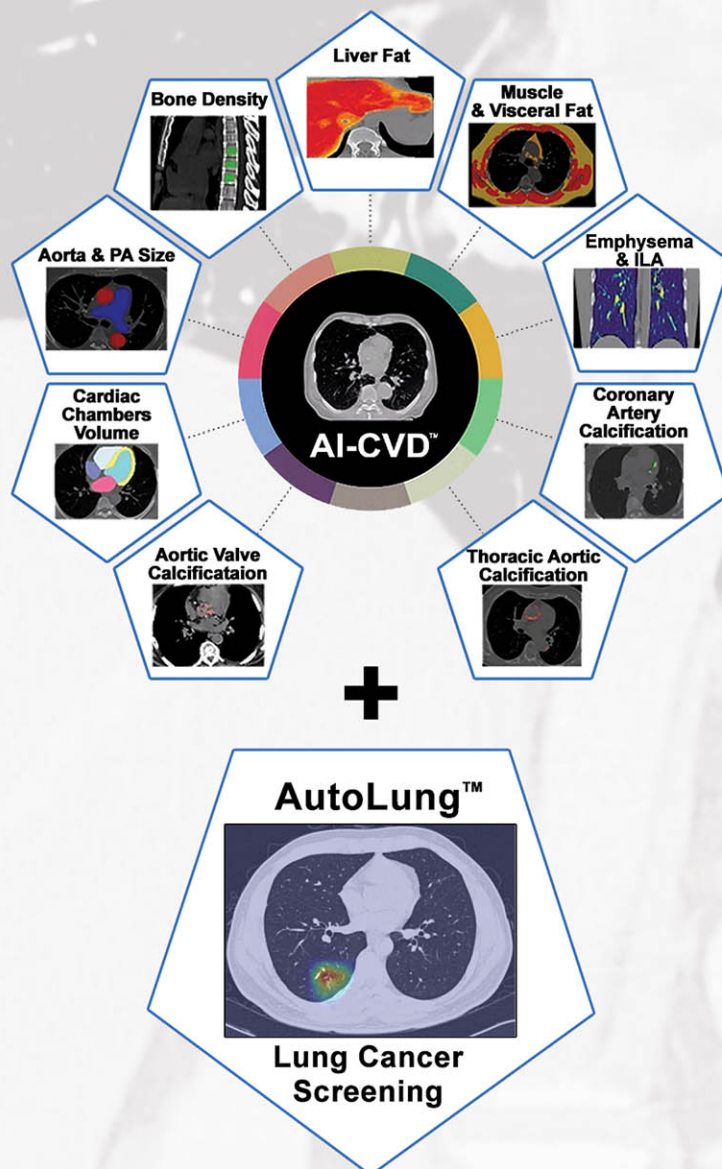




FDA-Cleared

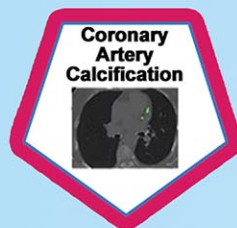
AI-CVD[®]

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

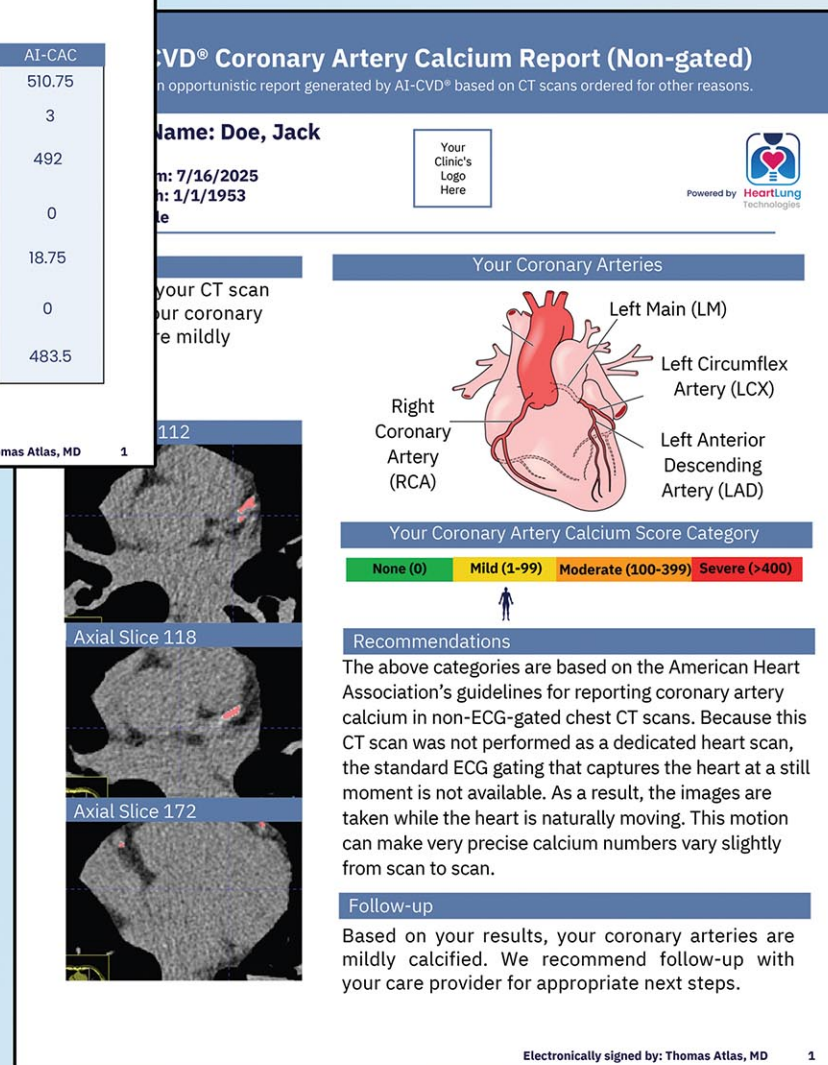
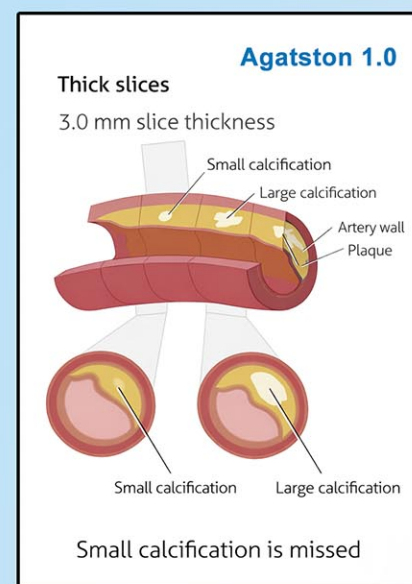
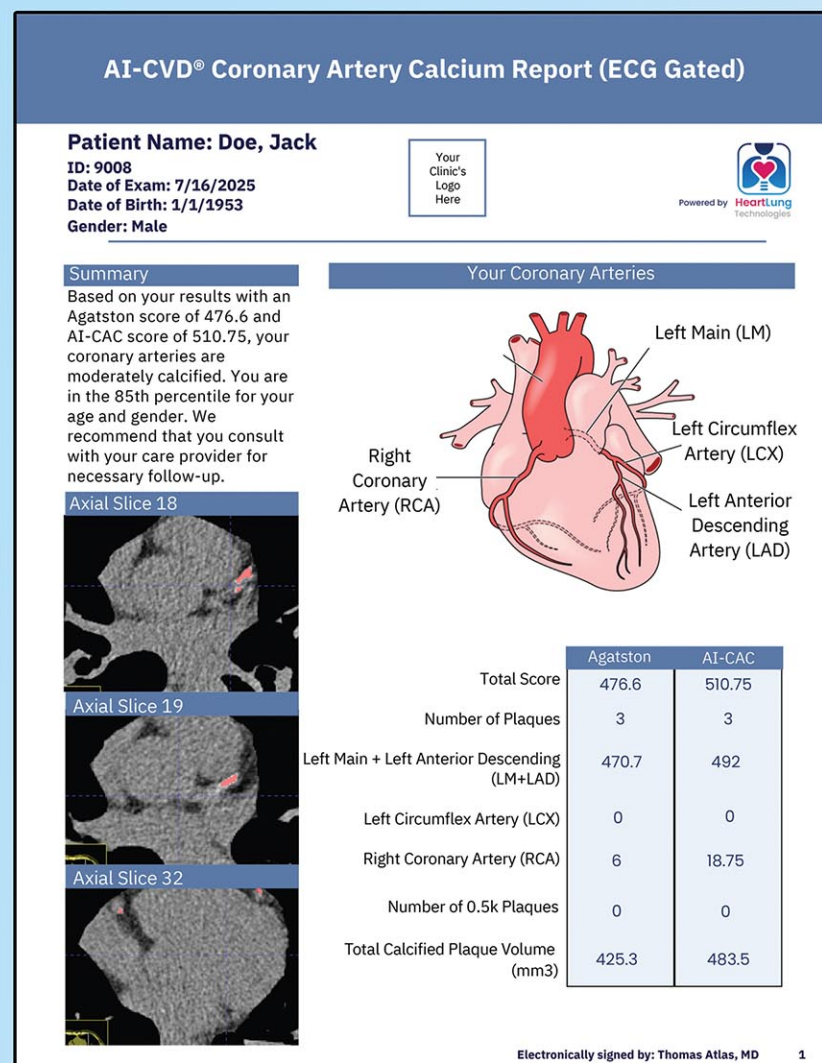


