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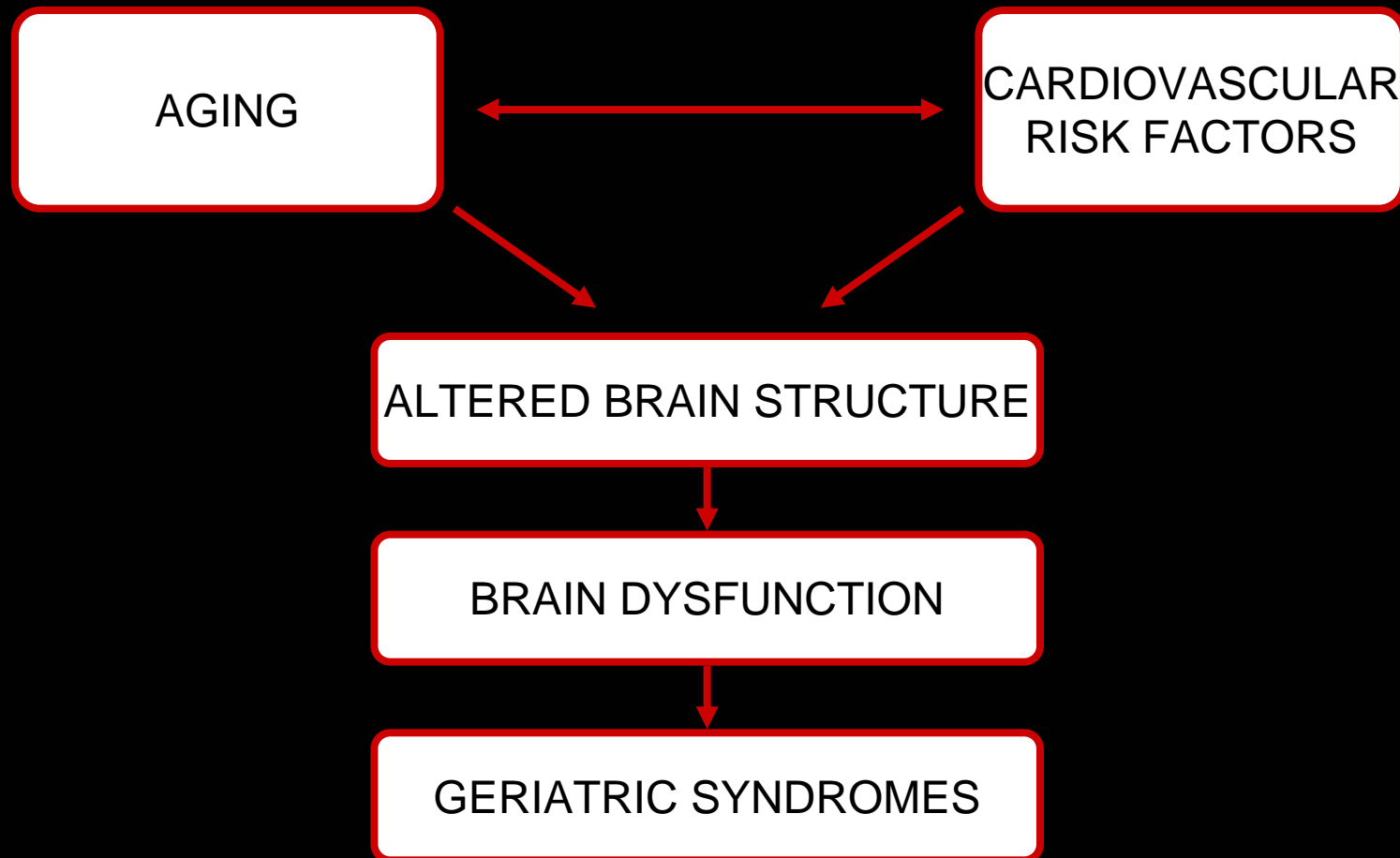
# VASCULAR AGING: Impact on Cerebral Blood Flow and Brain Function

