as coronary CT angiography (CCTA) and CT pulmonary angiography (CTPA) scans. AI-CVD® opportunistic bone density module and liver density module can be applied to CT scans of the abdomen and pelvis. All volumetric quantitative imaging measurements from the AI-CVD® opportunistic screening software are adjusted by body surface area (BSA) and reported both in cubic centimeter volume (cc) and percentiles by gender reference data from people who participated in the Multi-Ethnic Study of Atherosclerosis (MESA) and Framingham Heart Study (FHS). Except for coronary artery calcium scoring, other AI-CVD® modules should not be ordered as a standalone CT scan but instead should be used as an opportunistic add-on to existing and new CT scans.

Electronically signed by: Thomas Atlas, MD **1**

AUTOCHAMBER EDUCATION

An example of a customized AI-CVD cardiac chambers anaylsis according to an institution's desired cut-off values and patient education content

AI-CVD® Cardiac Chambers Volumetry Report

This is an opportunistic report generated by AI-CVD® based on CT scans ordered for other reasons.

Patient Name: Doe, Jack
ID: 9008
Date of Exam: 7/16/2025
Date of Birth: 1/1/1953
Gender: Male

Your Clinic's Logo Here

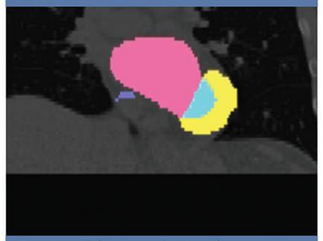
Powered by HeartLung Technologies

AutoChamber Volumetry

Chamber	Value	Percentile
LA	89.1 cc	96th
LV	121.6 cc	80th
RA	88.7 cc	58th
RV	131.8 cc	65th
LVM	118.5 g	90th
LA/RA	0.90	80th
LV/RV	0.75	74th

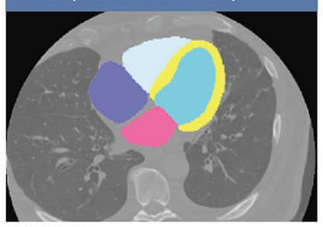
Cardio-Thoracic Ratio (CTR): 0.51

Coronal (Frontal View)



Sagittal (Lateral View)

Axial (Transverse View)



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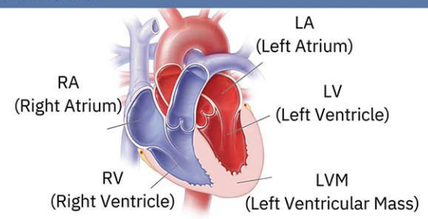
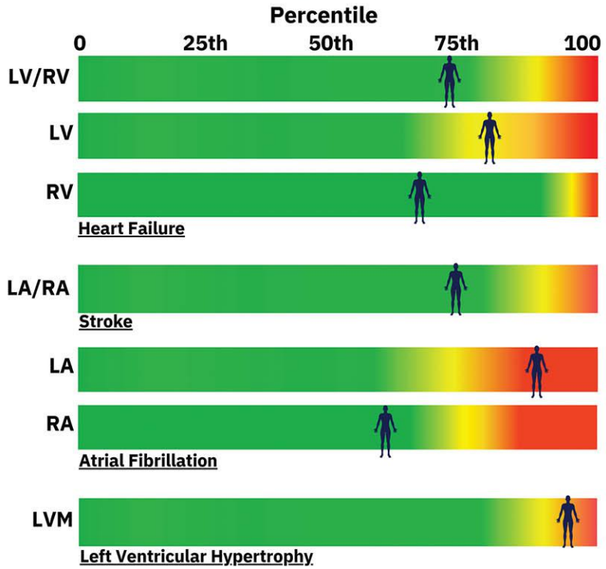
Chambers of the Heart





Your percentile is calculated based on published research literature from NIH-sponsored Multi-Ethnic Study of Atherosclerosis and Framingham Heart Study. Colors and cut-offs are based on institutional settings and are not an indication for treatment.

Recommendations

Enlarged cardiac chambers and increased LV mass are identified. Additional testing may be necessary based on clinical judgment. See the following pages for more information.

Electronically signed by: Thomas Atlas, MD 1

About Cardiac Chambers & Cardiovascular Disease

HeartLung Technologies

FDA Approved AutoChamber™ AI as a "Breakthrough" Medical Device with the Following Indication for Use:

