



SphygmoCor[®] XCEL

Vascular Biometric Monitor

Comprehensive Central Hemodynamics and Arterial Stiffness Insights For Full Visibility Into Cardiovascular Health

The SphygmoCor XCEL measures central and brachial blood pressures, providing insights into cardiovascular function. Additionally, it assesses vascular biomarkers, offering a comprehensive understanding of arterial stiffness and health. These advanced physiological measurements enable early detection of potential cardiovascular issues, guiding targeted interventions for maintaining or improving overall cardiovascular health.

“New methods that assess arterial pressure and flow dynamics, beyond focus on conventional upper-arm blood pressure, are needed”

Lancet Commission on Hypertension

BETTER DATA, BETTER OUTCOMES

SphygmoCor XCEL enables noninvasive measurement of the central aortic pressure waveform and vascular biomarkers that are indicative of cardiovascular health.

These measurements are particularly valuable in understanding the dynamics of arterial health and the impact of various cardiovascular conditions on the arterial system. It is often used in clinical research, as well as in clinical practice for patients with hypertension, cardiovascular disease, or other conditions affecting arterial function.

Pulse Wave Analysis (PWA)

Pulse wave analysis involves analyzing the characteristics of the arterial pulse wave. It goes beyond traditional blood pressure measurements by providing valuable insights into the elasticity and compliance of arterial walls. These measurements (shown below) offer a more comprehensive understanding of vascular health and can aid in the early detection of cardiovascular risk.

Pulse wave analysis is widely used in cardiovascular research to investigate the impact of various interventions, medications, and diseases on arterial function. It contributes to a better understanding of the pathophysiology of cardiovascular conditions.

Pulse Wave Velocity (PWV)

Pulse wave velocity is the speed at which the arterial pulse travels through the circulatory system, specifically between two defined points, typically from the aorta to peripheral arteries. It serves as a key indicator of arterial stiffness, as stiffer arteries transmit the pulse wave more rapidly. Elevated PWV is associated with increased cardiovascular risk and is considered an independent predictor of adverse cardiovascular events.

Monitoring PWV is instrumental in assessing vascular aging and guiding interventions aimed at preserving or improving overall cardiovascular health.

Parameter Quick Reference

		XCEL	Automated BP Monitor
 Heart Rate (HR)	The number of heart beats per minute and can indicate cardiac health and fitness levels.	✓	✓
 Brachial Blood Pressure	The pressure of blood in the brachial artery in the upper arm, an indicator of cardiovascular health.	✓	✓
 Central Blood Pressure (SP & DP)	The pressure of blood at the root of the aorta, providing a more accurate assessment of cardiovascular risk compared to brachial blood pressure alone.	✓	
 Central Pulse Pressure (PP)	Pressure experienced by the major organs such as the brain, kidney, and liver.	✓	
 Augmentation Pressure (AP)	The additional pressure exerted by the heart to overcome rigidity in the arterial wall, reflects both arterial stiffness and the extra workload on the heart.	✓	
 Augmentation Index (Alx)	A % measurement of your heart's workload due to arterial stiffness.	✓	
 Subendocardial Viability Ratio (SEVR)	The supply & demand of oxygenated blood to the myocardium.	✓	
 Pulse Pressure Amplification (PPA)	The increase in amplitude of arterial pulse waves as they travel from central to peripheral arteries, providing insights into arterial stiffness and blood flow efficiency.	✓	
 Pulse Wave Velocity (PWV)	The speed at which the arterial pulse travels through the circulatory system, a key indicator of arterial stiffness	✓	
 SphygmoCor Reference Age	Estimates arterial age based on central pressure and arterial stiffness parameters, providing a reference for comparison with healthy individuals.	✓	

FOUNDED ON 40 YEARS HEMODYNAMICS STUDIES, VALIDATED BY 20+ YEARS OF RESEARCH, AND TRUSTED BY RESEARCHERS WORLDWIDE.

SphygmoCor® Technology

Our pioneering technology was enabled by more than 40 years of hemodynamic studies of the cardiovascular system and set the foundation for noninvasive measurement of vascular biomarkers including central aortic pressures and arterial stiffness indices.

The SphygmoCor technology has been independently validated by researchers worldwide and supported studies that resulted in over 2,300 peer-reviewed publications.

Clinical Trials Expertise

Our team is composed of study management and technical support personnel who are experts in clinical trial execution (phases I-IV), arterial stiffness assessments and central pressure waveform analysis, as well as data management and site support.

We have supported clinical trial sponsors and sites around the globe, spanning a variety of therapeutic areas including hypertension, heart failure, chronic kidney disease, COPD, diabetes and more.

CONNECT Health
Cardiology Report (Oct 2024 - Jan 2025)

General Details

Name: Michaela Johnson
DOB: 08-Dec-1972 (52 yrs)
Sex: Female

Cardiovascular Risk Profile - Arterial Intelligence™

Low Cardiovascular Risk
All measurements are within the normal range.

Intermediate Cardiovascular Risk
1 or more measurements are above the normal range.