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Andrew D. Robertson, Dr. Richard L. Hughson,  
Dr. Myra A. Fernandes and Dr. Eric A. Roy



# Do vascular changes influence characteristic changes in the aging brain?

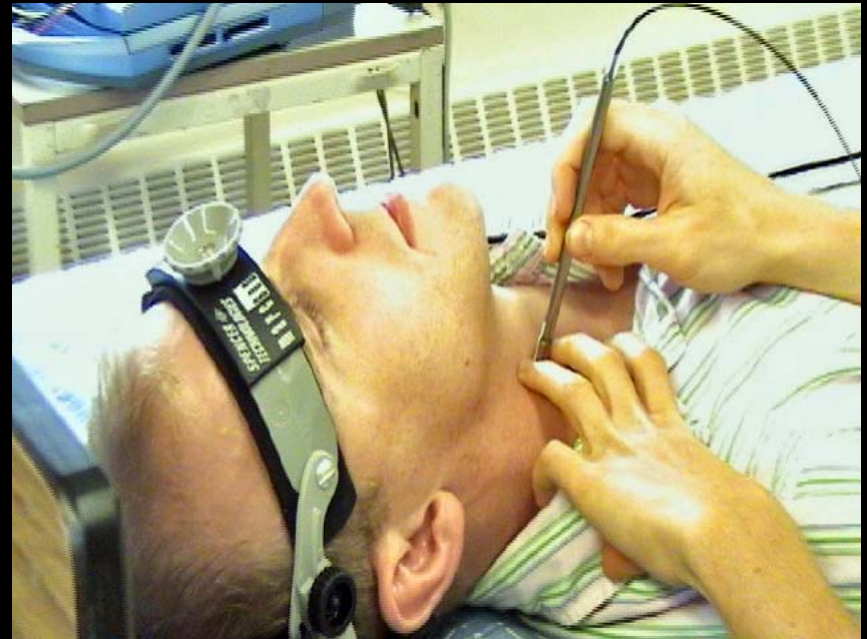


(modified from Pugh and Lipsitz, Neurobiology of Aging 23: 421-431, 2002)

# Hypothesis

Changes to the structure and function of main blood vessels will be associated with a reduction of cerebral blood flow and impairment of motor and cognitive function.

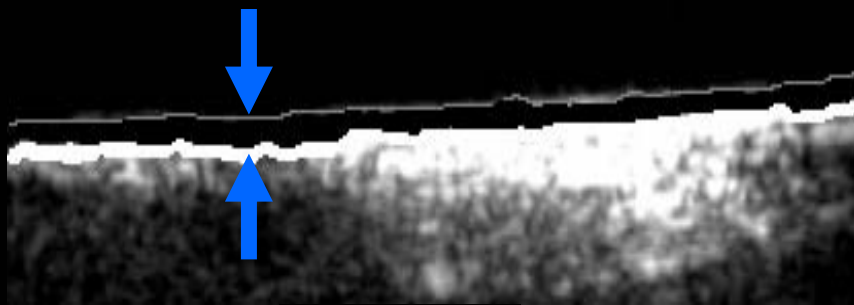
# A non-invasive method of obtaining indices of vascular health



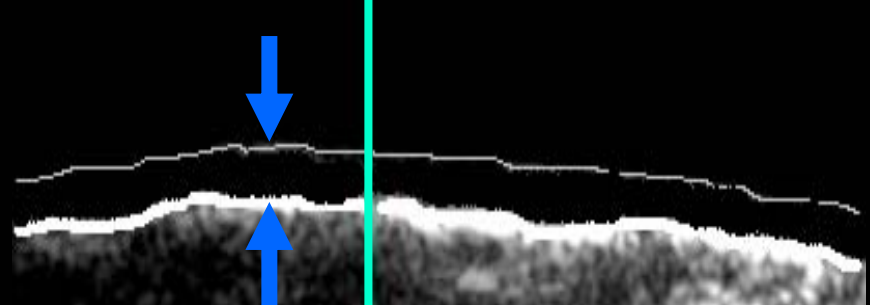
# Changing structure of main blood vessels is suggestive of downstream changes

