

# **The Assessment of Early Vascular Aging (EVA)**



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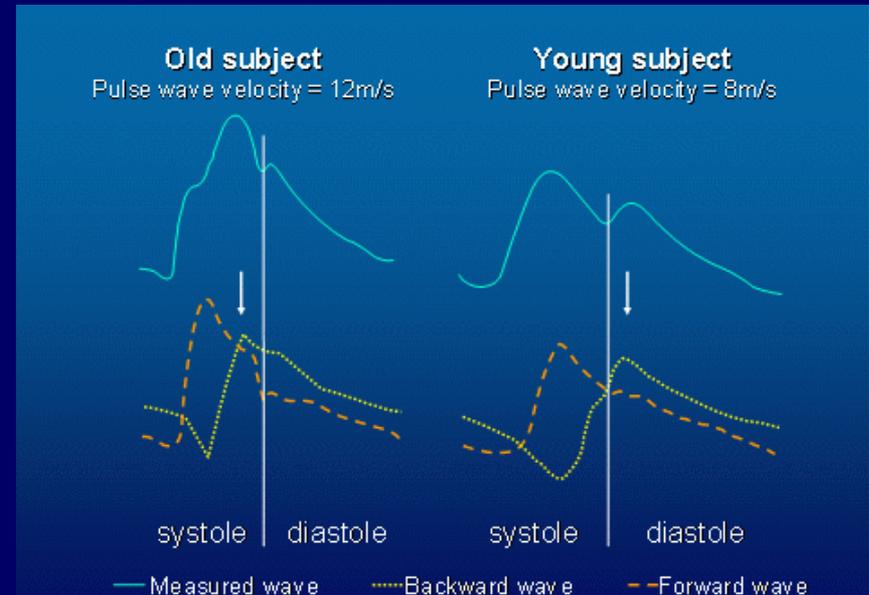
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# Arterial stiffness-definitions

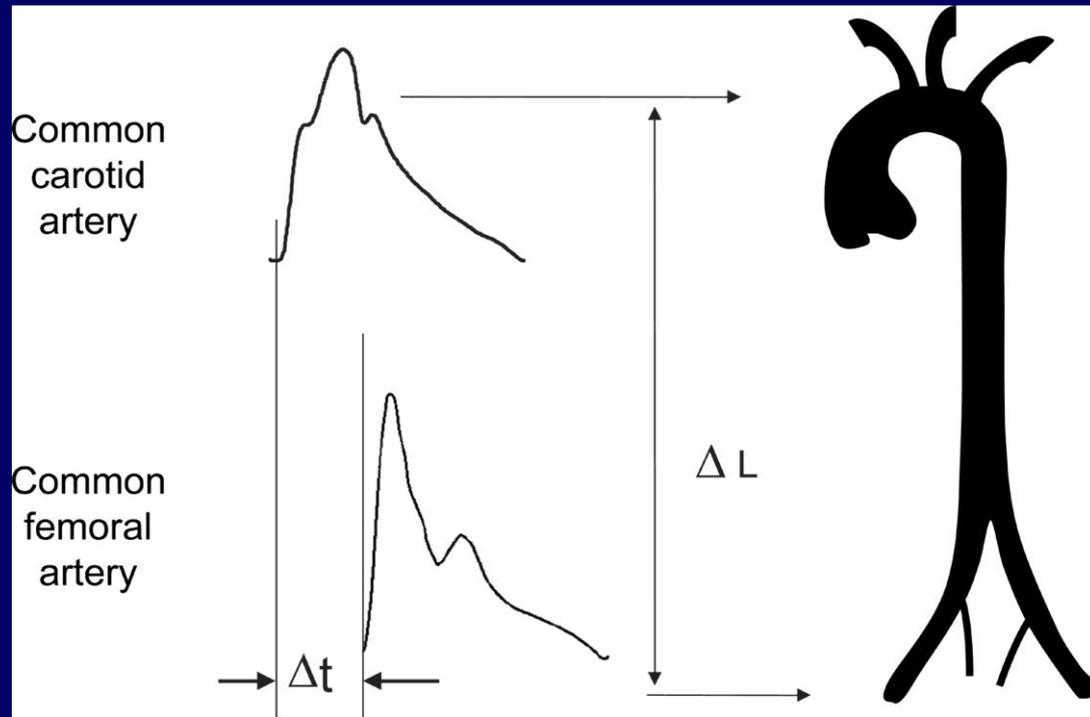
- Arterial stiffness is increased when elastic properties of the arterial wall are reduced
- Compliance is the ability of an artery to increase its volume in response to a given increase in blood pressure
- Pulse wave velocity (PWV) is the speed at which the pressure waveforms travel along the aorta and large arteries during each cardiac cycle
- Pulse wave velocity (PWV) is a direct measure of arterial stiffness

# Central blood pressure

- Central blood pressure is composed by two waves. A forward wave generated by ventricular ejection and a backward wave from the arterial tree
- In young subjects the reflected wave arrives in late systole and diastole, generating the typical "C-type" wave adding little to the systolic blood pressure
- In older subjects, increased pulse wave velocity causes the greater reflection to arrive at the central aorta in early systole, generating an early systolic inflection point (A-type wave) and boosting systolic blood pressure