High Cardiovascular Risk
1 or more measurements are above thresholds.

Actions for Elevated Risk Levels

Measurements in the high-risk category (red) highlight areas that need attention, while those in the intermediate risk category (yellow) highlight areas that may benefit from intervention to help maintain cardiovascular health and reduce the likelihood of conditions like or coronary artery disease. You have specific risk factors present, may suggest further testing to explore how central blood pressure and/or other cardiovascular health (see page 5).

Yellow Zone: Intermediate Cardiovascular Risk

Focus on Lifestyle Changes

- Increase physical activity (e.g., 150 minutes of moderate exercise per week)
- Adopt a heart-healthy diet rich in fruits, vegetables, whole grains, and lean protein
- Reduce sodium intake to help manage blood pressure
- Maintain a healthy weight by balancing calorie intake and energy expenditure

Red Zone: High Cardiovascular Risk

Seek Medical Advice

- Consider a physician to review abnormal measurement follow-up with a specialist as needed for additional understanding of your cardiovascular risk.
- Discuss with your physician tests and treatments you can take to manage your risk and help your physician to detect and better understand the root cause of your elevated risk.

Start Treatment

- If possible, adhere to medical therapy for managing cholesterol, blood pressure, and other CV risk factors.

Implement Targeted Changes

- Work with a nutritionist or fitness specialist to optimize diet and exercise plan.
- Quit smoking and limit alcohol consumption.

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High Cardiovascular Risk
1 or more measurements are above thresholds.

Central Blood Pressure (SYS) is above a threshold of >130 mmHg.

Central Pulse Pressure is above a threshold of >50 mmHg.

Augmentation Pressure is >10 mmHg

Augmentation Index is >10% above the normal range for your age.

Pulse Pressure Amplification is <130%.

● Below/Within Range ● Above Range

Central Blood Pressure Trend

mmHg

140
135
130
125
120

Oct 11 Oct 26 Nov 10 Nov 25 Dec 10 Dec 25 Jan 9

For Your Protection

Summary

Parameter	Average**	Classification	Change vs First Report	Normal Range
Central Blood Pressure (SYS)	129 mmHg	Above Range	↓ 2	99-126*
Central Pulse Pressure	48 mmHg	Above Range	↓ 1	27-47*
Pulse Pressure Amplification	128 %		0	≥130
Brachial Blood Pressure (SYS/DIA)	135/82 mmHg	HTN Stage 1	↓ 12/ ↓ 7	<120/<80
Augmentation Pressure	29 mmHg	Above Range	↓ 8	5.2-17.8*
Augmentation Index	32 %	Within Range	↓ 3	20.7-43.7*
Subendocardial Viability Ratio	104 %	Below Range	↑ 6	136-187

*Normal range for a 52-year-old female. **Average of the last 3 measurements. Report ID: 328973893252088 was created on 16-Jan-2025 11:59 PM CST



Technical Specifications | Physical and Environmental

Operating Ambient Temperature	+15°C to 40°C (59°F to 104°F)		
Operating Relative Humidity	15% to 95% non-condensing		
Storage Ambient Temperature	-20°C to 65°C (-4°F to 149°F)		
Transport Ambient Temperature	-20°C to 65°C (-4°F to 149°F)		
Storage Relative Humidity	20% to 90% non-condensing		
Transport Relative Humidity	20% to 90% non-condensing		
External Power Supply	Input	100-240 VAC, 50-60Hz	
	Output	15VDC at 2A	
	Protective Class	IEC Class II, Double Insulated	
	Power Connector	4 PIN DIN	
Physical Specifications	Enclosure Material	Polycarbonate	
	Weight	0.7 kg (1.5 lbs)	
	Dimensions (EM4C)	9.9 (l) x 19 (w) x 17.2 (h) cm	
	Dimensions (Tray)	30.5(l) x 16.7 (w) x 8.6 (h) cm	
Measurement	NIBP	Oscillometric. Diastolic values correspond to Phase 5 Korotkoff sounds	
Range	NIBP, PWA	Sys: 50 - 260 mmHg Dia: 40 – 200 mmHg	
	PWV	2 to 25 m/s	
	Heart Rate	30 - 220 beats per minute	
	Display	0 - 300mmHg	
Resolution	1 mmHg		
Tonometer	Uncalibrated Pressure Transducer		

Recommended Minimum Computer Requirements

Type	IBM Compatible PC
Processor	Intel or compatible, Core i3, 32 or 64 bits
Nominal Speed	2.4 GHz minimum
Memory	2GB RAM minimum
Hard Disk Size	40 GB
	2GB for Installation
	10GB for database
Accessories	DVD drive, USB port
Printer Drivers	User Provided
Communications	USB port
Minimum Display Resolution	1366 x 768 pixels
Operating Systems	Windows 7 Professional + SP1, or Windows 8 Pro, or Windows 10 Professional

Regulatory Approvals

FDA Clearance	510(k) K122129
EU CE Mark	MDD, ANNEX II, Class IIa
Australia	TGA