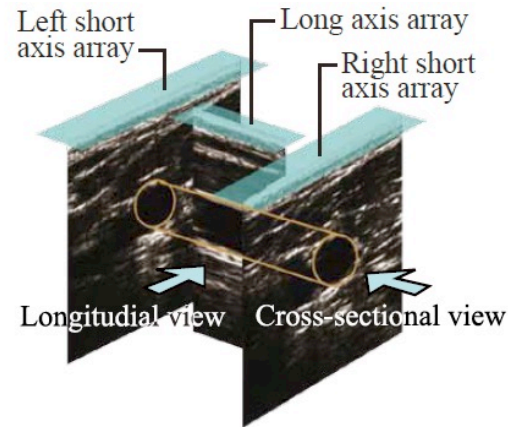
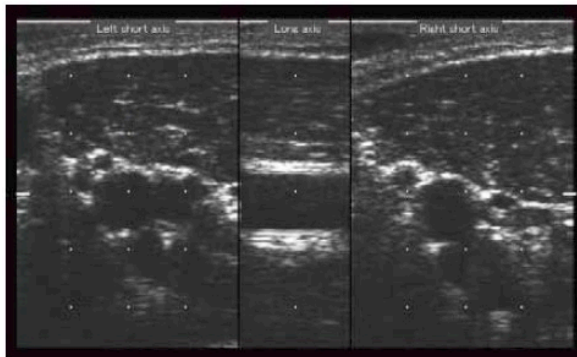


UNEX EF 38G

Measurement of endothelial function in the macrocirculation (semi-automated flow-mediated dilation)



Endothelial Function in Cardiovascular Precision Medicine: A Consensus Paper of the European Society of Cardiology Working Groups on Atherosclerosis and Vascular Biology, Aorta and Peripheral Vascular Diseases, Coronary Pathophysiology and Microcirculation, and Thrombosis

(2) FMD of the brachial arteries, the most commonly used measure of endothelial function, predicted cardiovascular risk in some large clinical trials but not others. Thus, we recommend that a consensus, **semi-automated methodology** is adopted in future studies to minimize technical variation, and that reference FMD values are established for different populations.

Expert consensus and evidence-based recommendations for the assessment of flow-mediated dilation in humans

Since diameter is a key determinant of FMD, the modality of measurement applied may influence results and, under all circumstances, should be kept the same throughout the experiment. Special attention should be paid to perform adequate scanning of the baseline diameter. More specifically, tangential scanning is a common error and results in underestimation of the true brachial artery diameter. **Recent technological advances, which adopt an H-shaped probe capturing two short-axis and one long-axis for automatic probe position correction, may overcome this crucial limitation.**

Eur Heart J. 2019 Aug 7;40(30):2534-2547.

UNEX EF 38G

Flow-mediated dilation (FMD)
(makrozirkulatorische EF)

Marker of endothelial function ✓

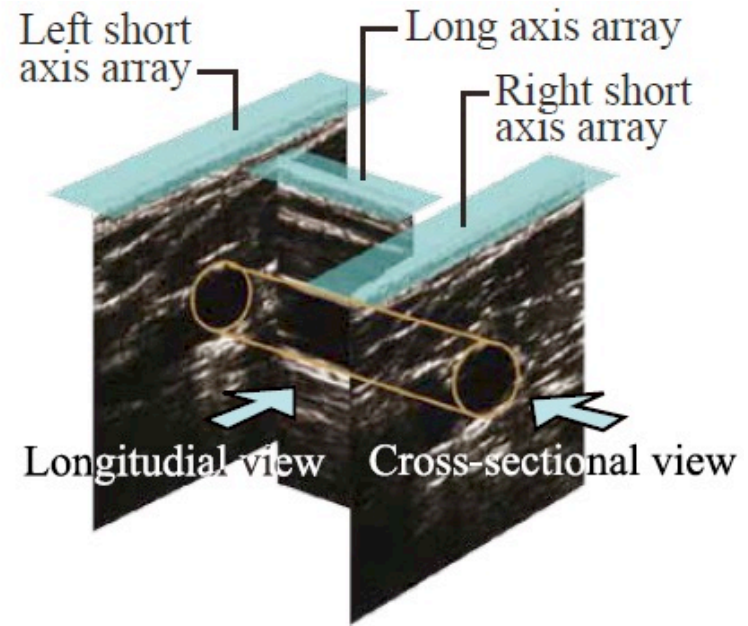
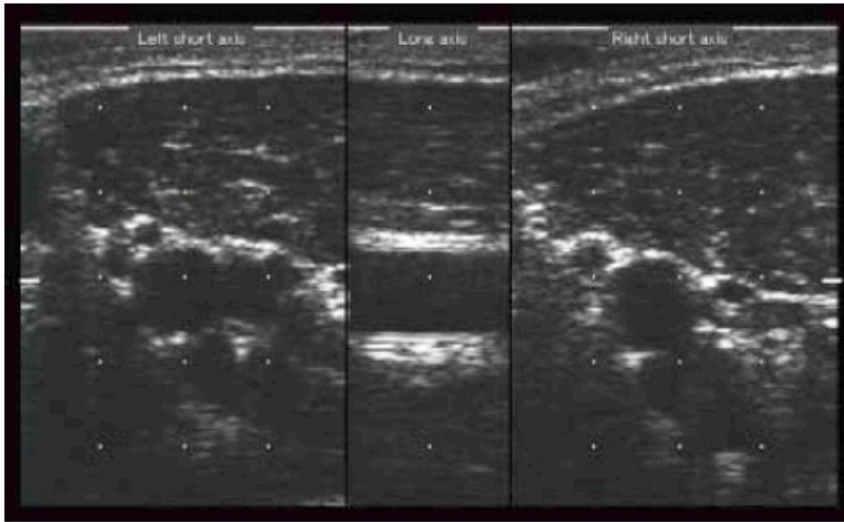
Reproducibility of results ✓

