

repository@rcsi.com

Computer aided diagnosis of early vascular disease from ultrasound images

AUTHOR(S)

Liam N. Kavanagh

CITATION

Kavanagh, Liam N. (2016): Computer aided diagnosis of early vascular disease from ultrasound images. figshare. Thesis. https://doi.org/10.25419/rcsi.10817621.v1

DOI

10.25419/rcsi.10817621.v1

LICENCE

CC BY-NC-SA 4.0

This work is made available under the above open licence by RCSI and has been printed from https://repository.rcsi.com. For more information please contact repository@rcsi.com URL

https://repository.rcsi.com/articles/Computer_aided_diagnosis_of_early_vascular_disease_from_ultrasound_i mages/10817621/1

References

Adji A, O'Rourke MF, Namasivayam M. Arterial stiffness, its assessment, prognostic value, and implications for treatment. Am J Hypertens. 2011 Jan;24(1):5-17. doi: 10.1038/ajh.2010.192. Epub 2010 Sep 9.

Agewall S, Doughty RN, Bagg W, Whalley GA, Braatvedt G, Sharpe N. Comparison of ultrasound assessment of flow-mediated dilatation in the radial and brachial artery with upper and forearm cuff positions. Clin Physiol. 2001 Jan;21(1):9-14.

Aldrich JE. Basic Physics of Ultrasound Imaging. Crit Care Med. 2007;35(5):S131-137.

Amato M, Montorsi P, Ravani A, Oldani E, Galli S, Ravagnani PM, Tremoli E, Baldassarre D. Carotid intima-media thickness by B-mode ultrasound as surrogate of coronary atherosclerosis: correlation with quantitative coronary angiography and coronary intravascular ultrasound findings. Eur Heart J. 2007 Sep;28(17):2094-101. Epub 2007 Jun 27.

Amato M, Frigerio B, Castelnuovo S, Ravani A, Sansaro D, Tremoli E, Squellerio I, Cavalca V, Veglia F, Sirtori CR, Werba JP, Baldassarre D. Effects of smoking regular or light cigarettes on brachial artery flow-mediated dilation. Atherosclerosis. 2013 May;228(1):153-60. doi:

10.1016/j.atherosclerosis.2013.02.037. Epub 2013 Mar 13.

American College of Obstetricians and Gynecologists' Task Force on Hypertension in Pregnancy. Hypertension in pregnancy. Obstet Gynecol 2013; 122:1122.

Anderson TJ, Uehata A, Gerhard MD, Meredith IT, Knab S, Delagrange D, Lieberman EH, Ganz P, Creager MA, Yeung AC, et al. Close relation of endothelial function in the human coronary and peripheral circulations. J Am Coll Cardiol. 1995 Nov 1;26(5):1235-41.

Antonini-Canterin F, Carerj S, Di Bello V, Di Salvo G, La Carrubba S, Vriz O, Pavan D, Balbarini A, Nicolosi GL; Research Group of the Italian Society of Cardiovascular Echography (SIEC). Arterial stiffness and ventricular stiffness: a couple of diseases or a coupling disease? A review from the cardiologist's point of view. Eur J Echocardiogr. 2009 Jan;10(1):36-43. doi: 10.1093/ejechocard/jen236. Epub 2008 Sep 16.

Asmar R, Benetos A, Topouchian J, Laurent P, Pannier B, Brisac AM, Target R, Levy BI. Assessment of arterial distensibility by automatic pulse wave velocity measurement. Validation and clinical application studies. Hypertension. 1995 Sep;26(3):485-90.

Awad J, Krasinski A, Parraga G, Fenster A. Texture analysis of carotid artery atherosclerosis from three-dimensional ultrasound images. Med Phys. 2010 Apr;37(4):1382-91.

Baldassarre D, Amato M, Bondioli A, Sirtori CR, Tremoli E. Carotid artery intima-media thickness measured by ultrasonography in normal clinical practice correlates well with atherosclerosis risk factors. Stroke. 2000 Oct;31(10):2426-30.

Barenbrock M, Kosch M, Jöster E, Kisters K, Rahn KH, Hausberg M. Reduced arterial distensibility is a predictor of cardiovascular disease in patients after renal transplantation. J Hypertens. 2002 Jan;20(1):79-84.

Bathala L, Mehndiratta MM, Vijay K. Sharma. Cerebrovascular ultrasonography: Technique and common pitfalls. Ann Indian Acad Neurol. 2013 Jan-Mar; 16(1): 121–127.

Baun J. Physical Principles of General and Vascular Sonography. 2009. Chapter 14, 195-203.

Behar V, Adam D, Friedman Z. A new method of spatial compounding imaging. Ultrasonics. 2003 Jul;41(5):377-84.

Betik AC, Luckham VB, Hughson RL. Flow-mediated dilation in human brachial artery after different circulatory occlusion conditions. Am J Physiol Heart Circ Physiol. 2004 Jan;286(1):H442-8. Epub 2003 Aug 28.