- Intima-Media Thickness (IMT)

└─→ pre-clinical atherosclerotic plaques

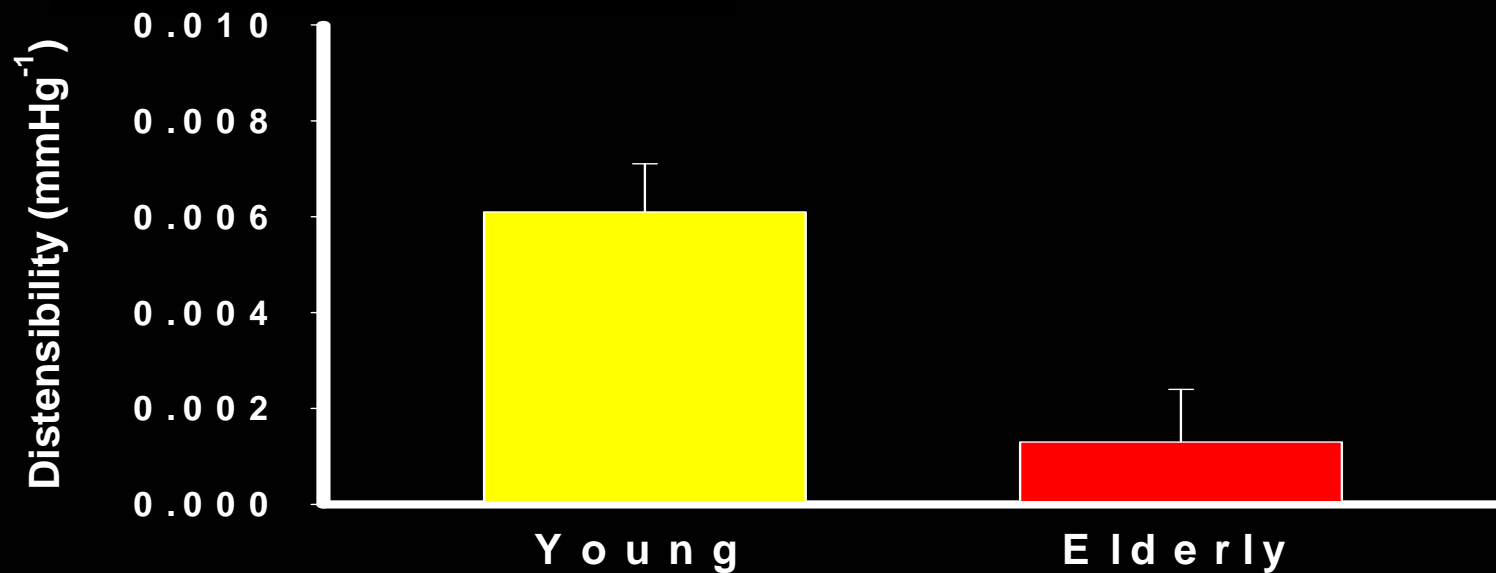
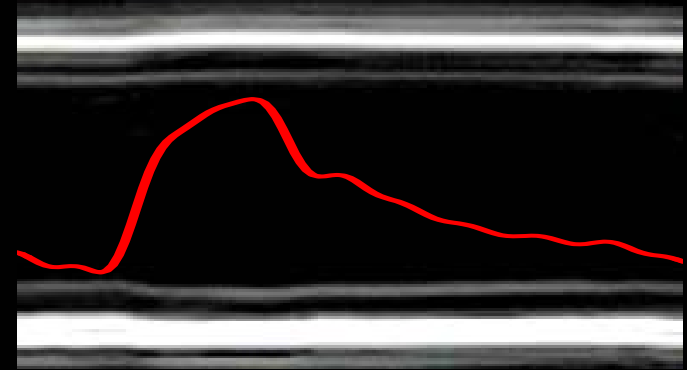
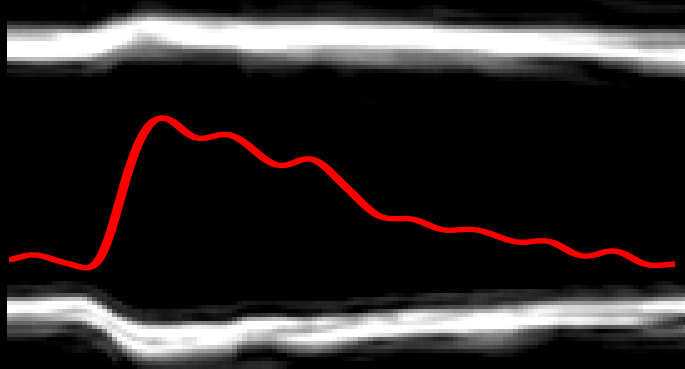