"The AutoChamber software is an opportunistic AI-powered quantitative imaging tool that measures and reports cardiac chambers volumes comprising left atrium (LA), left ventricle (LV), right atrium (RA), right ventricle (RV), and left ventricular wall (LVW) from non-contrast chest CT scans including coronary artery calcium (CAC) scans and lung CT scans. AutoChamber is not intended to rule out the risk of a cardiovascular disease, and the results should not be used for any purpose other than to enable physicians to investigate patients that AutoChamber shows signs of enlarged heart (cardiomegaly), enlarged cardiac chambers, and left ventricular hypertrophy (LVH) whose conditions are otherwise missed by human eyes in non-contrast chest CT scans. AutoChamber similarly measures and reports LA, LV, RA, RV, and LVW in contrast-enhanced coronary CT angiography (CCTA) scans. Additionally, AutoChamber measures and reports cardiothoracic ratio (CTR) in both contrast and non-contrast CT scans where the entire thoracic cavity is in the axial field of view. AutoChamber quantitative imaging measurements are adjusted by body surface area (BSA) and are reported both in cubic centimeter volume (cc) and percentiles by gender using reference data from 5830 people who participated in the Multi-Ethnic Study of Atherosclerosis (MESA). AutoChamber should not be ordered as a standalone CT scan but instead should be used as an opportunistic add-on to existing and new CT scans of the chest, such as CAC and lung CT scans, as well as CCTA scans.
Using AutoChamber quantitative imaging measurements and their clinical evaluation, healthcare providers can investigate asymptomatic patients who are unaware of their risk of heart failure, atrial fibrillation, stroke and other life-threatening conditions associated with enlarged heart, enlarged cardiac chambers, and LVH that may warrant additional risk-assessment or follow-up. AutoChamber quantitative imaging measurements are to be reviewed by radiologists or other medical professionals and should only be used by healthcare providers in conjunction with clinical evaluation."
https://www.accessdata.fda.gov/cdrh_docs/pdf24/K240786.pdf

References for Percentiles, Colors, and Cut-offs

This report uses LA and RA volumes for future risk of atrial fibrillation, LV volume, RV volume and LV/RV ratio for heart failure, and LA/RA volume ratio for stroke. See below:

Male

LV/RV Ratio Percentile Cutoffs

Incidence of Heart Failure Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 91st percentile
5 to 20 in 100 people	Yellow	91st to 98th percentile
> 20 in 100 people	Red	>98th percentile

Left Ventricular (LV) Volume Percentile Cutoffs

Incidence of Heart Failure Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 84th percentile
5 to 20 in 100 people	Yellow	84th to 95th percentile
> 20 in 100 people	Red	>95th percentile

Right Ventricular (RV) Volume Percentile Cutoffs

Incidence of Heart Failure Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 95th percentile
5 to 20 in 100 people	Yellow	95th to 99th percentile
> 20 in 100 people	Red	>99th percentile

LA/RA Ratio Percentile Cutoffs

Incidence of Stroke Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 94th percentile
5 to 20 in 100 people	Yellow	94th to 96th percentile
> 20 in 100 people	Red	>96th percentile

Left Atrial (LA) Volume Percentile Cutoffs

Incidence of Atrial Fibrillation Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 65th percentile
5 to 20 in 100 people	Yellow	65th to 79th percentile
> 20 in 100 people	Red	>79th percentile

Right Atrial (RA) Volume Percentile Cutoffs

Incidence of Atrial Fibrillation Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 66th percentile
5 to 20 in 100 people	Yellow	66th to 82th percentile
> 20 in 100 people	Red	>82th percentile

Left Ventricular Mass (LVM) Percentile Cutoffs

Left Ventricular Hypertrophy Suspected	Color	Percentile Range
Equivalent to CMRI LVMi < 100g/m2 BSA	Green	< 90th percentile
Equivalent to CMRI LVMi 100 to 115g/m2 BSA	Yellow	90th to 98th percentile
Equivalent to CMRI LVMi > 115g/m2 BSA	Red	>98th percentile

**CMRI (Cardiac Magnetic Resonance Imaging)*

Female

LV/RV Ratio Percentile Cutoffs

Incidence of Heart Failure Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 92nd percentile
5 to 20 in 100 people	Yellow	92nd to 99th percentile
> 20 in 100 people	Red	>99th percentile

Left Ventricular (LV) Volume Percentile Cutoffs

Incidence of Heart Failure Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 93rd percentile
5 to 20 in 100 people	Yellow	93rd to 99th percentile
> 20 in 100 people	Red	>99th percentile

Right Ventricular (RV) Volume Percentile Cutoffs

Incidence of Heart Failure Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 95th percentile
5 to 20 in 100 people	Yellow	95th to 99th percentile
> 20 in 100 people	Red	>99th percentile

LA/RA Ratio Percentile Cutoffs

Incidence of Stroke Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 95th percentile
5 to 20 in 100 people	Yellow	95th to 99th percentile
> 20 in 100 people	Red	>99th percentile

Left Atrial (LA) Volume Percentile Cutoffs

Incidence of Atrial Fibrillation Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 79th percentile
5 to 20 in 100 people	Yellow	79th to 90th percentile
> 20 in 100 people	Red	>90th percentile

Right Atrial (RA) Volume Percentile Cutoffs

Incidence of Atrial Fibrillation Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 79th percentile
5 to 20 in 100 people	Yellow	79th to 96th percentile
> 20 in 100 people	Red	>96th percentile

Left Ventricular Mass (LVM) Percentile Cutoffs

Left Ventricular Hypertrophy Suspected	Color	Percentile Range
Equivalent to CMRI LVMi < 80g/m2 BSA	Green	< 91st percentile
Equivalent to CMRI LVMi 80 to 95g/m2 BSA	Yellow	91th to 98th percentile
Equivalent to CMRI LVMi > 95g/m2 BSA	Red	>98th percentile