**Endorsement of leading
medical societies** ✓

Predictivity of events ✓

Norm values ✓





Contents lists available at [ScienceDirect](#)

Atherosclerosis

journal homepage: www.elsevier.com/locate/atherosclerosis

Reliability of measurement of endothelial function across multiple institutions and establishment of reference values in Japanese



In Study 1, assessment of FMD (scan recording and analysis) using an ultrasonographic semi-automatic measuring system (sFMD) was conducted at 18 participating institutions (sFMD-INST) (n 1/4 981). All of the brachial arterial scans were also analyzed at a core laboratory (sFMD-COLB). In Study 2, based on good-quality sFMD data **obtained from 6660 subjects without cardiovascular disease** (CVD) and 729 subjects with CVD from 27 institutions, reference values of sFMD are proposed by the Framingham risk score (FRS)-based risk categories and according to gender and age.

Atherosclerosis. 2015 Oct;242(2):433-42.

ORIGINAL RESEARCH

Diagnostic Criteria of Flow-Mediated Vasodilation for Normal Endothelial Function and Nitroglycerin-Induced Vasodilation for Normal Vascular Smooth Muscle Function of the Brachial Artery



We propose that the cutoff value for normal endothelial function assessed by FMD of the brachial artery is 7.1% and that the cutoff value for normal vascular smooth muscle function assessed by NID of the brachial artery is 15.6% in Japanese subjects.

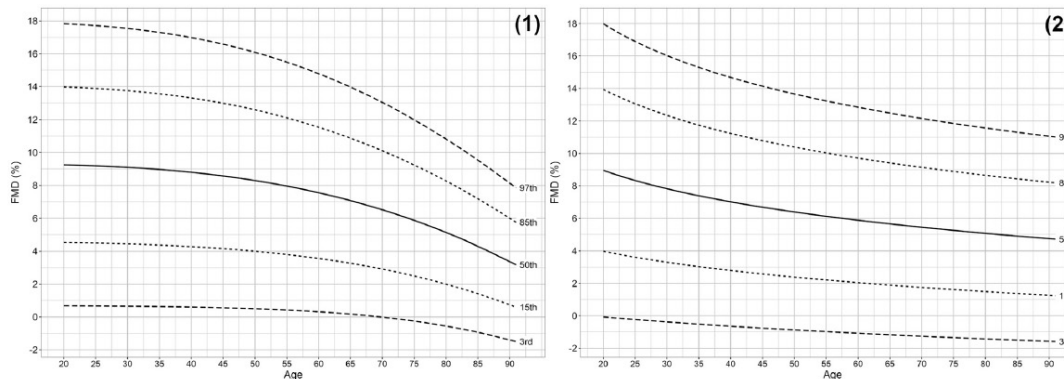
Endothelial function of healthy adults from 20 to 91 years of age: prediction of cardiovascular risk by vasoactive range

Karsten Königstein^a, Jonathan Wagner^a, Mirijam Frei^a, Raphael Knaier^a, Christopher Klenk^{a,b}, Justin Carrard^a, Achim Schwarz^c, Timo Hinrichs^a, and Arno Schmidt-Trucksäss^a

L-FMC, FMD and VAR were measured in 457 nonsmoking adults of 20–91 years without chronic diseases, medication, with normal heart function and very low cardiovascular risk.

Discriminatory cut-offs for elevated risk were 0.24% for L-FMC (sensitivity = 0.42, specificity = 0.67), 6.4% for FMD (sensitivity = 0.71, specificity = 0.60) and 6.3% for VAR (sensitivity = 0.62, specificity = 0.73).

(b) Percentiles of vasodilator responsiveness in healthy (1) female and (2) male adults



OPEN

Original article

Validation of semi-automated flow-mediated dilation measurement in healthy volunteers

Laurence J. Dobbie^a, Sharon T. Mackin^a, Katrina Hogarth^a,
Frances Lonergan^a, Dennis Kannenkeril^b, Katriona Brooksbank^a and
Christian Delles^a

Forty-three healthy volunteers had two brachial artery FMD measurements performed 20 minutes apart using the UNEX EF 38G device, and automated outputs were produced.

... manually analysed scans had excellent reproducibility and low measurement variance (ICCC = 0.815, CV = 11.40%)

... semi-automatic devices such as UNEX EF should be used by experienced investigators to achieve optimal results.

Blood Press Monit. 2020 Aug;25(4):216-223



ELSEVIER

Contents lists available at ScienceDirect

International Journal of Cardiology

journal homepage: www.elsevier.com/locate/ijcard

Longitudinal association among endothelial function, arterial stiffness and subclinical organ damage in hypertension☆



(PWV / CIMT / FMD) were measured three times at 1.5-year intervals in 674 Japanese patients receiving antihypertensive treatment.

In hypertension, endothelial dysfunction was associated with the progression of arterial stiffness, although the reverse association was not confirmed. The increased arterial stiffness rather than endothelial dysfunction may be more closely associated with the progression of atherosclerotic vascular damage, and the endothelial dysfunction-arterial stiffness-atherosclerosis continuum may be important in hypertension.

Int J Cardiol. 2018 Feb 15;253:161-166



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