**YOUNG**

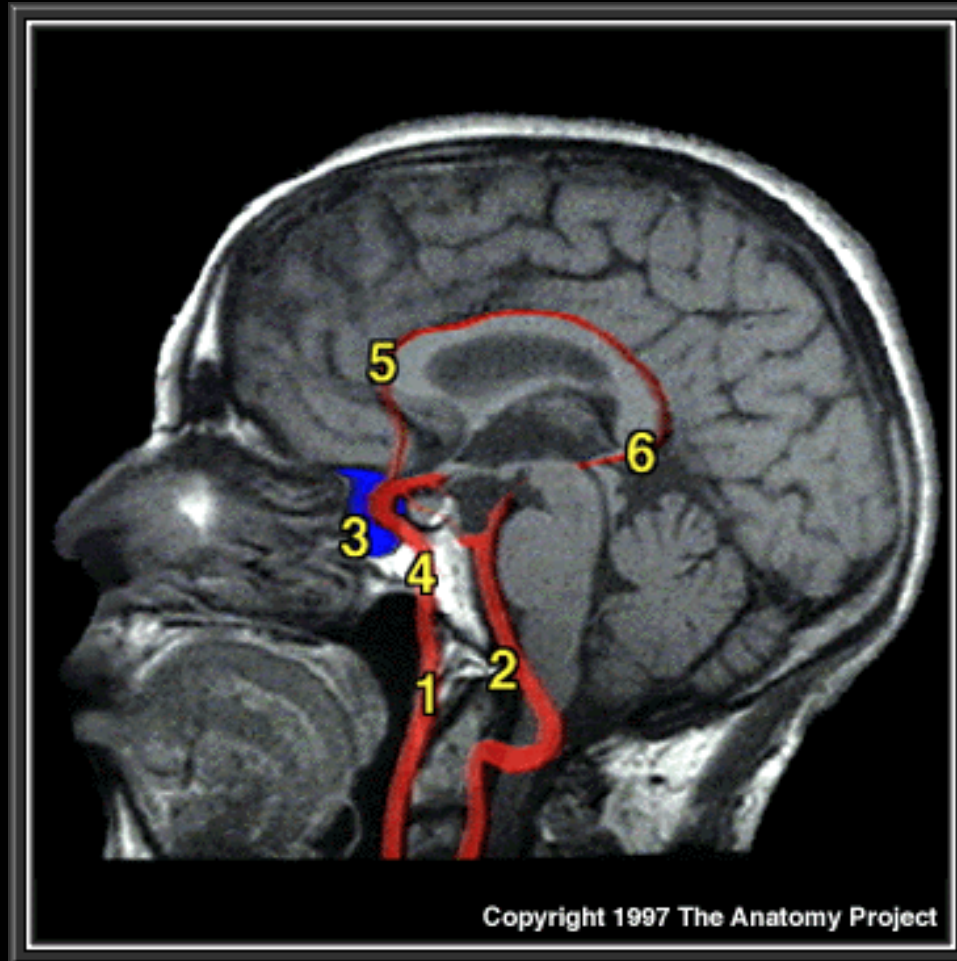


**ELDERLY**

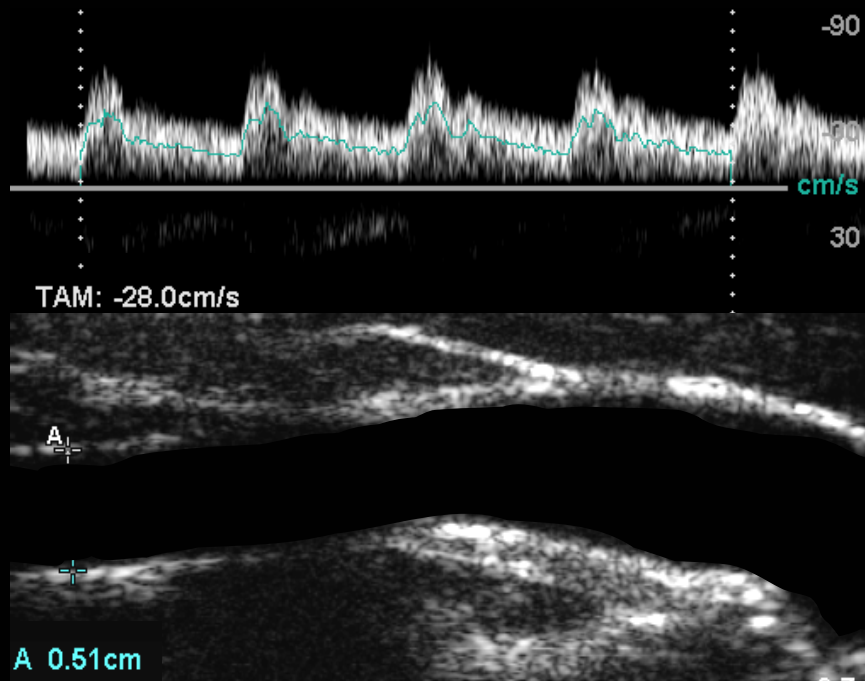
# Changing mechanics of main blood vessels impacts