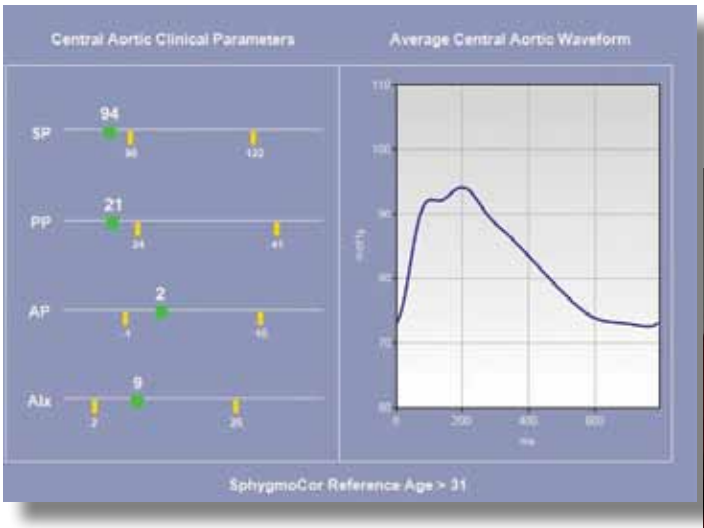
SphygmoCor XCEL

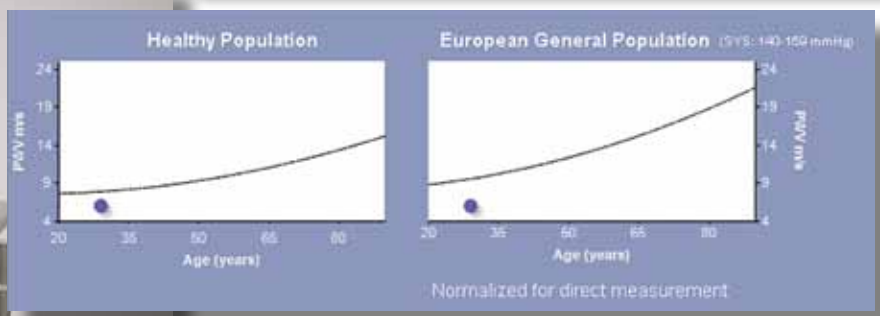
SIMPLY THE GOLD STANDARD

Managing cardiovascular risk with SphygmoCor XCEL



"Central pulse pressure better predicts outcome than does brachial pressure"

Roman et al., *Hypertension*, 2007; 50:197-203



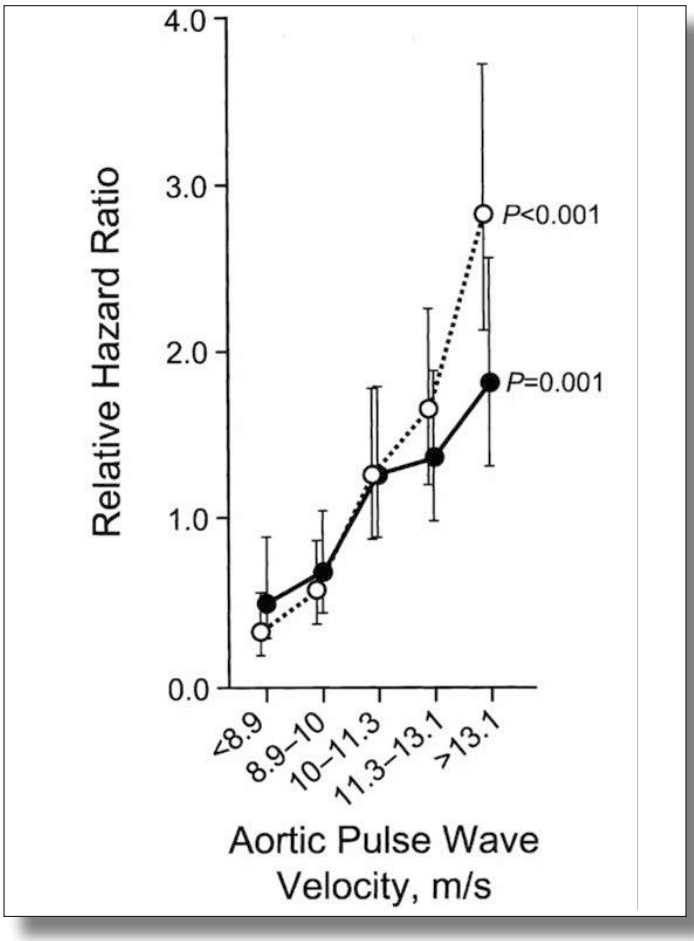
"Carotid to femoral Pulse Wave Velocity >12m/s is an indicator of end organ damage"