**CMRI (Cardiac Magnetic Resonance Imaging)*

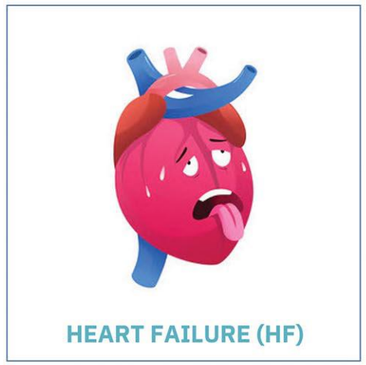
The above percentiles and risk estimates are calculated based on data from participants in NIH-sponsored Multi-Ethnic Study of Atherosclerosis and Framingham Heart Study who were followed for over 10 years. 2

About Cardiac Chambers & Cardiovascular Disease

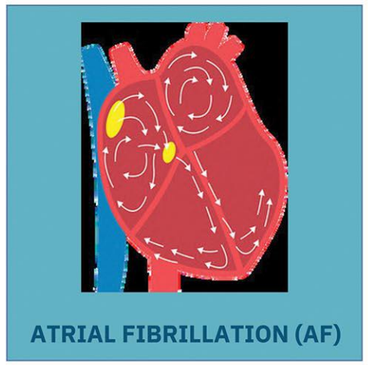
HeartLung Technologies

Introduction

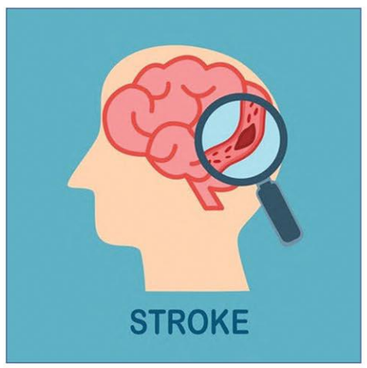
Cardiovascular disease (CVD) remains the leading cause of morbidity and mortality worldwide, and four key conditions—heart failure (HF), left ventricular hypertrophy (LVH), stroke, and atrial fibrillation (AF)—represent critical targets for prevention and early detection. Heart failure, a terminal stage of many cardiac disorders, often evolves silently from LVH and enlarged cardiac chambers, which reflects chronic pressure overload and are a powerful predictor of adverse outcomes. Early identification of enlarged chambers and LVH can enable timely intervention to halt progression to HF. Similarly, stroke, a major cause of disability, is frequently preceded by undiagnosed or asymptomatic AF, an irregular heart rhythm that increases thromboembolic (blood clot) risk fivefold. AF is often silent, yet it underlies nearly one-third of ischemic strokes. Detecting individuals with enlarged chambers and LVH before the onset of HF, AF, or stroke offers a vital opportunity to intervene earlier and reduce the burden of catastrophic CVD events. Therefore, proactive and opportunistic screening for these precursors is essential for effective cardiovascular risk management and improved population health.



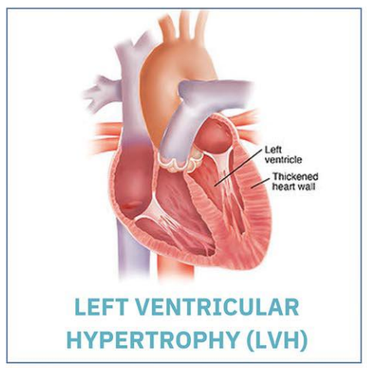
HEART FAILURE (HF)



ATRIAL FIBRILLATION (AF)



STROKE



LEFT VENTRICULAR HYPERTROPHY (LVH)

About Cardiac Chambers & Cardiovascular Disease

HeartLung Technologies

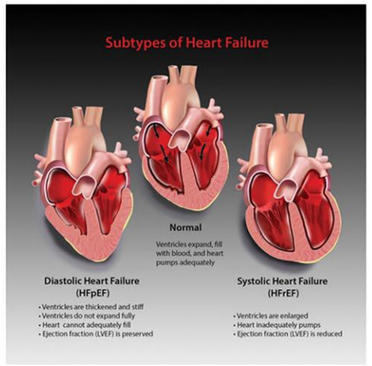
About Heart Failure (HF)

Heart failure occurs when your heart doesn't pump blood as effectively as it should, causing fluid buildup and fatigue. It can affect daily activities and quality of life. Early diagnosis leads to treatments that dramatically improve quality of life.

In the U.S., over 6.7 million are affected by Heart Failure (HF), with numbers projected to reach 8 million by 2030, leading to healthcare costs of over $53 billion.

How Common is Undiagnosed HF?

Undiagnosed heart failure is surprisingly common, especially in early stages. Up to half of patients with mild symptoms may not realize they have heart failure, attributing tiredness or breathing difficulty to aging or fitness issues.



Dangers of Undiagnosed HF

- Shortness of breath and fatigue, impacting daily life
- Swelling of ankles, legs, or abdomen
- Increased risk of hospitalization due to fluid buildup
- Reduced life expectancy without treatment
- Higher risk of sudden cardiac death and stroke

HF Risk Factors

- High blood pressure (hypertension)
- Coronary artery disease
- Diabetes
- Obesity
- History of heart attacks
- Chronic kidney disease
- Excessive alcohol use
- Older age (>65 years)

Detecting and Managing HF

- Early detection through screening can significantly improve your quality of life and reduce the risk of severe health consequences.
- Diagnosis involves echocardiograms, blood tests, and regular check-ups. Effective management includes medications, lifestyle adjustments (low salt, exercise), and occasionally medical devices like pacemakers.