AutoLung[™] is pending FDA clearance

AI-CVD[®] Improves Patient Care and Bottom Line



Coronary Artery Calcification



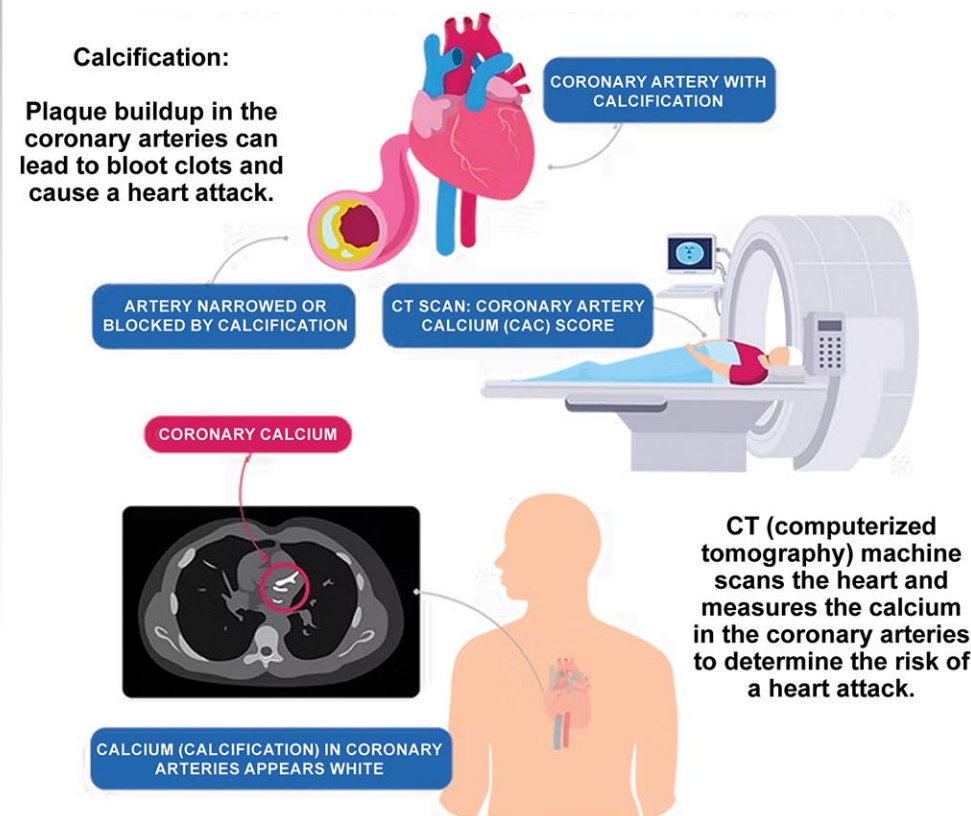
Introducing AutoCAC™ and AI-CAC®

A Calcium Score - also called a Coronary Artery Calcium (CAC) Score or Agatston 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

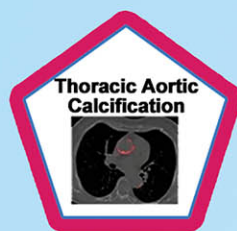


AutoCAC™ (Automated Agatston 1.0)

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
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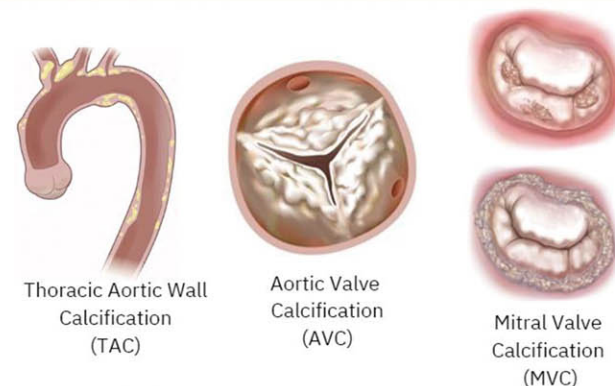


Valve Calcium Scores

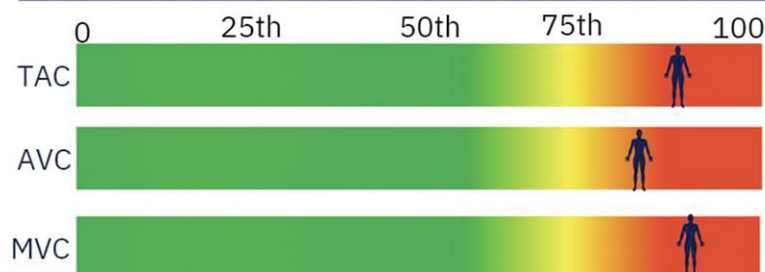
MVC Score	55
AVC Score	32

Thoracic Aortic Calcium Score

TAC Score	355.1
-----------	-------



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

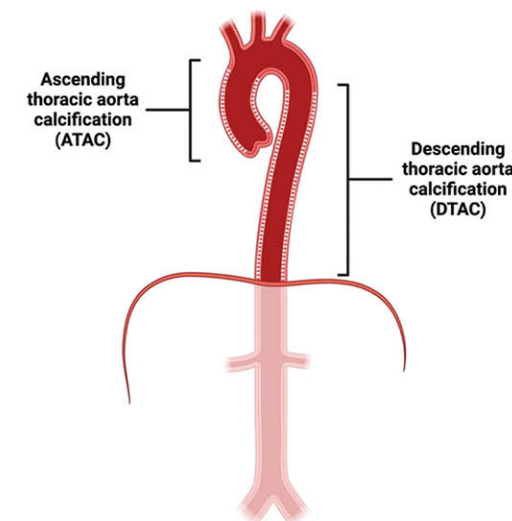
1

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.

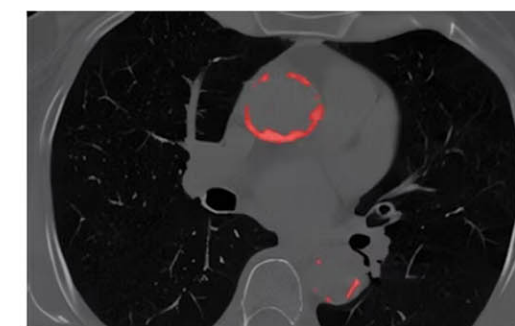
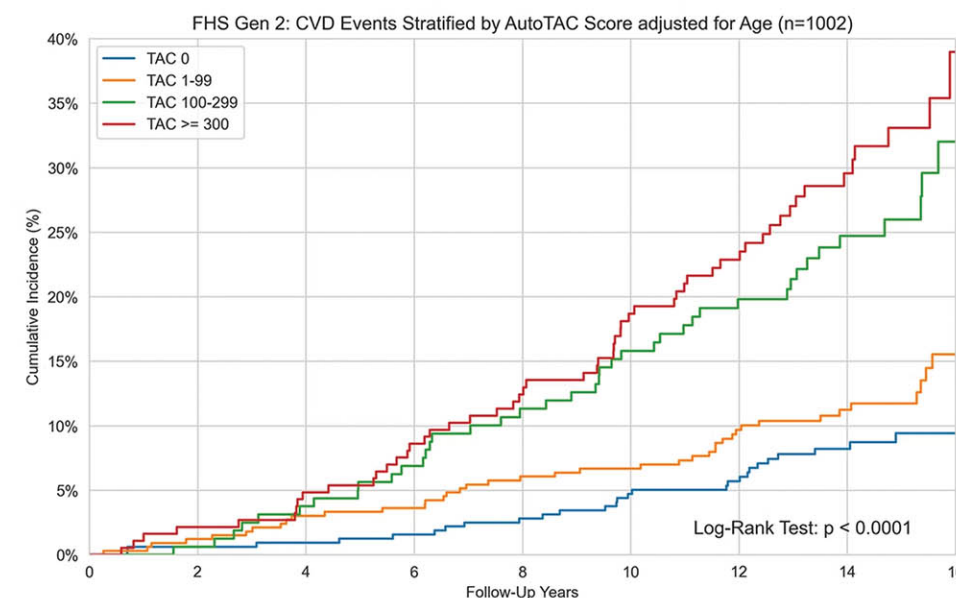
TAC, an often-overlooked finding in CAC scans, predicts stroke and CVD mortality with greater precision when combined with traditional risk factors. As a marker of systemic atherosclerosis, TAC enhances risk stratification for cerebrovascular events,

THORACIC AORTA CALCIFICATION

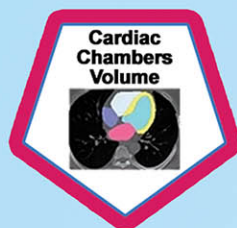


Enhanced Risk Stratification

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

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Clinic's
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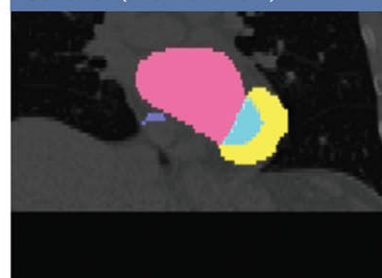


AutoChamber Volumetry

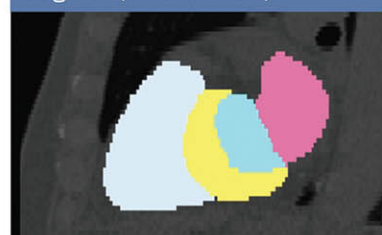
Chamber	Value	Percentile
LA	89.1 cc	96th
LV	121.6 cc	80th
RA	88.7 cc	58th
RV	131.8 cc	65th
LVM	118.5 g	90th
LA/RA	0.90	80th
LV/RV	0.75	74th

Cardio-Thoracic Ratio (CTR): 0.51

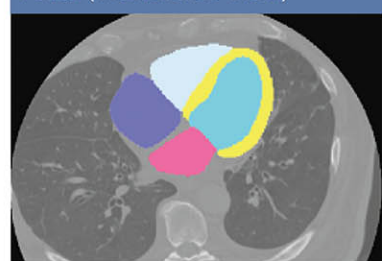
Coronal (Frontal View)