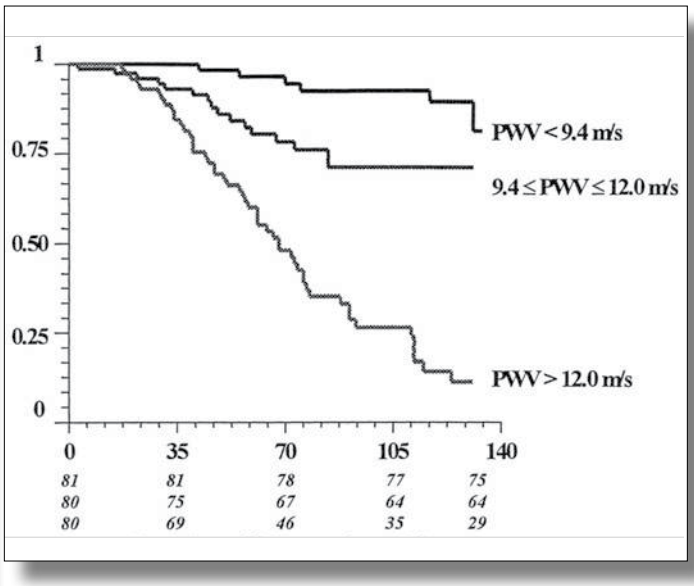
European Society of Hypertension guidelines 2007

Carotid-femoral PWV shown to be predictive of CV risk

"Aortic PWV improves (Framingham) risk prediction when added to standard risk factors and may represent a valuable biomarker of cardiovascular disease risk"

Mitchell, *Circulation.* 2010;121:505-511





"Aortic PWV is a strong independent predictor of all-cause and mainly cardiovascular mortality."

Blacher, *Circulation.* 1999;99:2434-2439

"For each 1-SD increment in aPWV, the risk of an event increased by 16% to 20%."

Willum Hansen, *Circulation*. 2006;113:664-670

"Although PWV may be determined between other sites, such as the brachial-ankle, it is important to recognize that these do not provide the same information as cf-PWV not least because they include different segments of muscular arteries and often concern 'indirect' pathways."

Artery Society Guidelines for the validation of non invasive devices, 2010

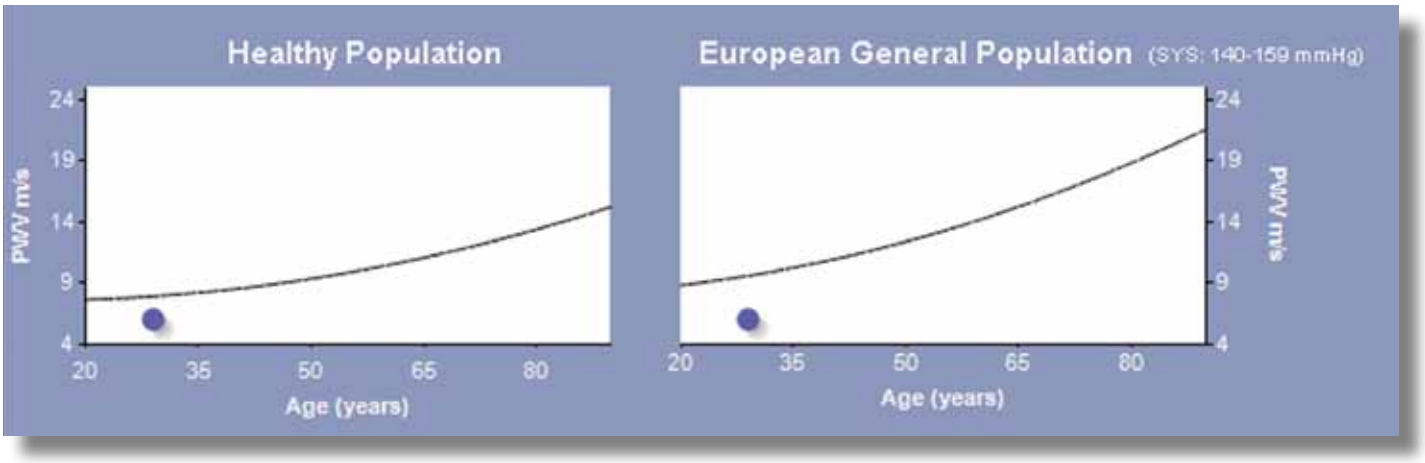
Measuring carotid-femoral PWV with SphygmoCor XCEL®