About Cardiac Chambers & Cardiovascular Disease

HeartLung Technologies

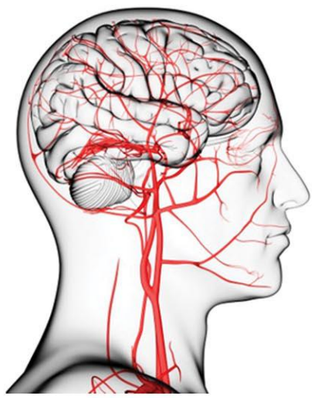
About Stroke

A stroke happens when blood flow to the brain is blocked or a blood vessel ruptures, causing brain damage. It can lead to permanent disabilities or death if not treated quickly.

The combined direct and indirect annual costs of stroke are expected to reach approximately $240.67 billion by 2030, marking a 129% increase from 2010 levels. By 2030, approximately 3.88% of U.S. adults over 18 years of age are projected to have experienced a stroke.

How Common is Undiagnosed Stroke?

Estimates suggest that between 2% to 3% of Americans experience a silent stroke each year. Unlike typical strokes, silent strokes occur without obvious signs, making them challenging to detect without medical imaging.



Dangers of Undiagnosed Stroke

- Sudden and permanent paralysis or muscle weakness
- Severe speech or vision difficulties
- Memory loss and cognitive impairment
- Loss of independence and mobility
- Higher risk of repeated strokes

Stroke Risk Factors

- High blood pressure
- Atrial fibrillation (irregular heartbeat)
- Diabetes
- High cholesterol
- Smoking
- Family history of stroke
- Sedentary lifestyle and obesity
- Previous stroke or cardiovascular disease

Detecting and Managing Stroke Early

- Early detection through screening can detect risk of stroke and reduce the risk of severe health consequences.
- Routine medical checkups, ECGs for AF, carotid artery imaging, and blood tests identify stroke risks early. Effective management includes medications, lifestyle changes, and timely treatment of identified conditions.

5

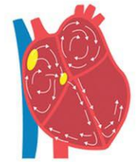
About Cardiac Chambers & Cardiovascular Disease

HeartLung Technologies

About Atrial Fibrillation (AF)

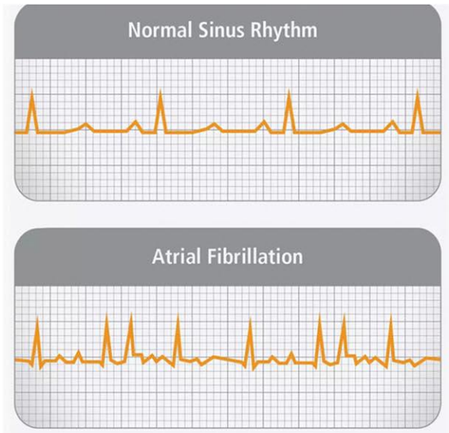
Atrial fibrillation is a common heart rhythm disorder affecting millions of people worldwide. AF occurs when the upper chambers of the heart, called the atria, beat irregularly and rapidly.

In the U.S., over 10.5 million are affected by Atrial Fibrillation (AF), with numbers projected to reach 12.1 million by 2030, leading to healthcare costs of over $40 billion.



How Common is Undiagnosed AF?

Around 1 in every 4 adults over the age of 40 will experience AF at some point. Studies suggest up to 30-40% of people with AF may not even realize they have it.



Dangers of Undiagnosed AF

- Increased hospitalizations
- Increased risk of stroke
- Reduced quality of life due to persistent symptoms like fatigue, dizziness, shortness of breath, and palpitations
- Higher risk of dementia due to reduced blood flow to the brain over time

AF Risk Factors

- Age: Incidence rises sharply after age 65
- Hypertension (high blood pressure)
- Structural heart disease: valvular disease, prior myocardial infarction, heart failure
- Obesity, diabetes, sleep apnea
- Hyperthyroidism
- Excessive alcohol or stimulant use

Detecting and Managing AF Early

- Early detection through screening or wearable devices can significantly improve your quality of life and reduce the risk of severe health consequences.
- Treatment options include medications to control heart rhythm, blood thinners to prevent strokes, and lifestyle changes to improve overall heart health.

6

AI-CVD® Publications

AI-CVD Publications:

1. Naghavi M, Reeves AP, Atlas K, Zhang C, Atlas T, Henschke CI, Yankelevitz DF, Budoff MJ, Li D, Roy SK, Nasir K, Molloi S, Fayad Z, McConnell MV, Kakadiaris I, Maron DJ, Narula J, Williams K, Shah PK, Levy D, Wong ND. **Artificial intelligence applied to coronary artery calcium scans (AI-CAC) significantly improves cardiovascular events prediction.** NPJ Digit Med. 2024 Nov 5;7(1):309. doi: 10.1038/s41746-024-01308-0. PMID: 39501071; PMCID: PMC11538462.