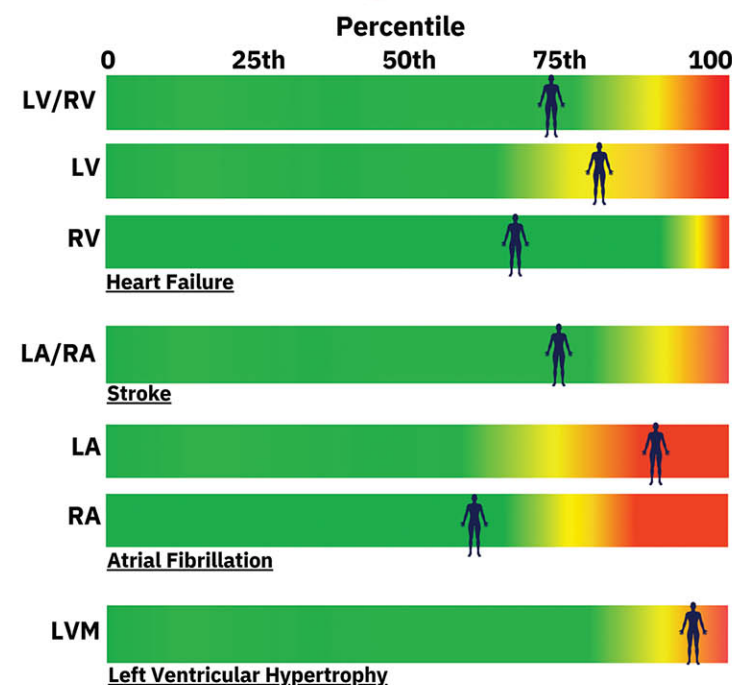
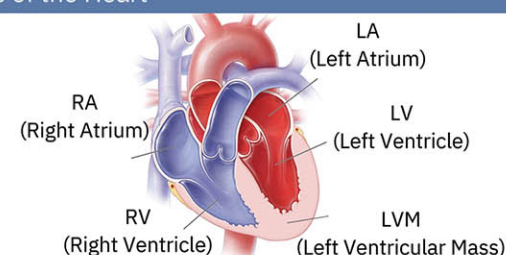
Sagittal (Lateral View)



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

Electronically signed by: Thomas Atlas, MD

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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.

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.

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.

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



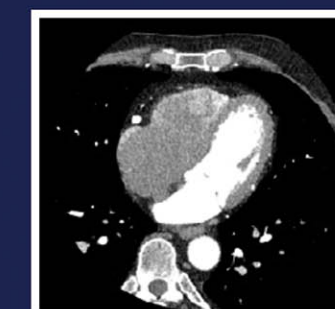
LDCT Lung Cancer Screening Scan



Lung Diagnostic Scan

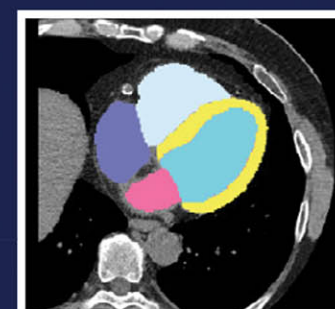


Coronary CT Angiography Scan

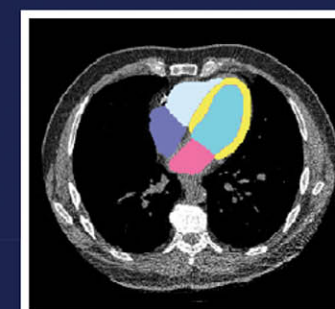


After AutoChamber™

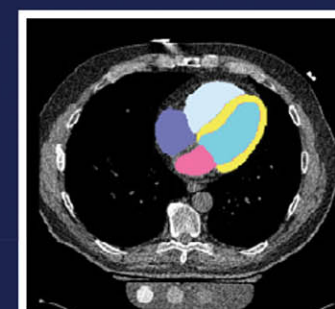
Coronary Artery Calcium Scan



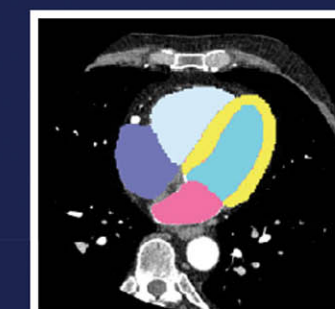
LDCT Lung Cancer Screening Scan



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

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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

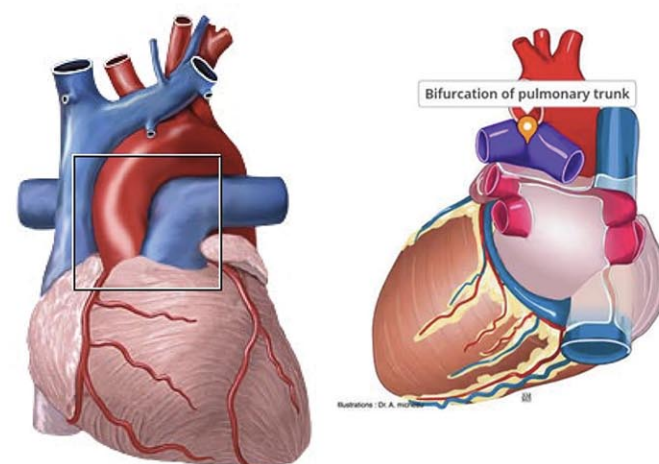
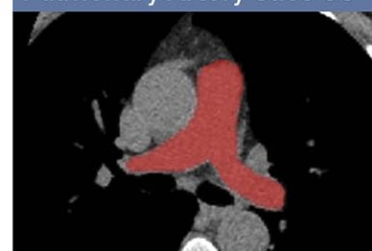
Ascending Aorta Slice 56



Descending Aorta Slice 56



Pulmonary Artery Slice 56



More Information

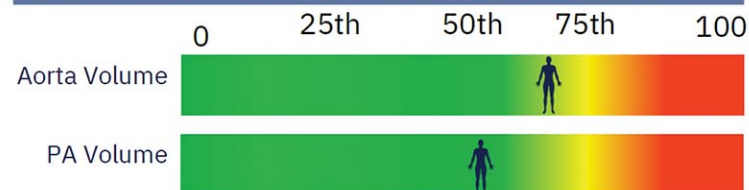
Aorta Diameter

- o ≥ 40 mm is considered dilated and warrants further evaluation

Main Pulmonary Artery Diameter

- o 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

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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.

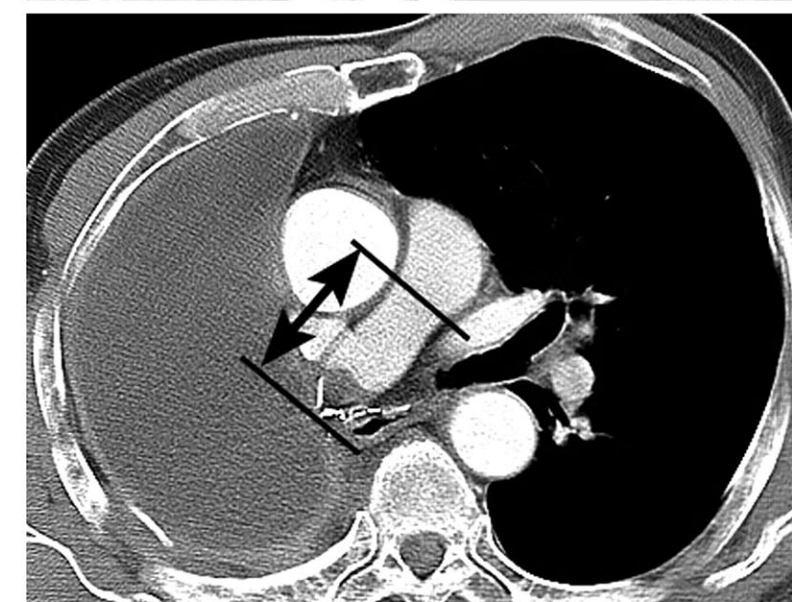
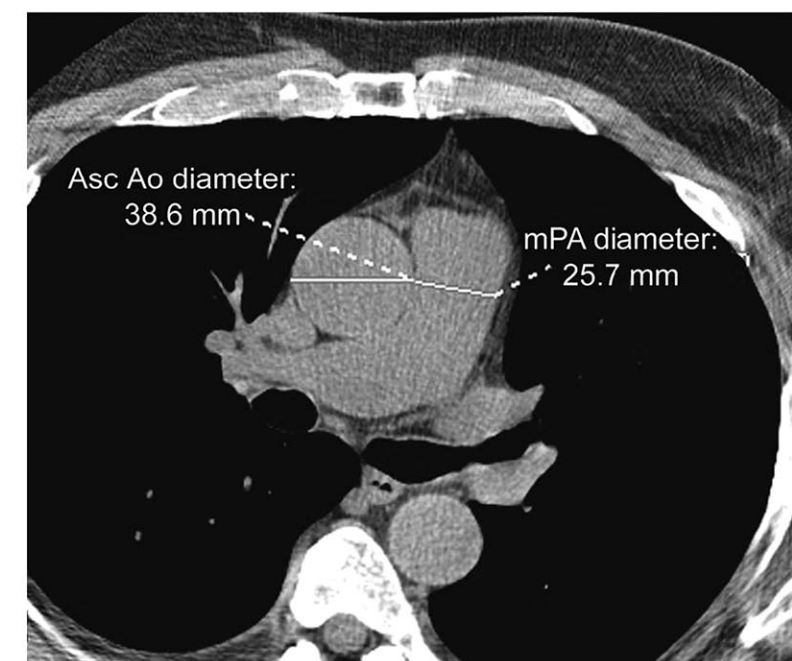
Enlargement of the ascending or descending aorta is associated with conditions such as hypertension, connective-tissue disorders, and aortic aneurysm.