pressure and flow regulation



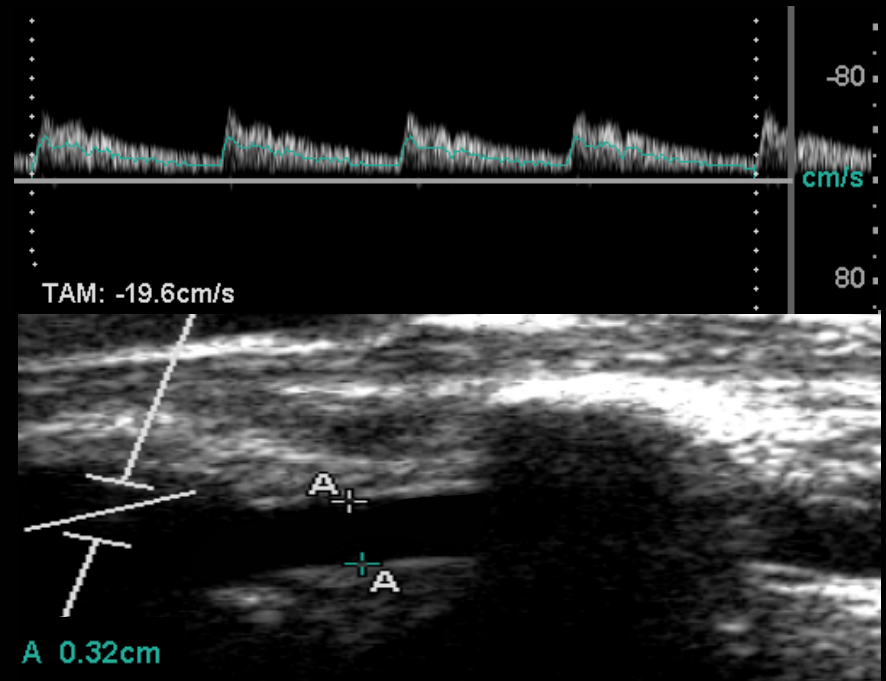
Blood to the brain is supplied by the internal carotid (1) and vertebral (2) arteries