2. Naghavi M, Atlas K, Jaberzadeh A, Zhang C, Manubolu V, Li D, et al. **Validation of opportunistic artificial intelligence-based bone mineral density measurements in coronary artery calcium scans.** Journal of the American College of Radiology. 2024;21(4):624–32.

3. Naghavi M, De Oliveira I, Mao SS, Jaberzadeh A, Montoya J, Zhang C, et al. **Opportunistic AI-enabled automated bone mineral density measurements in lung cancer screening and coronary calcium scoring CT scans are equivalent.** European Journal of Radiology Open. 2023;10:100492.

4. Naghavi M, Yankelevitz D, Reeves AP, Budoff MJ, Li D, Atlas K, et al. **AI-enabled left atrial volumetry in coronary artery calcium scans (AI-CACTM) predicts atrial fibrillation as early as one year, improves CHARGE-AF, and outperforms NT-proBNP: The multi-ethnic study of atherosclerosis. Journal of cardiovascular computed tomography.** 2024;18(4):383–91.

5. Naghavi M, Reeves A, Budoff M, Li D, Atlas K, Zhang C, et al. **AI-enabled cardiac chambers volumetry in coronary artery calcium scans (AI-CACTM) predicts heart failure and outperforms NT-proBNP: the multi-ethnic study of atherosclerosis.** Journal of cardiovascular computed tomography. 2024;18(4):392–400.

6. Naghavi M, Reeves AP, Atlas KC, Zhang C, Li D, Atlas T, et al. **AI-Enabled CT Cardiac Chamber Volumetry Predicts Atrial Fibrillation and Stroke Comparable to MRI.** JACC: Advances. 2024;3(11):101300.

7. Naghavi M, Atlas K, Reeves A, Zhang C, Wasserthal J, Atlas T, et al. **AI-enabled opportunistic measurement of liver steatosis in coronary artery calcium scans predicts cardiovascular events and all-cause mortality: an AI-CVD study within the Multi-Ethnic Study of Atherosclerosis (MESA). BMJ Open Diabetes Research & Care.** 2025;13(2).

8. **Naghavi M, Atlas K, Reeves AP, et al. AI-enabled opportunistic left ventricular volumetry in coronary artery calcium scans predicts heart failure comparably to cardiac MRI: An AI-CVD study with the Multi-Ethnic Study of Atherosclerosis (MESA).** J Cardiovasc Comput Tomogr. Published online July 24, 2025. doi:10.1016/j.jcct.2025.07.004

Under Review for Publication

9. Naghavi M, Azimi A, Atlas K, Reeves AP, Zhang C, Mirjalili SR, Mozafarybazargany M, Ghaffari Jolfayia A, Hashemi A, Atlas T, Wasserthal J[c], Vliegenthart R, Henschke CI, Yankelevitz DF, Branch AD, Roy SK, Rana RS, Fayad[i] ZA, Nieman K, Narula J, Williams KA, Shah PK, Mehran R, Raggi P, Maron DJ, McConnell MV, Kloner RA, Budoff MJ, Wong ND, Agatston A. **Agatston 2.0: A Next-Generation AI-Based Coronary Calcium Quantification Approach to Improve Risk Stratification Among Individuals with Zero Agatston Scores. An AI-CVD Study within the Multi-Ethnic Study of Atherosclerosis and Framingham Heart Study**

10. Naghavi M, Azimi A, Atlas K, Reeves AP, Zhang C, Wasserthal J, Mirjalili SR, Mozafarybazargany M, Hashemi A, Atlas T, Henschke CI, Yankelevitz DF, Mechanick JI, Branch AD, Fried SK, Nasir K, Fayad ZA, McConnell MV, Vliegenthart R, Maron DJ, Narula J, Williams KA Sr, Shah PK, Budoff MJ, Levy D, Benjamin EJ, Kloner RA, Wong ND. **Opportunistic AI-Derived Adiposity Measures from Coronary Artery Calcium Scans Predict New-Onset Type 2 Diabetes in Adults Without Obesity or Hyperglycemia: Insights from the AI-CVD Study within MESA.** J Am Soc Prev Cardiol. 2025.

11. Naghavi M, Azimi A, Atlas K, Reeves AP, Zhang C, Wasserthal J, Mirjalili SR, Mozafarybazargany M, Hashemi A, Atlas T, Henschke CI, Yankelevitz DF, Mechanick JI, Branch AD, Fried SK, Nasir K, Fayad ZA, McConnell MV, Vliegenthart R, Maron DJ, Narula J, Williams KA Sr, Shah PK, Budoff MJ, Levy D, Benjamin EJ, Kloner RA, Wong ND. **Artificial Intelligence-Derived Measurements of Myosteatosis in Coronary Artery Calcium Scans Are Strongly Associated with Incidence of Clinically Diagnosed COPD: An AI-CVD Study within the Multi-Ethnic Study of Atherosclerosis.** Radiol Cardiothorac Imaging. 2025.