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
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Your Measurements

Weight (lbs) 175
BSA (kg/m2) 1.9

Epicardial Fat Volume (cc) 110
Epicardial Fat Index 68.5

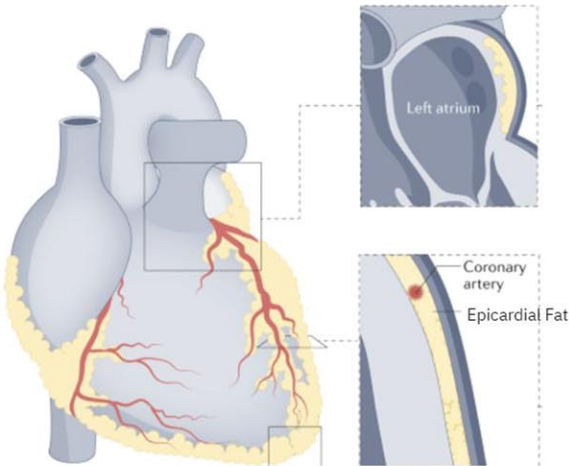
Sagittal (Lateral view)



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

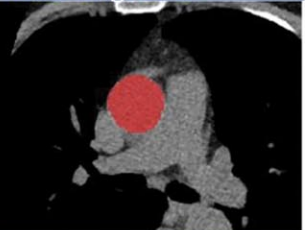
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Aortic Diameters

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

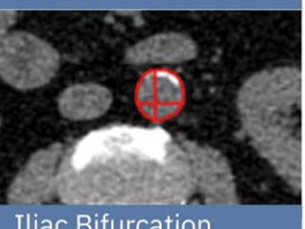
Ascending Aorta



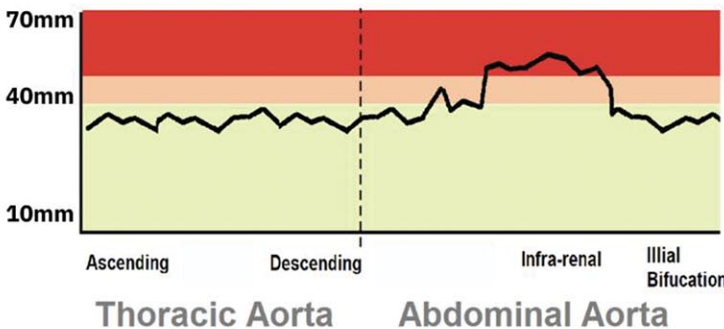
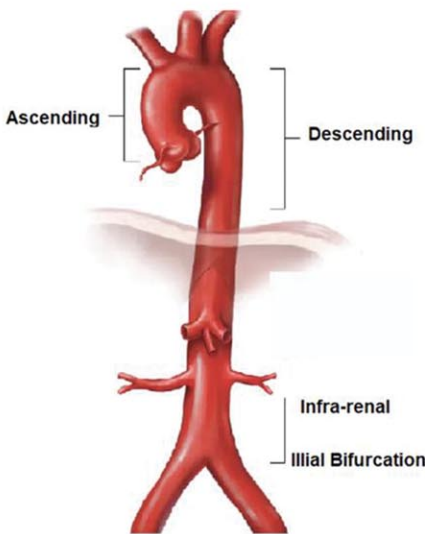
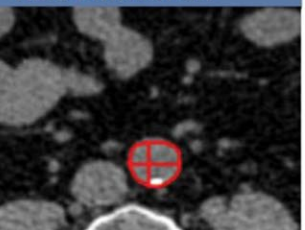
Descending Aorta



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
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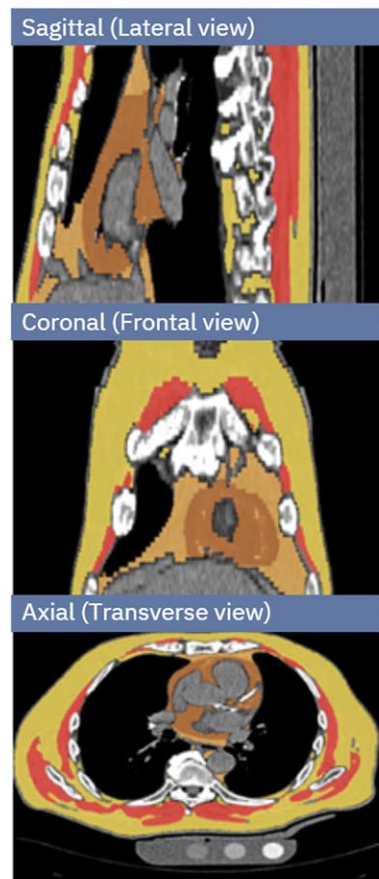
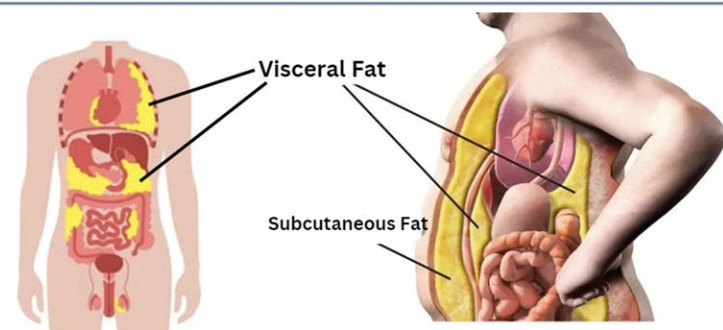
Current Measurements

Weight (lbs) **175**
BMI (kg/m2) **26.5**

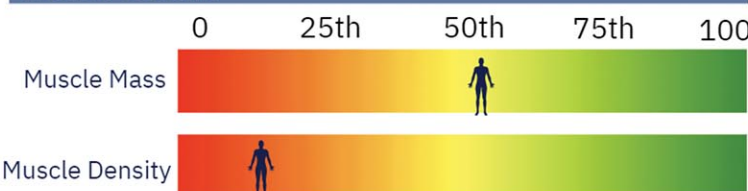
Muscle Mass (g) **1400**
Muscle Density (HU) **28**

Visceral Fat Mass (g) **260**
Subcutaneous Fat Mass (g) **1543**

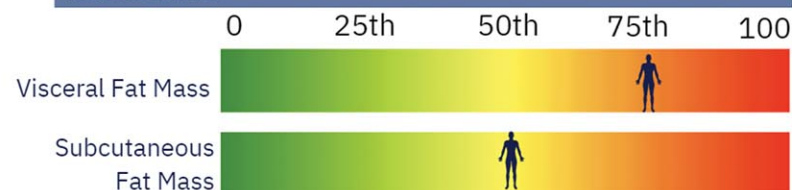
Visceral-to-Subcutaneous
Fat Ratio **1.3**



Muscle Percentile



Fat Percentile



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

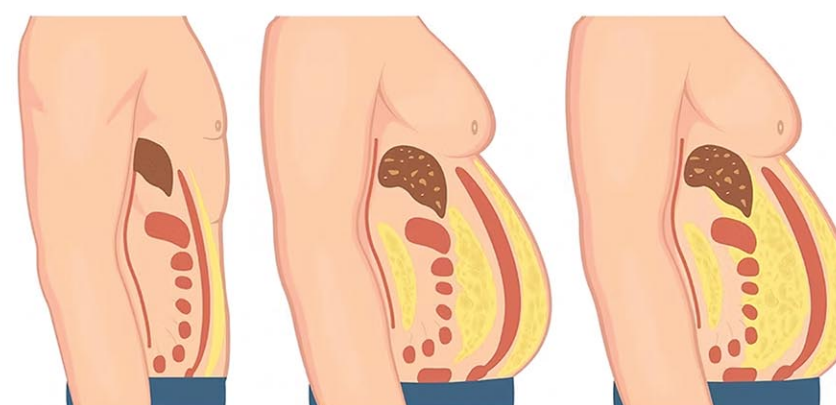
Visceral fat—a major driver of systemic inflammation and insulin resistance—is measurable in CAC scans. Increased visceral fat volume is a powerful predictor of metabolic syndrome, type 2 diabetes, and CVD. AI-CVD's ability to quantify visceral fat improves risk stratification for these conditions. Myosteator, 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 myosteator with CAC scores amplifies risk prediction, particularly for males, making it a critical addition to AI-CVD.



Enhanced Risk Stratification with AI-CVD®

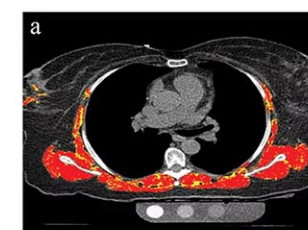
HeartLung's AI-CVD® leverages advanced AI algorithms to quantify visceral fat and measure thoracic skeletal muscle density from CAC scans. This data, combined with CAC scores and traditional risk factors such as BMI, cholesterol levels, and blood pressure, enhances the predictive accuracy for metabolic 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, myosteator, and systemic metabolic dysfunction.