SphygmoCor XCEL
SIMPLY THE GOLD STANDARD

SphygmoCor XCEL

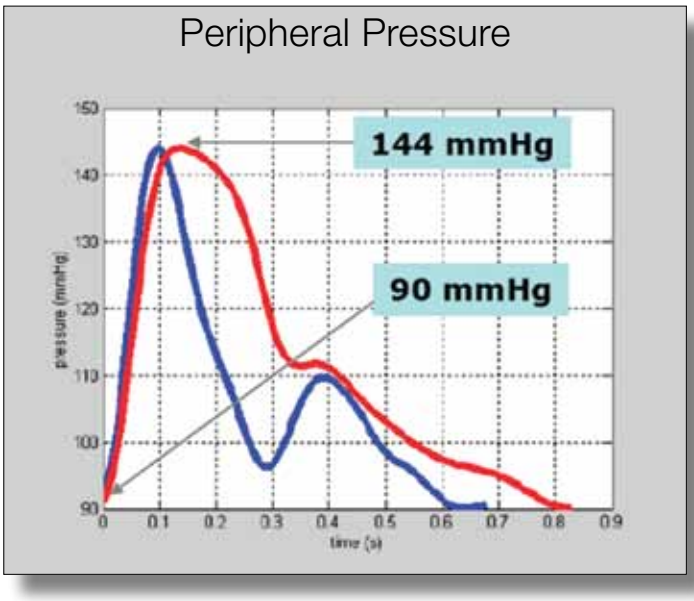
- Gold standard carotid femoral PWV
- Simultaneous measurement with thigh cuff and high fidelity tonometer
- PWV measurements in 60 seconds
- Data equivalency with earlier SphygmoCor systems:
  - average difference only 0.05m/s
  - Correlation of r=0.91
  - 1SD = 0.59m/s
- No undressing required
- Suitable for screening and epidemiological studies
- Risk stratification using healthy and normal reference ranges

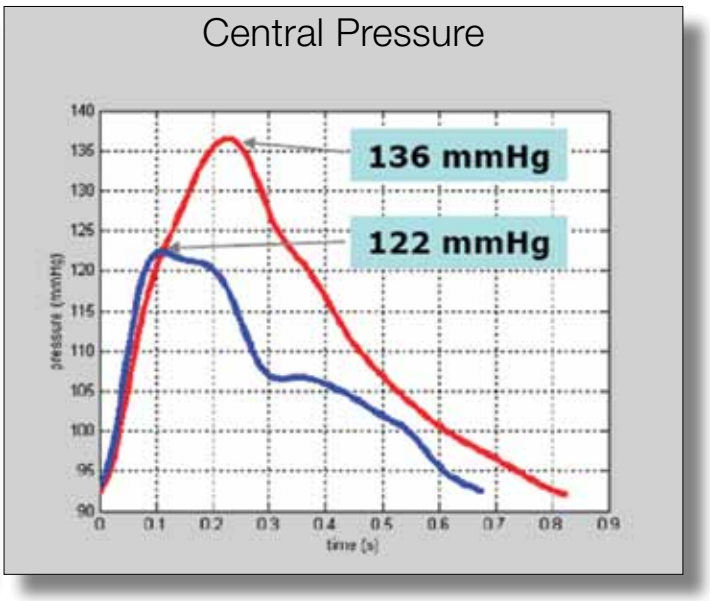
Aortic risk stratification by comparison to reference ranges



- Healthy population comparison - 4000 patients without traditional CV risk factors.
- European General population comparison - 11,092 patients without traditional CV risk factors, and stratified based on brachial blood pressure.
- Measurements below the line show a patient has cf-PWV that is lower than the average for their age.