12. Naghavi M, Azimi A, Atlas K, Reeves AP, Zhang C, Wasserthal J, Mirjalili SR, Mozafarybazargany M, Hashemi A, Atlas T, Henschke CI, Yankelevitz DF, Mechanick JI, Branch AD, Fried SK, Nasir K, Fayad ZA, McConnell MV, Vliegenthart R, Maron DJ, Narula J, Williams KA Sr, Shah PK, Budoff MJ, Levy D, Benjamin EJ, Kloner RA, Wong ND. **AI Measurement of Myosteatosis in Coronary Artery Calcium Scans Predicts Atrial Fibrillation and Heart Failure: An AI-CVD Study within the Multi-Ethnic Study of Atherosclerosis (MESA).** Eur Heart J Cardiovasc Imaging. 2025.

13. Naghavi M, Mirjalili SR, Atlas K, Reeves AP, Zhang C, Wasserthal J, Azimi A, Atlas T, Henschke CI, Yankelevitz DF, Zulueta JJ, Mechanick J, Branch A, Ma N, Yip R, Fang W, Roy SK, Nasir K, Molloi S, Fayad Z, McConnell MV, Kakadiaris IA, Abela G, Vliegenthart R, Maron DJ, Narula J, Williams K, Shah PK, Budoff MJ, Levy D, Mehran R, Kloner RA, Wong ND. **Comparing Incident Heart Failure Associated with Enlarged Cardiac Chambers versus Diabetes: An AI-CVD Study within the Multi-Ethnic Study of Atherosclerosis (MESA).** Circ Heart Fail. 2025.

14. Naghavi M, Mirjalili SR, Atlas K, Reeves AP, Zhang C, Wasserthal J, Azimi A, Hashemi A, Atlas T, Henschke CI, Yankelevitz DF, Zulueta JJ, Mechanick JI, Branch A, Yip R, Roy SK, Nasir K, Fayad Z, McConnell MV, Kakadiaris IA, Rana JS, Vliegenthart R, Maron DJ, Narula J, Williams K, Shah PK, Budoff MJ, Levy D, Mehran R, Kloner RA, Wong ND. **Artificial Intelligence Measured Cardiac Chamber Volume Ratios in Coronary Artery Calcium Scans Strongly Predict Cardiovascular Events: An AI-CVD Study within the Multi-Ethnic Study of Atherosclerosis (MESA).** J Am Soc Prev Cardiol. 2025.

Abstracts: American Heart Association Scientific Sessions (AHA 2025), American College of Cardiology (ACC 2026) and SCCT 2026

1. Mirjalili SR, Azimi A, Atlas K, Zhang C, Reeves A, Atlas T, Yankelevitz D, Henschke C, Vliegenthart R, McConnell M, Maron D, Kloner RA, Branch A, Williams K, Fried S, Mechanick JI, Wong ND, Mozafarybazargany M, Hashemi A, Yip R, Fan W, Roy S, Nasir K, Rana JS, Molloi S, Fayad ZA, Kakadiaris I, Abela GS, Narula J, Benjamin EJ, Levy D, Mehran R., Naghavi M. **AI-CVD-AF: A NOVEL ATRIAL FIBRILLATION PREDICTION MODEL BASED SOLELY ON CORONARY ARTERY CALCIUM SCANS** submitted to annual scientific sessions of American College of Cardiology (ACC) 2026.

2. Mirjalili SR, Azimi A, Atlas K, Zhang C, Reeves A, Atlas T, Yankelevitz D, Henschke C, Vliegenthart R, McConnell M, Maron D, Kloner RA, Branch A, Williams K, Fried S, Mechanick JI, Wong ND, Mozafarybazargany M, Hashemi A, Yip R, Fan W, Roy S, Nasir K, Rana JS, Molloi S, Fayad ZA, Kakadiaris I, Abela GS, Narula J, Benjamin EJ, Levy D, Mehran R., Naghavi M. **AI-CVD-HF: A NOVEL HEART FAILURE PREDICTION MODEL BASED SOLELY ON CORONARY ARTERY CALCIUM SCANS OUTPERFORMS PREVENT-HF** submitted to annual scientific sessions of American College of Cardiology (ACC) 2026.

3. Mozafarybazargany M, Azimi A, Atlas K, Zhang C, Reeves A, Atlas T, Yankelevitz D, Henschke C, Vliegenthart R, McConnell M, Maron D, Kloner RA, Branch A, Williams K, Fried S, Mechanick JI, Wong ND, Mozafarybazargany M, Hashemi A, Yip R, Fan W, Roy S, Nasir K, Rana JS, Molloi S, Fayad ZA, Kakadiaris I, Abela GS, Narula J, Benjamin EJ, Levy D, Mehran R., Naghavi M **Long-term Lung Cancer Risk Prediction Using Sybil AI on Routine Coronary Artery Calcium Scans: A 15-Year Study in the MESA Cohort submitted to annual scientific sessions of SCCT 2026.**

4. Mozafarybazargany M, Azimi A, Atlas K, Zhang C, Reeves A, Atlas T, Yankelevitz D, Henschke C, Vliegenthart R, McConnell M, Maron D, Kloner RA, Branch A, Williams K, Fried S, Mechanick JI, Wong ND, Hashemi A, Yip R, Fan W, Roy S, Nasir K, Rana JS, Molloi S, Fayad ZA, Kakadiaris I, Abela GS, Narula J, Benjamin EJ, Levy D, Mehran R., Naghavi M **Performance of Sybil AI for Lung Cancer Risk Assessment: A Head-to-Head Comparison of Cardiac vs. Lung CT Scans** submitted to annual scientific sessions of SCCT 2026.