Visceral Body Fat



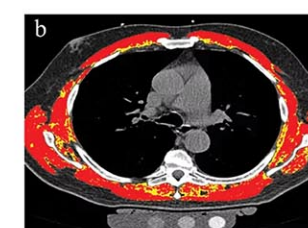
Case Example 1:

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



● Thoracic Skeletal Muscle
● Intermuscular Fat



Liver Fat

AI-CVD® Liver Report

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

Patient Name: Doe, Jane

ID: 9008

Date of Exam: 7/16/2025

Date of Birth: 1/1/1953

Gender: Female

Study Type: ECG-Gated Cardiac CT

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Clinic's
Logo
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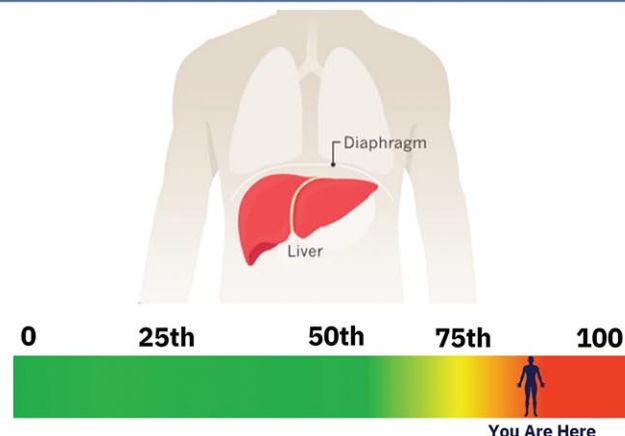


To learn more visit
www.HeartLung.ai

Your Measurements

LAI **85%**
LAI Percentile **78th**
Liver Mean HU **32**
Liver Volume in FOV* **250 cc**

Liver Attenuation Index (LAI) Percentile



The above percentiles are calculated based on your 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.

The liver attenuation index (LAI) is a measure of liver density that evaluates the effects of liver fat infiltration using CT attenuation values. It measures the proportion of voxels below 40 HU in the entire segmented liver.

Recommendations

Maintaining metabolic health through balanced nutrition primarily consisting of whole, minimally processed foods, regular physical activity, and weight management is important to support liver health.

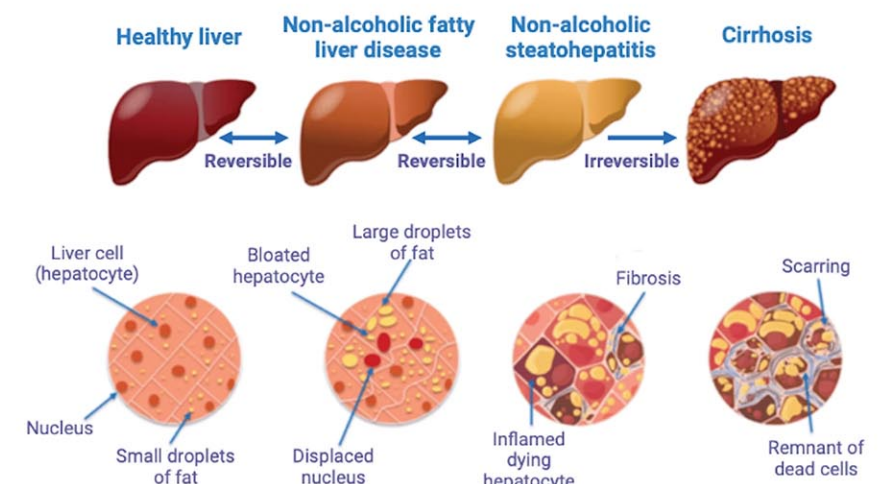
Follow-up

Based on your results, your LAI is elevated and may be associated with cardiometabolic disorders including fatty liver disease, metabolic dysfunction, and cardiovascular disease. Follow-up with a healthcare provider is advised for further evaluation and management.

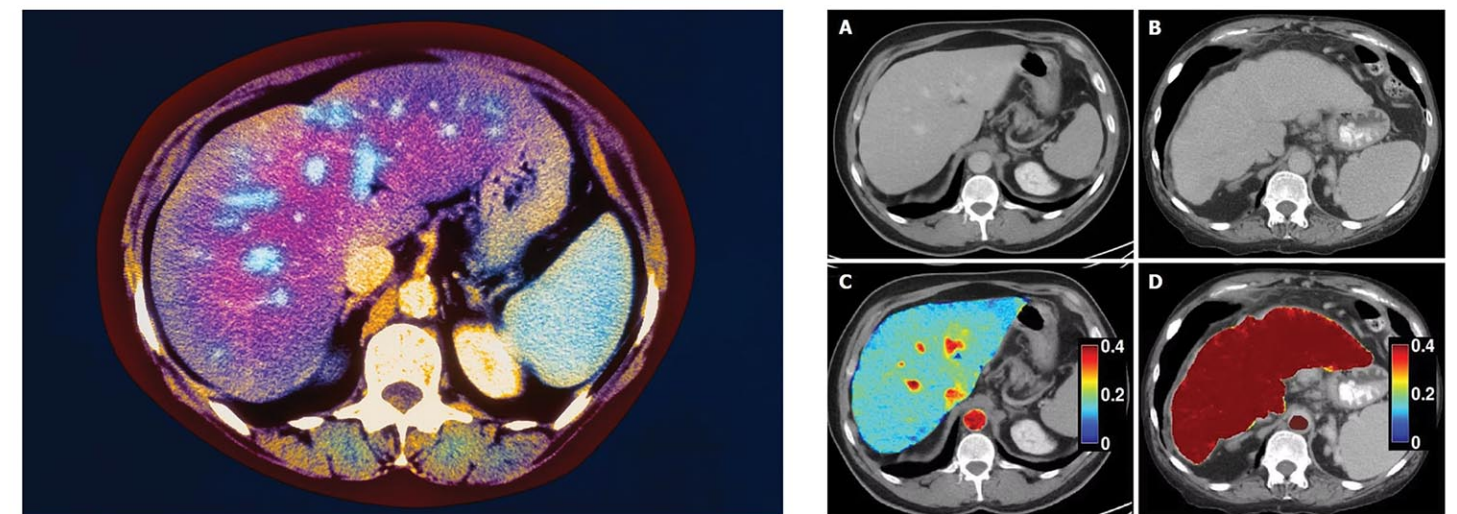
Electronically signed by: Thomas Atlas, MD

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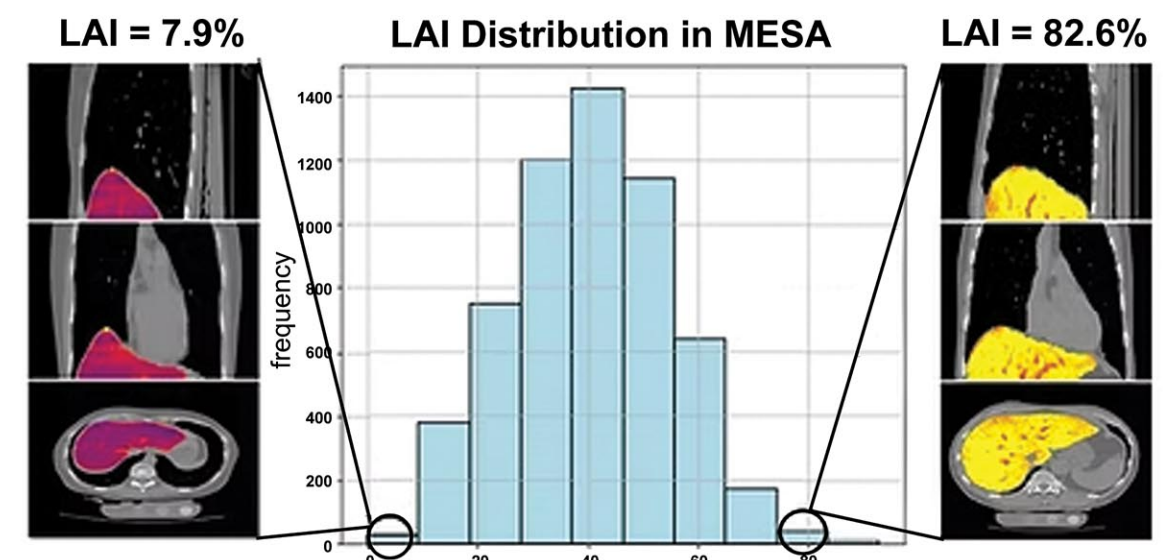
Fatty liver, also known as hepatic steatosis, is a condition characterized by the accumulation of fat in the liver cells. Detected opportunistically in coronary artery calcium (CAC) scans, fatty liver is a significant marker for metabolic syndrome, diabetes, and an increased risk of cardiovascular disease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

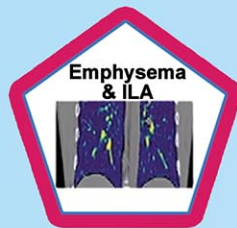


AI-CVD® leverages advanced imaging algorithms to quantify liver fat, providing a comprehensive assessment of an individual's cardiometabolic health.



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

AI-CVD® Lung Density Report: Low Attenuation Index

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

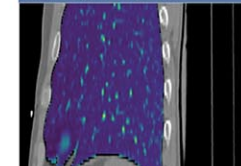
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Clinic's
Logo
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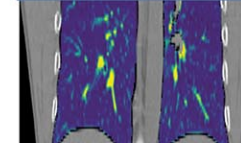
Lung Low Attenuation Index (LAI)*	
RUL	2.5%
RML	1.8%
RLL	1.5%
LUL	3.8%
LLL	2.5%
R-Lung	1.93%
L-Lung	3.15%
Total Lung	2.55%

*Percentage of voxels below -950 HU

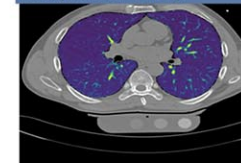
Sagittal (Lateral view)



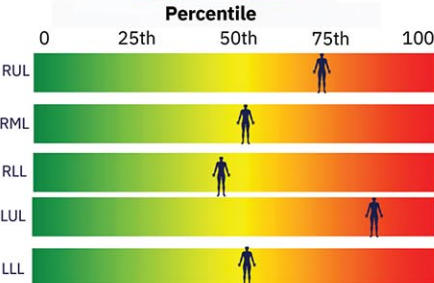
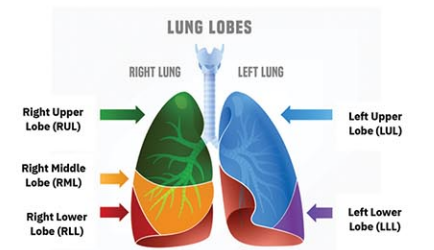
Coronal (Frontal view)



Axial (Transverse view)



Percentiles by Lung Lobe



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 Lung LAI is elevated. Additional testing may be necessary based on clinical judgment.