# How much blood is getting to the brain?



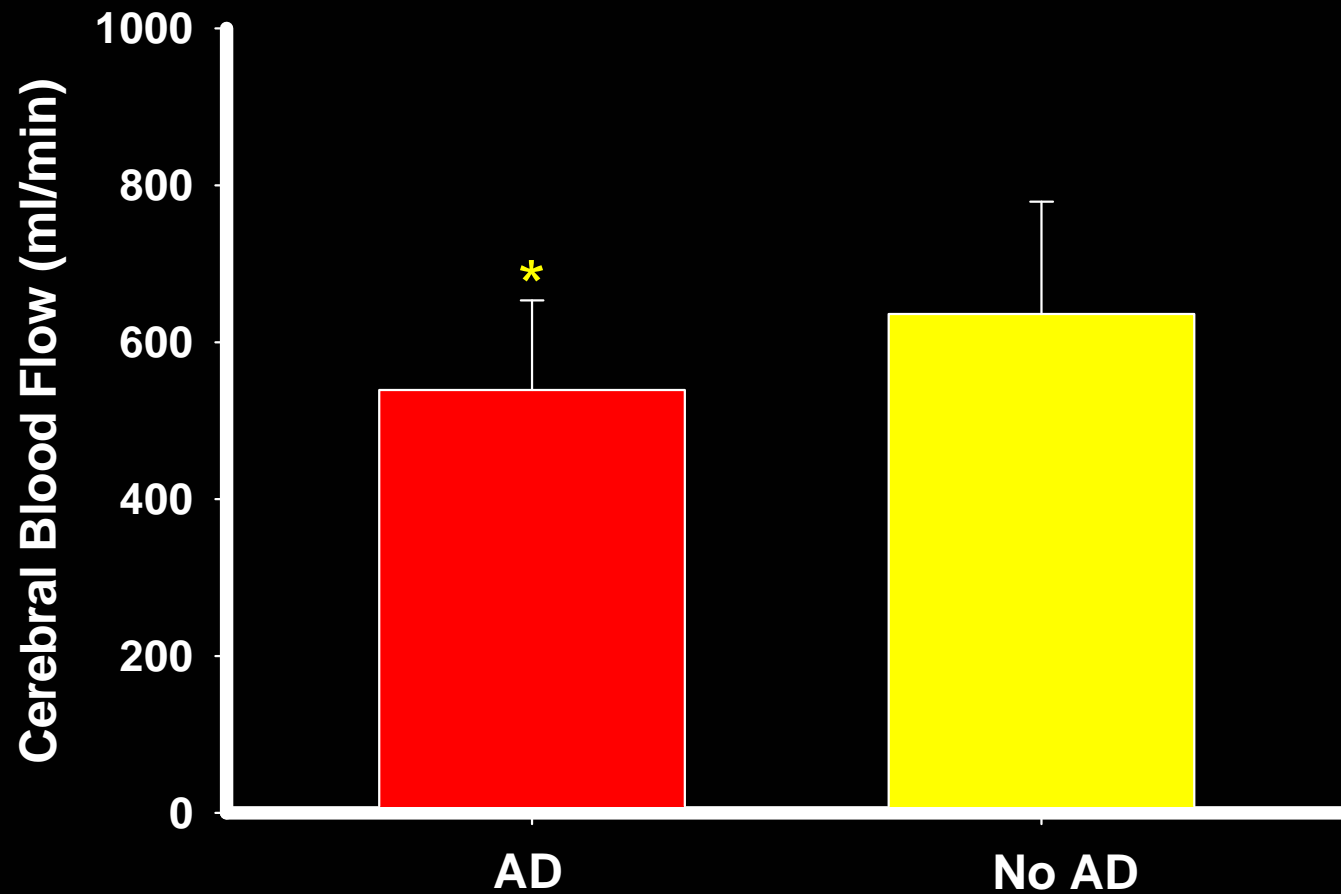
Internal Carotid Artery



Vertebral Artery

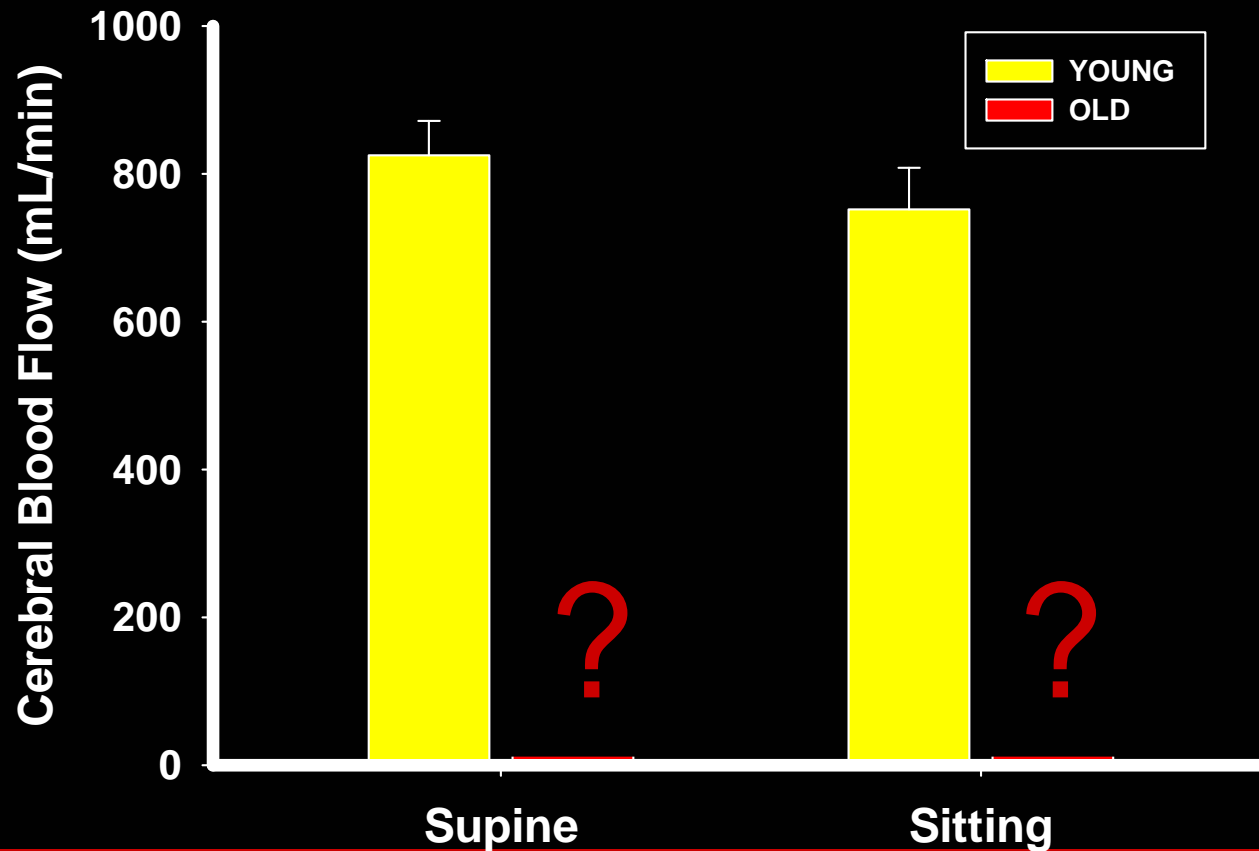
Total Volume Cerebral Blood Flow = RICA + LICA + RVA + LVA

Recent literature has demonstrated a relationship between cerebral blood flow and cognitive decline



(modified from Maalikjy-Akkawi et al., J Neurol 252: 559-563, 2005)