Peripheral pressure and central aortic pressure are not the same

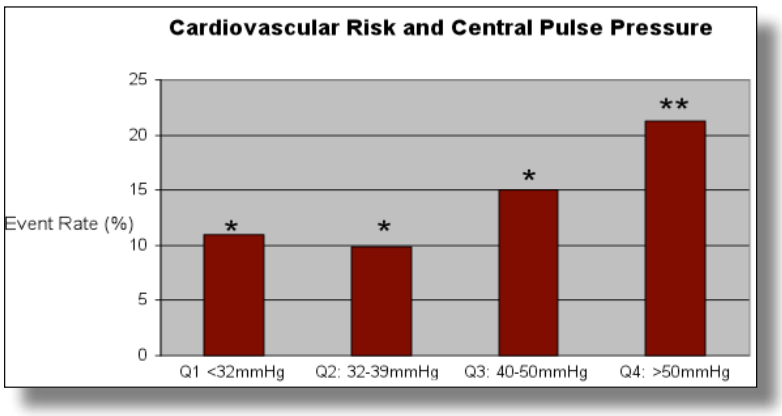




- **2 patients – similar cuff pressure of 144/90**
- **Very different central pressure – 136/91(red) and 122/90 (blue)**
- **Different cardiovascular risk based on Central systolic blood pressure and central pulse pressure**

> ***"Central pressure cannot be reliably inferred from peripheral pressure"***
>
> McEniery, et al. *Hypertension* 2008

Central pulse pressure defines a threshold for CV risk

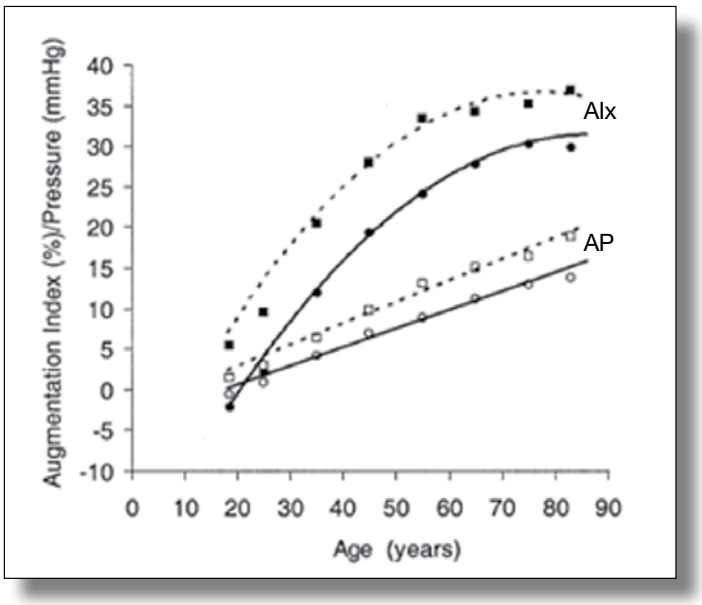


Roman, *JACC*, 2009

- ***Patients with Central Pulse Pressure ≥ 50mmHg had a 20% CV event rate.***
- ***Patients with Central Pulse Pressure < 50mmHg had a 10% CV event rate.***
- ***The highest quartile of Brachial pulse pressure did not demonstrate greater CV risk.***

> ***When central pulse pressure exceeds a threshold of 50mmHg, the risk of cardiovascular events in an individual doubles. Risk assessment using peripheral pressures does not show such a threshold.***

Augmentation index – indicator of arterial stiffness in younger patients.



McEniery, *JACC*, 2005.

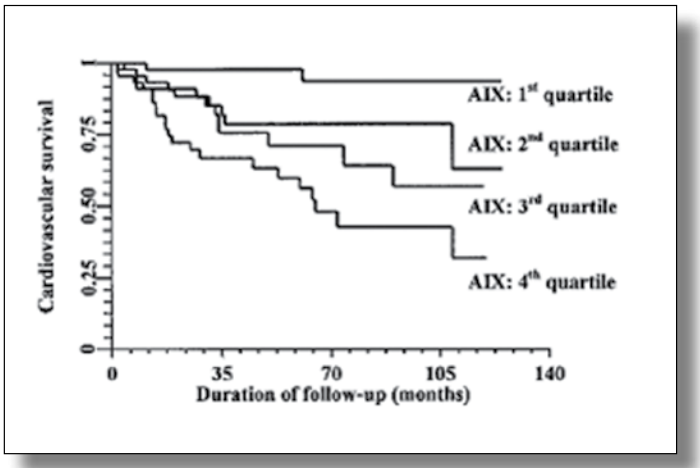
- **Augmentation index increases until the age of about 50, in both males (solid line) and females (dashed line)**
- **Augmented pressure increases linearly with age in males and females.**
- **Central AIx might be a more sensitive marker of arterial aging and CV risk in younger individuals, <50 years**

Augmentation index predicts clinical events independently of peripheral pressures

Vlachopoulos, European Heart Journal, 2010

Both Augmentation index and Central Systolic pressure should be measured.