Electronically signed by: Thomas Atlas, MD

Lung Density Report: High Attenuation Index

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
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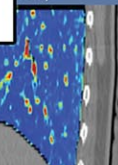


Lung Low Attenuation Index (LAI)*

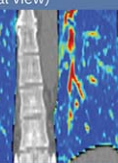
RUL	2.5%
RML	1.8%
RLL	1.5%
LUL	3.8%
LLL	2.5%
R-Lung	1.93%
L-Lung	3.15%
Total Lung	2.55%

*Percentage of voxels below -950 HU

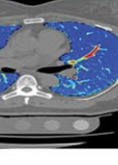
Sagittal (Lateral view)



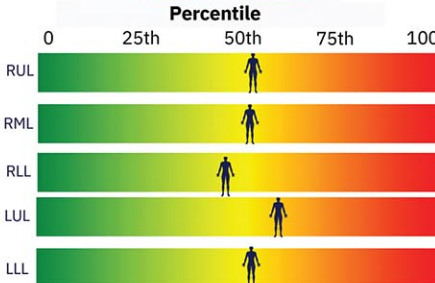
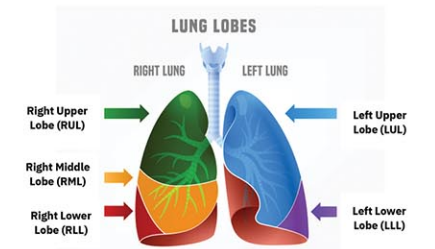
Coronal (Frontal view)



Axial (Transverse view)



Percentiles by Lung Lobe



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

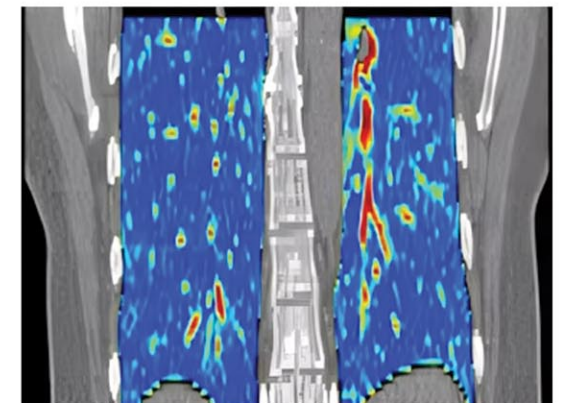
Based on your results, your Lung LAI is elevated. Additional testing may be necessary based on clinical judgment.

Electronically signed by: Thomas Atlas, MD

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.

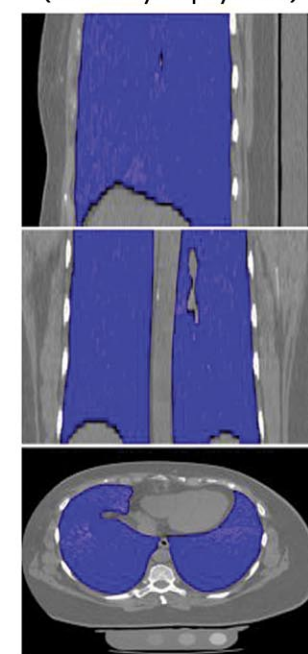


Emphysema Scoring in AI-CVD®

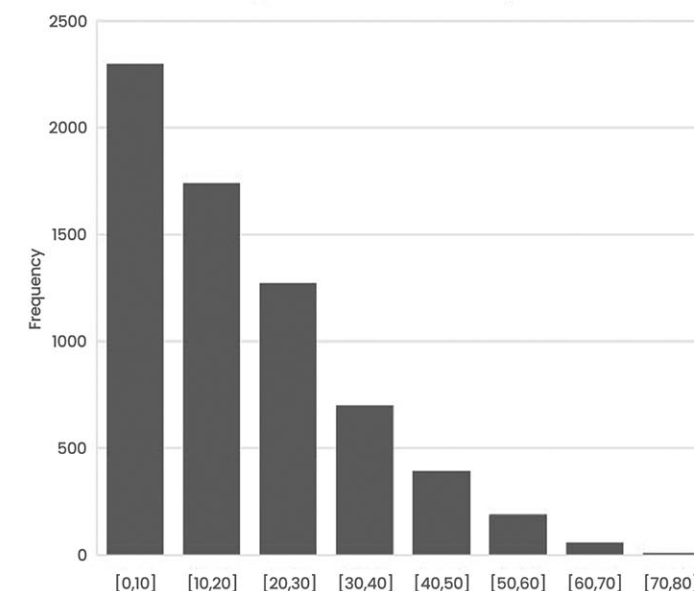
Emphysema is a chronic lung condition characterized by damage to the alveoli, leading to breathing difficulties and reduced oxygen exchange.

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.

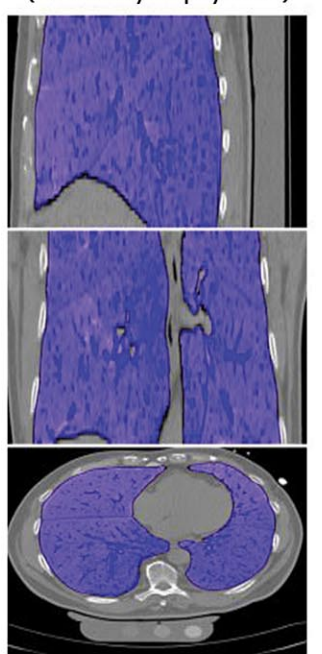
Low Lung LAI
(Less Likely Emphysema)

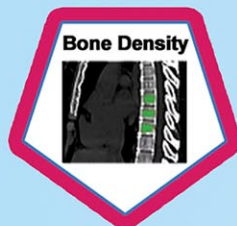


AI-CVD Lung Low Attenuation Index (% of Voxels < -950HU
Traditionally Uses as an Emphysema-like Biomarker) in the
Right Upper Lobe of MESA Participants



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



Hounsfield Unit (HU)

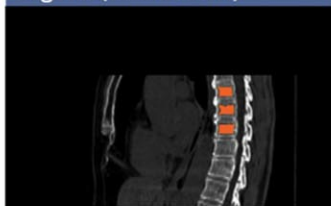
A quantitative scale for describing radiodensity.

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

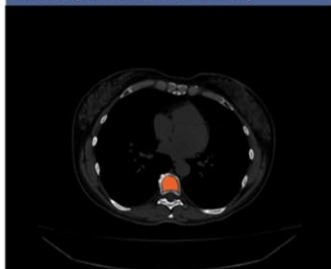
Sagittal (Lateral View)



Coronal (Frontal View)

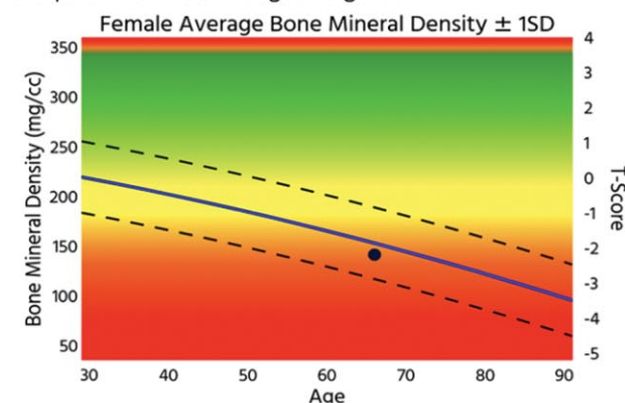


Axial (Transverse View)



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).

Osteoporosis	Osteopenia	Normal Bone Density
-4	-3 -2.5 -2	-1 0 +1 +2



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

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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)