5. Naghavi M, Azimi A, Atlas K, Zhang C, Reeves A, Atlas T, Yankelevitz D, Henschke C, Vliegenthart R, McConnell M, Maron D, Kloner RA, Branch A, Williams K, Fried S, Mechanick JI, Wong ND, Mozafarybazargany M, Hashemi A, Yip R, Fan W, Roy S, Nasir K, Rana JS, Molloi S, Fayad ZA, Kakadiaris I, Abela GS, Narula J, Benjamin EJ, Levy D, Mehran R. **Heart Failure and Atrial Fibrillation Prediction from Non-gated Chest CT Scans Using AI-Based Cardiac Chamber Volumetry: An AI-CVD Study within the Multi-Ethnic Study of Atherosclerosis (MESA)**

6. Naghavi M, Atlas K, Zhang C, Reeves A, Branch A, Wasserthal J, Atlas T, Yankelevitz D, Henschke C, Wong ND, Kloner RA. **Identification of High Risk Cases in Coronary Artery Calcium (CAC) Scans based on CAC Score and AI-driven Cardiometabolic Biomarkers: An AI-CVD Study within the Multi-Ethnic Study of Atherosclerosis (MESA).** submitted to annual scientific sessions of American Heart Association November 2025.

7. Naghavi M, Mirjalili SR, Atlas K, Zhang C, Reeves A, Azimi A, Wong ND. **AI-CVD vs. PREVENT for Predicting Incident Heart Failure: The Multi-Ethnic Study of Atherosclerosis (MESA).** submitted to annual scientific sessions of American Heart Association November 2025.

8. Naghavi M, Azimi A, Atlas K, Zhang C, Reeves A, Atlas T, Yankelevitz D, Henschke C, Vliegenthart R, McConnell M, Maron D, Kloner RA, Branch A, Williams K, Fried S, Mechanick JI, Wong ND, Mozafarybazargany M, Hashemi A, Yip R, Fan W, Roy S, Nasir K, Rana JS, Molloi S, Fayad ZA, Kakadiaris I, Abela GS, Narula J, Benjamin EJ, Levy D, Mehran R. **Opportunistic AI-Derived Measurements of Adiposity in Coronary Artery Calcium Scans Predict New Onset Diabetes in Normoglycemic Non-Obese Adults: An AI-CVD Study within the Multi-Ethnic Study of Atherosclerosis (MESA).** submitted to annual scientific sessions of American Heart Association November 2025.

9. Naghavi M, Mozafarybazargany M, Azimi A, Atlas K, Zhang C, Hashemi A, Mirjalili SR, Reeves A, Atlas T, Maron DJ, McConnell MV, Yankelevitz D, Branch A, Henschke C, Roy S, Nasir K, Fayad ZA, Wasserthal J, Shah PK, Williams KA, Vliegenthart R, Zulueta J, Kloner RA, Wong ND. **AI-measured Imaging Biomarkers in Coronary Artery Calcium Scans and Incident Lung Cancer: Insights from the AI-CVD Study within the Multi-Ethnic Study of Atherosclerosis (MESA).** submitted to annual scientific sessions of American Heart Association November 2025.

10. Naghavi M, Atlas K, Zhang C, Reeves A, Atlas T, Wasserthal J, Yankelevitz D, Henschke C, Wong ND. **AI-driven Aortic Valve Calcification Measurement in Coronary Artery Calcium Scan Detects Aortic Stenosis Comparably to Human Experts: An AI-CVD Study within the Framingham Heart Study.** submitted to annual scientific sessions of American Heart Association November 2025.

11. Naghavi M, Atlas K, Zhang C, Reeves A, Atlas T, Wasserthal J, McConnell M, Maron DJ, Williams KA, Vliegenthart R, Nasir K, Narula J, Benjamin EJ, Levy D, Henschke C, Yankelevitz D, Wong ND. **Artificial Intelligence-Based Coronary Artery Calcium (AI-CAC) Score Empowers the "Power of Zero": An AI-CVD Study within the Multi-Ethnic Study of Atherosclerosis (MESA).** submitted to annual scientific sessions of American Heart Association November 2025.

12. McConnell M, Mirjalili SR, Atlas K, Zhang C, Azimi A, Reeves A, Wong ND, Maron D, Naghavi M. **Predicting Non-Zero Coronary Artery Calcium Score in Middle-Aged Population: Comparing an Artificial Intelligence-based Model with Existing ASCVD Risk Scores in the Multi-Ethnic Study of Atherosclerosis (MESA).** submitted to annual scientific sessions of American Heart Association November 2025.