Augmentation index – indicator of arterial stiffness in renal patients



London, *Hypertension*, 2001

"After adjustment for all confounding factors, the risk ratio for each 10% increase in augmentation index was 1.48 for CV mortality. These results provide the first direct evidence that in ESRF patients increased effect of arterial wave reflections is an independent predictor of all-cause and CV mortality."

London, *Hypertension*. 2001;38:434-438

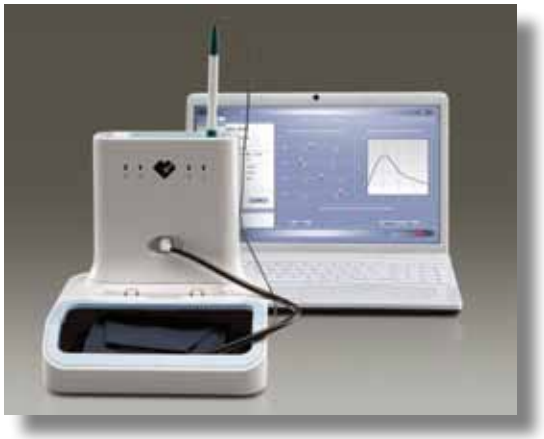
Framingham multiple variable risk score calculates high risk as 20% or more chance of event within 10 years. SphygmoCor Central Pulse pressure as a single variable predicts a 20% or more chance of event within 5 years.

Measuring Central Aortic Pressure with SphygmoCor XCEL

SphygmoCor XCEL
SIMPLY THE GOLD STANDARD

- Simple technique – Place cuff on arm and press “start”.
- Measurement in 60 seconds.
- Operator independent.
- SphygmoCor brachial generalized transfer function.
- Easy to use, intuitive software

Validation of SphygmoCor XCEL Central Aortic Pressure vs. SphygmoCor with tonometer waveform capture



Central systolic blood pressure

Average difference	0.5 mmHg ± 1.8 mmHg
R value (correlation)	r=.99

Central aortic pulse pressure

Average difference	0.5 mmHg ± 1.5 mmHg
R value (correlation)	r=.99

Central augmentation index

Average difference	1.8% ± 7%
R value (correlation)	r=.91

The estimation of aortic peak values and waveform features from the brachial cuff waveform is comparable to existing tonometric-based methods

Butlin, ESH Poster 2012, publication in print

SphygmoCor XCEL Specifications

Options	*SphygmoCor XCEL CBP* *SphygmoCor XCEL PWV* *SphygmoCor XCEL CBP and PWV*
Operating Ambient Temperature	*+15°C to 40°C (59°F to 104°F)*
Operating Relative Humidity	*15% to 95% non-condensing*
External Power Supply (use only AtCor part number 1-00877)	*100-240 VAC, 50-60Hz*
Physical Specifications	*Enclosure Material | Polycarbonate* *Weight | 0.7 kg (1.5 lbs)* *Dimensions | 9.9 (l) x 19 (w) x 17.2 (h) cm*
Range	*NIBP, PWV | Sys: 50 - 260 mmHg* *Dia: 40 - 200 mmHg* *Heart rate | 30 - 220 beats per minute*

Non invasive BP measurements provided by Suntech Advantage Mini validated to BHS and IEC standards

Minimum computer Specifications

Type	*IBM Compatible PC*
Processor	*Intel or compatible, 32 bits*
Nominal Speed	*2GHz minimum*
Memory	*1GB RAM minimum*
Hard Disk	*2GB for Installation* *10GB for database*
Accessories	*DVD drive*
Printer Drivers	*Standard*
Communications	*USB port*
Minimum Display Resolution	*1024 x 768 pixels*
Operating Systems	*Windows XP Professional + SP3, or Windows 7 Professional*

Contact Information

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