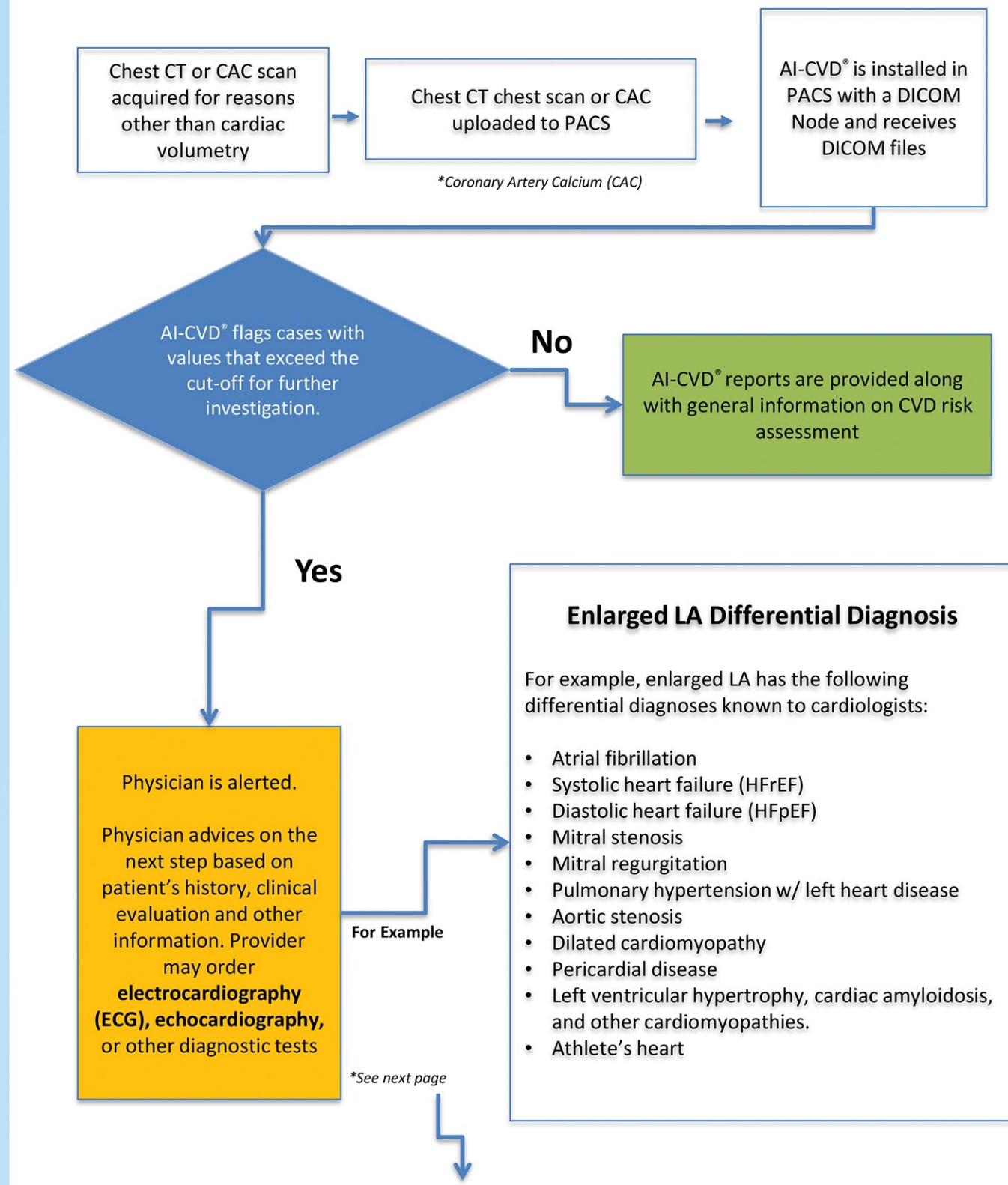
DEXA Scan



CT Scan

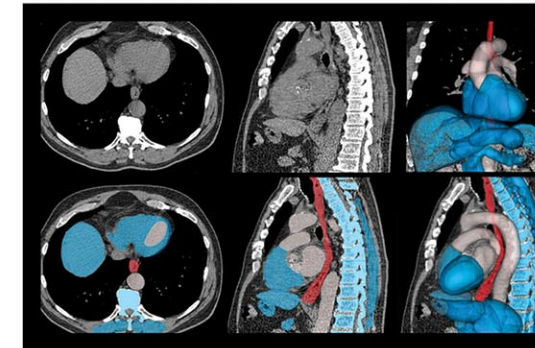
AutoBMD uses QCT but does not require a new scan. It is superior to DEXA and regular scans and works on all CT scans (both existing and new scans). AutoBMD can be run on Coronary Artery Calcium Scans, Lung Cancer Screening Scans, and Thoracic & Abdominal Scans.

AI-CVD® Workflow

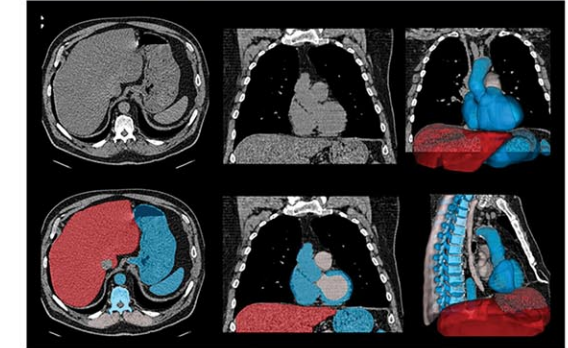


AI-CVD® FDA-Cleared Indications for Use

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

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An example of a customized AI-CVD cardiac chambers analysis 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.

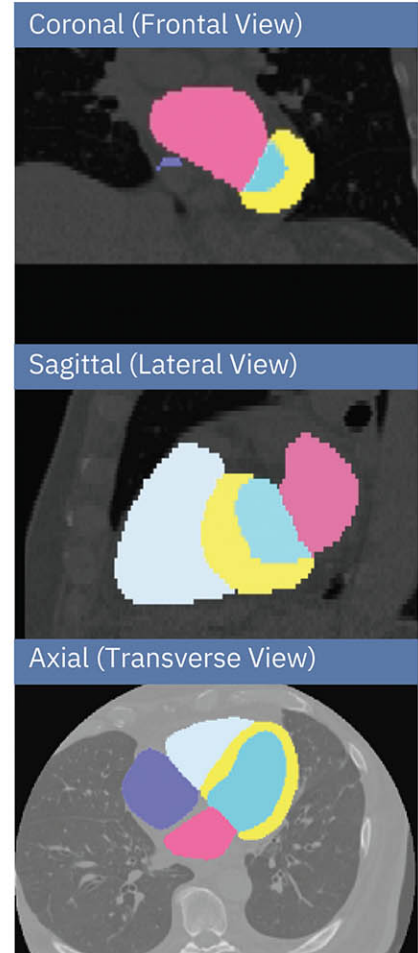
Patient Name: Doe, Jack
ID: 9008
Date of Exam: 7/16/2025
Date of Birth: 1/1/1953
Gender: Male

Your
Clinic's
Logo
Here



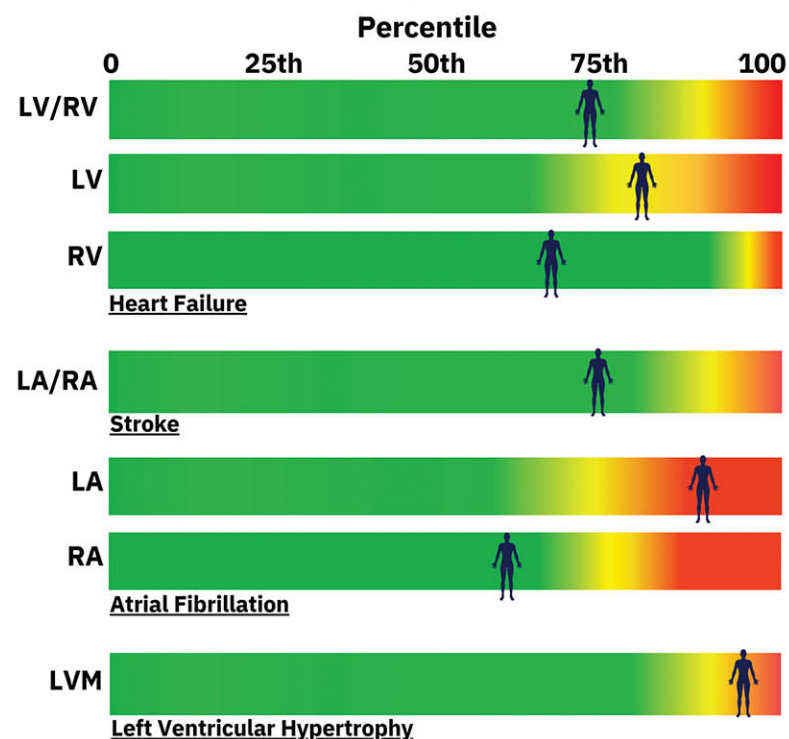
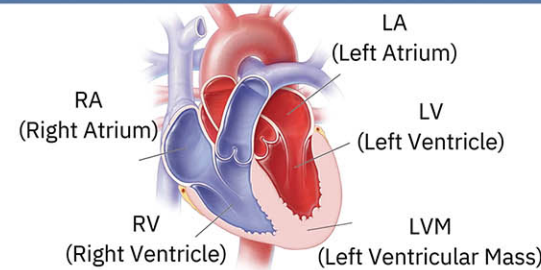
AutoChamber Volumetry		
Chamber	Value	Percentile
LA	89.1 cc	96th
LV	121.6 cc	80th
RA	88.7 cc	58th
RV	131.8 cc	65th
LVM	118.5 g	90th
LA/RA	0.90	80th
LV/RV	0.75	74th

Cardio-Thoracic Ratio (CTR): 0.51



SERIES 202

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

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About Cardiac Chambers & Cardiovascular Disease