13. Naghavi M, Azimi A, Atlas K, Zhang C, Reeves A, Wasserthal J, Wong ND, Henschke C, Yankelevitz D, Maron DJ, Vliegenthart R, McConnell MV, Zulueta J, Williams KA, Branch A, Mechanick JI, Ma N, Yip R, Fan W, Roy S, Budoff MJ, Molloi S, Kakadiaris I, Shah PK, Abela GS, Narula J, Benjamin EJ, Levy D, Mehran R, Kloner RA. **Artificial Intelligence-Derived Myosteatosis on Coronary Artery Calcium CT Scans Predicts Incident COPD: An AI-CVD Study within the Multi-Ethnic Study of Atherosclerosis (MESA).** submitted to annual scientific sessions of American Heart Association November 2025.

14. Naghavi M, Azimi A, Atlas K, Zhang C, Reeves A, Atlas T, Yankelevitz D, Mirjalili SR, Henschke C, Wong ND, Vliegenthart R, McConnell MV, Maron DJ, Branch A, Kloner RA, Mechanick JI, Ma N, Yip R, Fan W, Roy S, Nasir K, Molloi S, Fayad ZA, Kakadiaris IA, Abela GS, Narula J, Williams KA, Shah PK, Benjamin EJ, Levy D. **AI-driven Measurement of Myosteatosis in Coronary Artery Calcium Scans Predicts Atrial Fibrillation and Heart Failure: An AI-CVD Study within the Multi-Ethnic Study of Atherosclerosis (MESA).** submitted to annual scientific sessions of American Heart Association November 2025.

AI-CVD® Summary Report

This is an opportunistic report generated by AI-CVD® based on CT scans ordered for other reasons.

Patient Name: Doe, Jack

ID: 9008
Date of Exam: 7/16/2025
Date of Birth: 1/1/1973
Gender: Male
Study Type: ECG-Gated Cardiac CT

Your Clinic's Logo Here

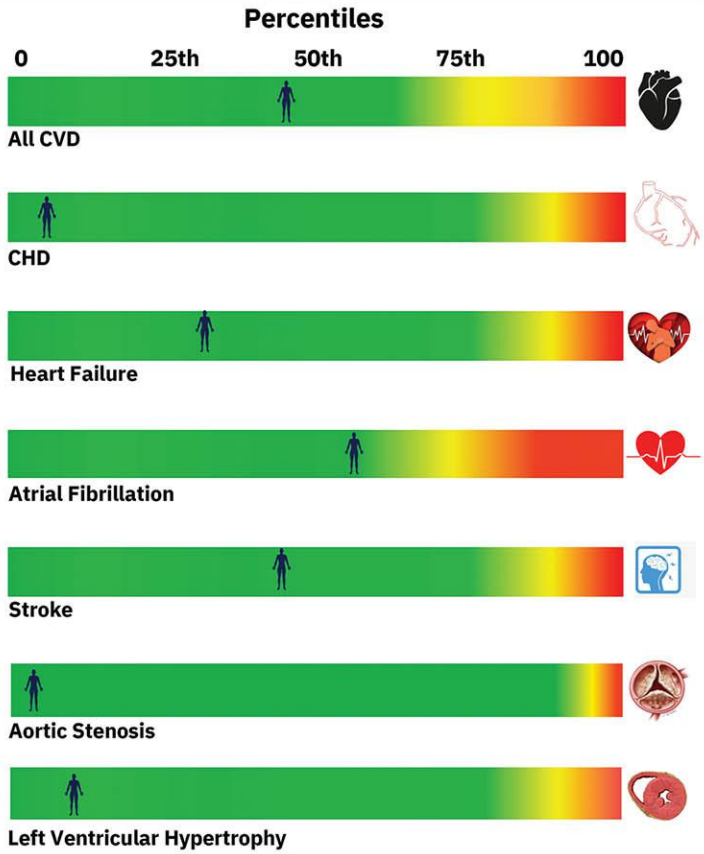
AI-CVD® Powered by HeartLung Technologies

To learn more visit www.HeartLung.ai

AI-CVD® Measurements

Agatston CAC Score	150
AI-CAC Score	165
TAC Score	355.1
AVC Score	32
MVC Score	25
LA Volume (cc)	66
LV Volume (cc)	105
RA Volume (cc)	76
RV Volume (cc)	115
LVW Mass	110
LV/RV Ratio	0.71
LA/RA Ratio	0.72
AAO Diameter (cm)	3.0
PA Diameter (cm)	2.9
AAO Volume (cc)	105
PA Volume (cc)	48
Lung LAI%	2%
Lung HAI%	1%
Liver LAI%	22%
EAT Volume (cc)	90
VAT Volume (cc)	123
Muscle Mass (g)	1200
Muscle Density (HU)	42

Your AI-CVD® Population-Based Percentiles



Your percentile is calculated based on published research literature from NIH-sponsored Multi-Ethnic Study of Atherosclerosis and Framingham Heart Study. Colors and cut-offs are based on institutional settings and are not an indication for treatment. The actual risk must be evaluated based on your care provider's comprehensive assessment.

Recommendations

Your AI-CVD® measurements are normal. See following pages for more information.

Electronically signed by: Thomas Atlas, MD 1

HeartLung Technologies

HeartLung Technologies Co.
2450 Holcombe Blvd., TMC Innovations
Houston, TX 77021
(310) 510-6004
www.HeartLung.ai
contact@heartlung.ai

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