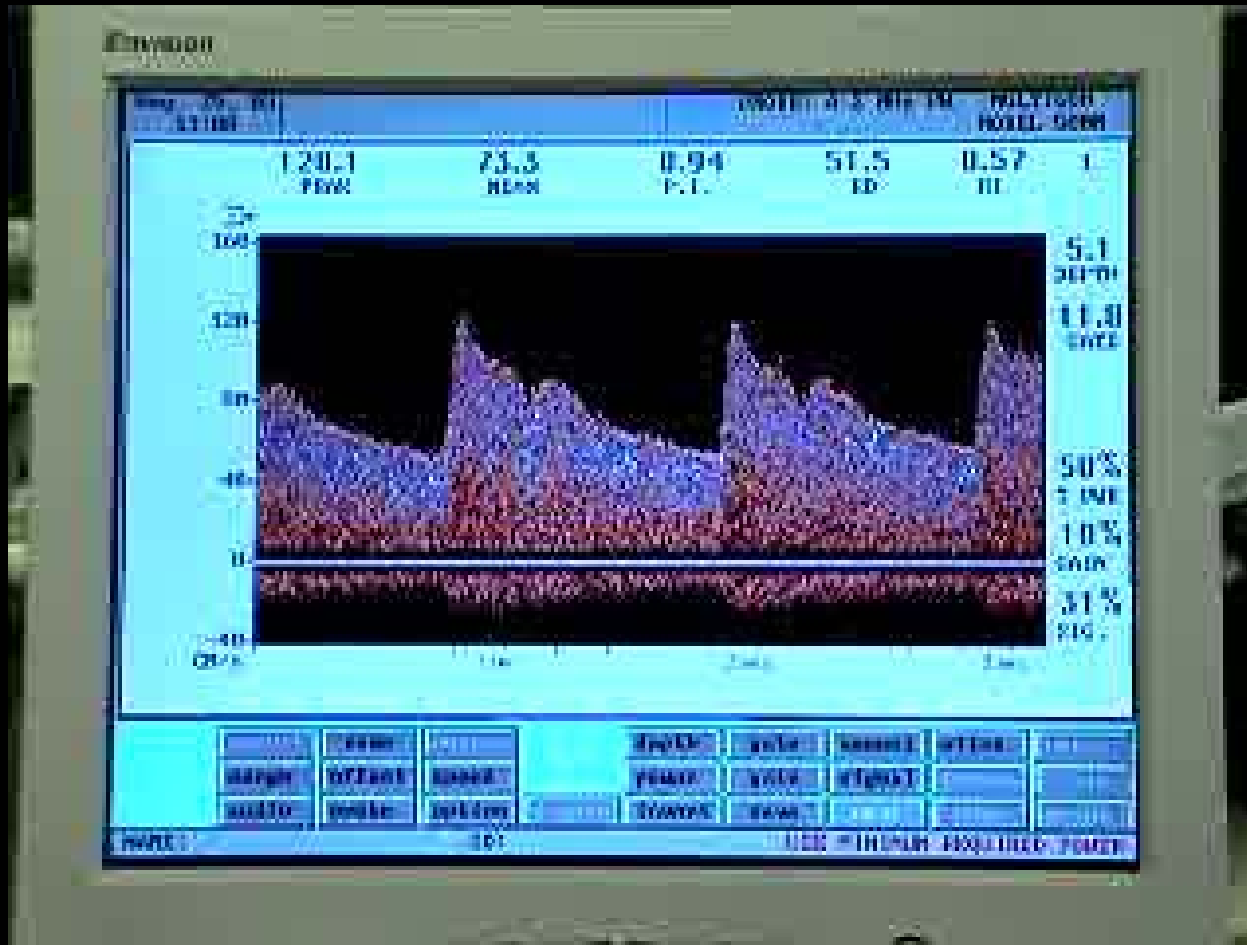
Is global cerebral blood flow more susceptible to the upright posture in the aged?



# Translating to practice

- Identification of risk factors early in the aging process
- Prevention/rehabilitation of cognitive and motor decline through a reduction in cardiovascular risk factors
- Reduction of the risk of fainting and falling by improved knowledge of changes in brain blood flow

# Dynamic change in red blood cell velocity through the middle cerebral artery in response to standing



# Acknowledgements

- Participants
- The students and staff in the Hughson Lab
- RBJ Schlegel-UW Research Institute for Aging