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	< 91 st percentile
5 to 20 in 100 people	Yellow	91 st to 98 th percentile
> 20 in 100 people	Red	> 98 th percentile
Left Ventricular (LV) Volume Percentile Cutoffs		
Incidence of Heart Failure Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 84 th percentile
5 to 20 in 100 people	Yellow	84 th to 95 th percentile
> 20 in 100 people	Red	> 95 th percentile
Right Ventricular (RV) Volume Percentile Cutoffs		
Incidence of Heart Failure Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 95 th percentile
5 to 20 in 100 people	Yellow	95 th to 99 th percentile
> 20 in 100 people	Red	> 99 th percentile
LA/RA Ratio Percentile Cutoffs		
Incidence of Stroke Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 94 th percentile
5 to 20 in 100 people	Yellow	94 th to 96 th percentile
> 20 in 100 people	Red	> 96 th percentile
Left Atrial (LA) Volume Percentile Cutoffs		
Incidence of Atrial Fibrillation Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 65 th percentile
5 to 20 in 100 people	Yellow	65 th to 79 th percentile
> 20 in 100 people	Red	> 79 th percentile
Right Atrial (RA) Volume Percentile Cutoffs		
Incidence of Atrial Fibrillation Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 66 th percentile
5 to 20 in 100 people	Yellow	66 th to 82 nd percentile
> 20 in 100 people	Red	> 82 nd percentile
Left Ventricular Mass (LVM) Percentile Cutoffs		
Left Ventricular Hypertrophy Suspected	Color	Percentile Range
Equivalent to CMRI LVMi < 100g/m ² BSA	Green	< 90 th percentile
Equivalent to CMRI LVMi 100 to 115g/m ² BSA	Yellow	90 th to 98 th percentile
Equivalent to CMRI LVMi > 115g/m ² BSA	Red	> 98 th 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	< 92 nd percentile
5 to 20 in 100 people	Yellow	92 nd to 99 th percentile
> 20 in 100 people	Red	> 99 th percentile
Left Ventricular (LV) Volume Percentile Cutoffs		
Incidence of Heart Failure Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 93 rd percentile
5 to 20 in 100 people	Yellow	93 rd to 99 th percentile
> 20 in 100 people	Red	> 99 th percentile
Right Ventricular (RV) Volume Percentile Cutoffs		
Incidence of Heart Failure Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 95 th percentile
5 to 20 in 100 people	Yellow	95 th to 99 th percentile
> 20 in 100 people	Red	> 99 th percentile
LA/RA Ratio Percentile Cutoffs		
Incidence of Stroke Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 95 th percentile
5 to 20 in 100 people	Yellow	95 th to 99 th percentile
> 20 in 100 people	Red	> 99 th percentile
Left Atrial (LA) Volume Percentile Cutoffs		
Incidence of Atrial Fibrillation Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 79 th percentile
5 to 20 in 100 people	Yellow	79 th to 90 th percentile
> 20 in 100 people	Red	> 90 th percentile
Right Atrial (RA) Volume Percentile Cutoffs		
Incidence of Atrial Fibrillation Over 10 Years	Color	Percentile Range
< 5 in 100 people	Green	< 79 th percentile
5 to 20 in 100 people	Yellow	79 th to 96 th percentile
> 20 in 100 people	Red	> 96 th percentile
Left Ventricular Mass (LVM) Percentile Cutoffs		
Left Ventricular Hypertrophy Suspected	Color	Percentile Range
Equivalent to CMRI LVMi < 80g/m ² BSA	Green	< 91 st percentile
Equivalent to CMRI LVMi 80 to 95g/m ² BSA	Yellow	91 st to 98 th percentile
Equivalent to CMRI LVMi > 95g/m ² BSA	Red	> 98 th 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.

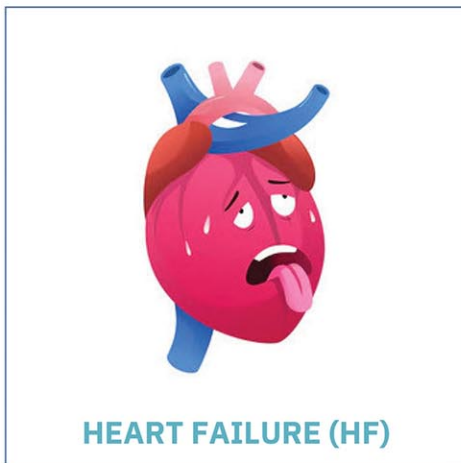
2

About Cardiac Chambers & Cardiovascular Disease

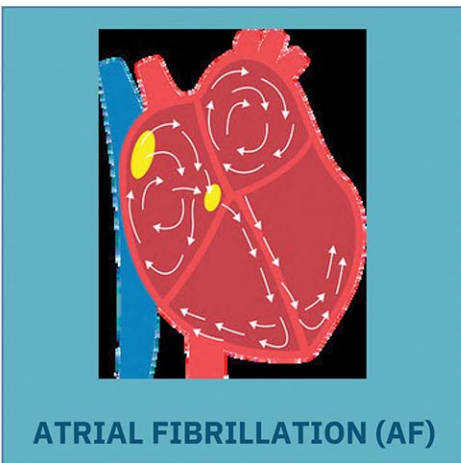


Introduction

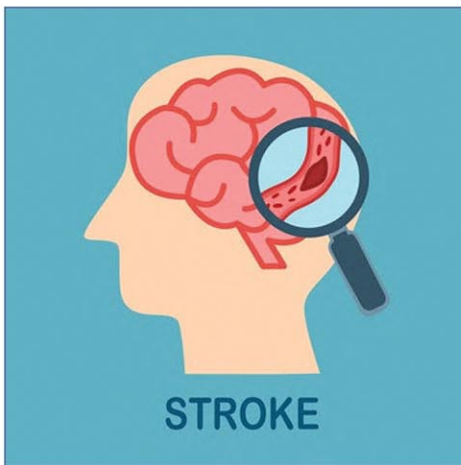
Cardiovascular disease (CVD) remains the leading cause of morbidity and mortality worldwide, and four key conditions—heart failure (HF), left ventricular hypertrophy (LVH), stroke, and atrial fibrillation (AF)—represent critical targets for prevention and early detection. Heart failure, a terminal stage 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.



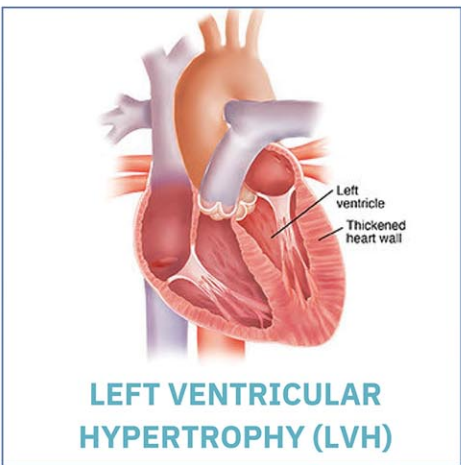
HEART FAILURE (HF)



ATRIAL FIBRILLATION (AF)



STROKE



LEFT VENTRICULAR HYPERTROPHY (LVH)

About Cardiac Chambers & Cardiovascular Disease



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?

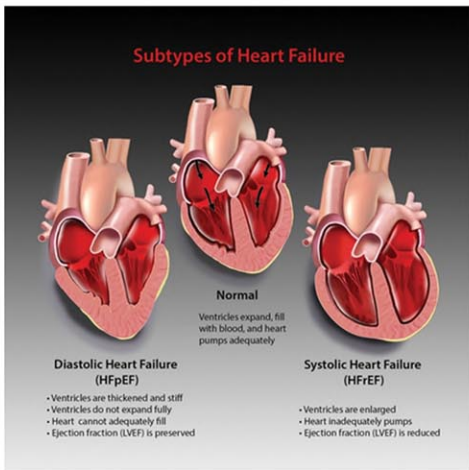
Undiagnosed heart failure is surprisingly common, especially in early stages. Up to half of patients with mild symptoms may not realize they have heart failure, attributing tiredness or breathing difficulty to aging or fitness issues.

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



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



About Atrial Fibrillation (AF)

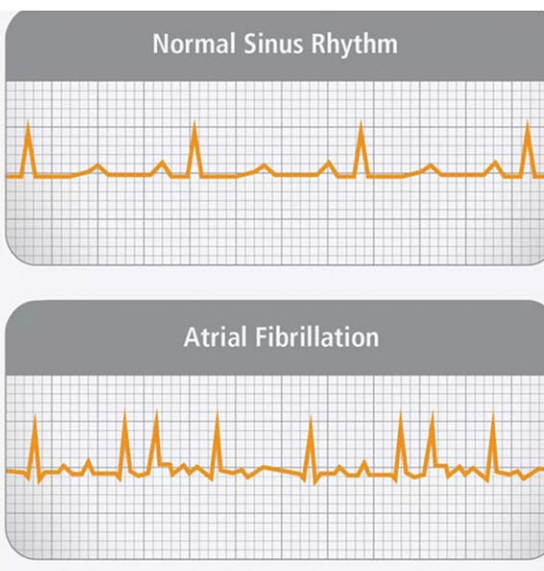
Atrial fibrillation is a common heart rhythm disorder affecting millions of people worldwide. AF occurs when the upper chambers of the heart, called the atria, beat irregularly and rapidly.

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.

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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

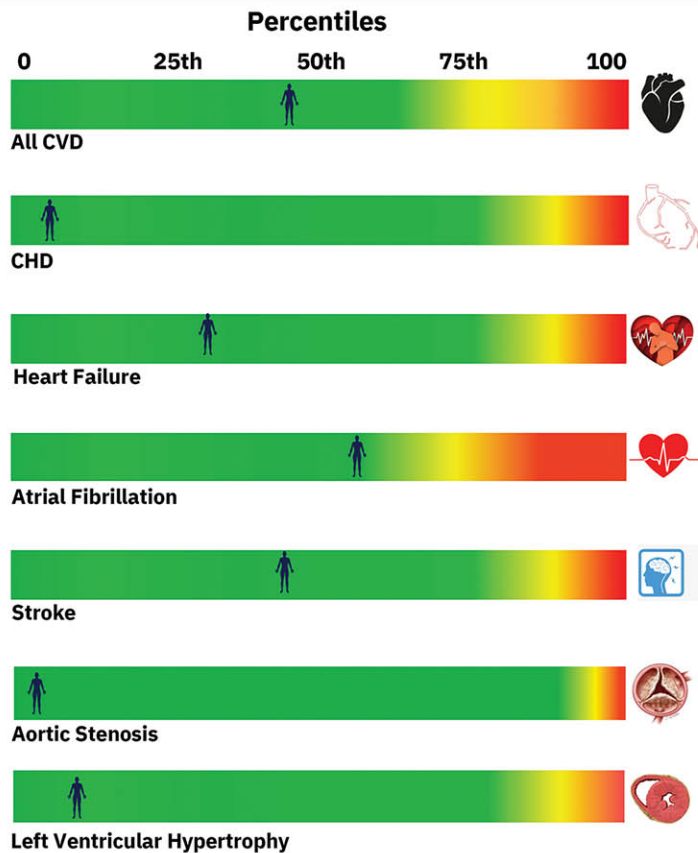


To learn more visit
www.HeartLung.ai

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

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HeartLung Technologies Co.

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

HeartLung's AI-CVD is the first and only FDA-cleared
AI-enabled CVD report generation system.