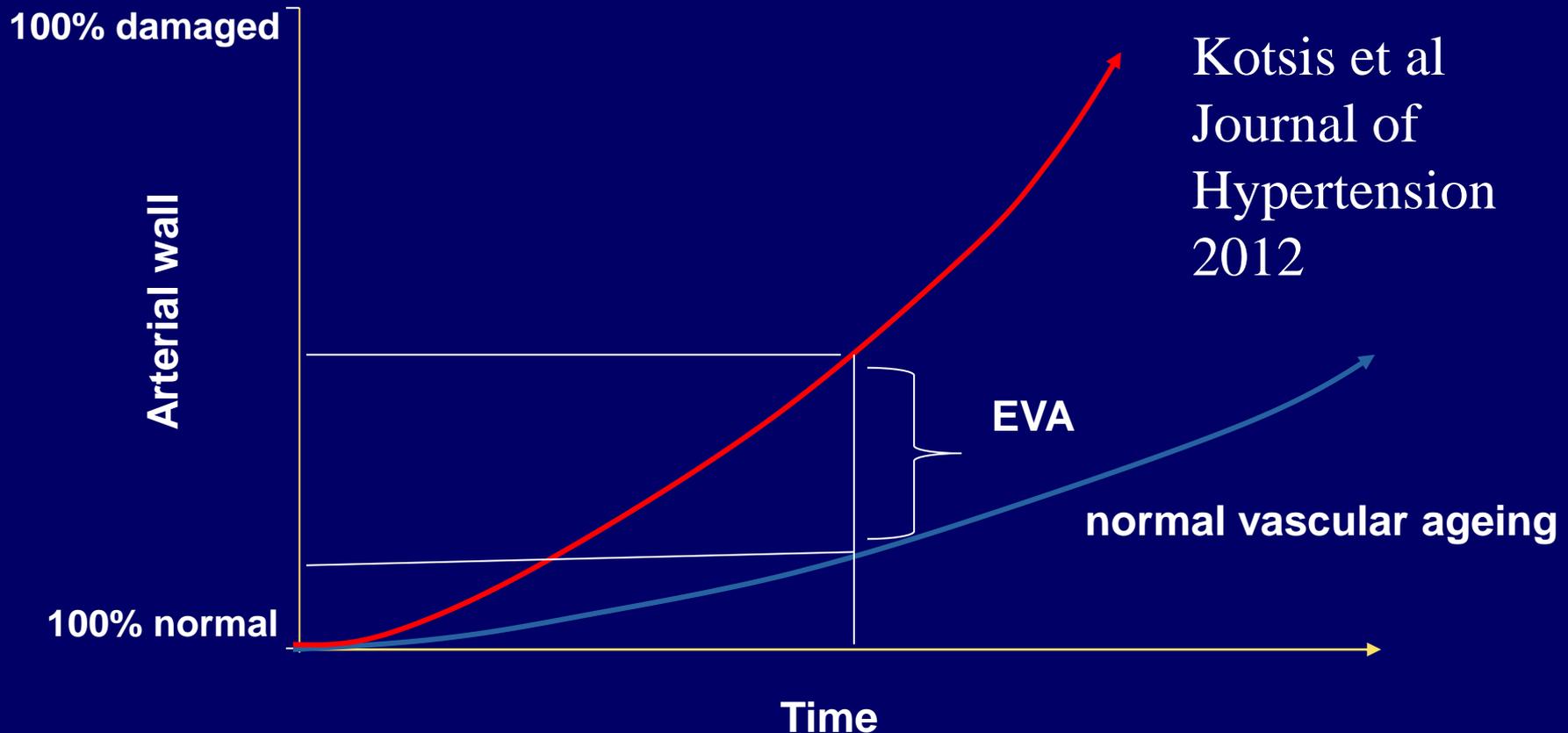
# Measurement of carotid-femoral pulse wave velocity (PWV) with the foot to foot method



$$PWV = D \text{ (meters)} / \Delta t \text{ (sec)}$$

- $D$  = the *distance* between the recording sites (carotid-femoral, carotid-radial)
- $\Delta t$  = *time delay or transit time* of the arterial pulse to transit between the recording sites

# How can we define early vascular ageing (EVA) from PWV



early vascular aging = the acceleration of vascular aging



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# Arterial stiffness and 24h ambulatory blood pressure monitoring in young healthy volunteers

**(EVA-ARIS Study)**



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# EVA-ARIS study

- 115 young healthy volunteers 15-30 years old
- Aim of the study was to estimate factors from ABPM and demographics that may associate with early vascular aging

# Conclusions

- **BP fluctuations, even in normal average BP range, are factors of early arteriosclerosis and may predict future cardiovascular events**

**24h ABPM is superior to predict arterial stiffness and EVA than clinic and home blood pressure measurements**

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- Thank you very much