Bjällmark A, Lind B, Peolsson M, Shahgaldi K, Brodin LA, Nowak J. Ultrasonographic strain imaging is superior to conventional non-invasive measures of vascular stiffness in the detection of age-dependent differences in the mechanical properties of the common carotid artery. Eur J Echocardiogr. 2010 Aug;11(7):630-6. doi: 10.1093/ejechocard/jeq033. Epub 2010 Mar 25.

Bland JM, Altman DG. Statistical methods for assessing agreement between two methods of clinical measurement. Lancet. 1986 Feb 8;1(8476):307-10.

Blauuw J, Graaff R, van Pampus MG, van Doormaal JJ, Smit AJ, Rakhorst G,

Aarnoudse LG. Abnormal endothelium-dependent microvascular reactivity in

recently preeclamptic women. Obstet Gynecol 2005 105(3):626-32.

Blaauw J, van Pampus MG, Van Doormaal JJ, Fokkema MR, Fidler V, Smit AJ, Aarnoudse JG. Increased intima-media thickness after early-onset preeclampsia. Obstet Gynecol. 2006 Jun;107(6):1345-51.

Blaauw J, Souwer ET, Coffeng SM, Smit AJ, van Doormaal JJ, Faas MM, van Pampus MG. Follow up of intima-media thickness after severe early-onset preeclampsia. Acta Obstet Gynecol Scand. 2014 Dec;93(12):1309-16. doi: 10.1111/aogs.12499. Epub 2014 Sep 30.

Blacher J, Pannier B, Guerin AP, Marchais SJ, Safar ME, London GM. Carotid arterial stiffness as a predictor of cardiovascular and all-cause mortality in endstage renal disease. Hypertension. 1998 Sep;32(3):570-4.

Bollinger CT, Herth FJF, Mayo PH, Miyazawa T, Beamis JF. Clinical Chest Ultrasound, From the ICU to the Bronchoscopy Suite. 2009 1st edition. Chapter 1, 2-11, 2009.

Bonetti PO, Lerman LO, Lerman A. Endothelial dysfunction: a marker of atherosclerotic risk. Arterioscler Thromb Vasc Biol. 2003 Feb 1;23(2):168-75.

Bots ML, Hoes AW, Koudstaal PJ, Hofman A, Grobbee DE. Common carotid intima-media thickness and risk of stroke and myocardial infarction: the Rotterdam Study. Circulation. 1997 Sep 2;96(5):1432-7.

Bots ML, Evans GW, Riley WA, Grobbee DE. Carotid intima-media thickness measurements in intervention studies: design options, progression rates, and sample size considerations: a point of view. Stroke. 2003 Dec;34(12):2985-94. Epub 2003 Nov 13.

Boutouyrie P, Germain DP, Tropeano AI, Laloux B, Carenzi F, Zidi M, Jeunemaitre X, Laurent S. Compressibility of the carotid artery in patients with pseudoxanthoma elasticum. Hypertension. 2001 Nov;38(5):1181-4.

Bramwell JC, Hill AV. Velocity of transmission of the pulse-wave and elasticity of the arteries. Lancet.1922; i:891–2.

Brown MC, Best KE, Pearce MS, Waugh J, Robson SC, Bell R. Cardiovascular disease risk in women with pre-eclampsia: systematic review and meta-analysis. Eur J Epidemiol. 2013 Jan;28(1):1-19. doi: 10.1007/s10654-013-9762-6. Epub 2013 Feb 9.

Bunce SM, Hough AD, Moore AP. Measurement of abdominal muscle thickness using M-mode ultrasound imaging during functional activities. Technical and Measurement Report. Man Ther. 2004 Feb;9(1)41-44.

Burns AT, McDonald IG, Thomas JD, Macisaac A, Prior D. Doin' the twist: new tools for an old concept of myocardial function. Heart. 2008 Aug;94(8):978-83. doi: 10.1136/hrt.2007.120410.

Cai H, Harrison DG. Endothelial dysfunction in cardiovascular diseases: the role of oxidant stress. Circ Res. 2000 Nov 10;87(10):840-4.

Cannesson M, Tanabe M, Suffoletto MS, Schwartzman D, Gorcsan J 3rd. Velocity vector imaging to quantify ventricular dyssynchrony and predict response to cardiac resynchronization therapy. Am J Cardiol. 2006 Oct 1;98(7):949-53. Epub 2006 Aug 15.

Carallo C, Irace C, Pujia A, De Franceschi MS, Crescenzo A, Motti C, Cortese C, Mattioli PL, Gnasso A. Evaluation of common carotid hemodynamic forces. Relations with wall thickening. Hypertension. 1999 Aug;34(2):217-21.

Caro CG, Fitz-Gerald JM, Schroter RC. Atheroma and arterial wall shear: observation, correlation and proposal of a shear dependent mass transfer mechanism for atherogenesis. Proc R Soc Lond B Biol Sci. 1971 Feb;177(46):109-59. Carson PL, Fenster A. Anniversary Paper: Evolution of ultrasound physics and the role of medical physicists and the AAPM and its journal in that evolution. Med. Phys . 2009 Jan;36(2)411-428.

Catalano M, Lamberti-Castronuovo A, Catalano A, Filocamo D, Zimbalatti C. Two-dimensional speckle-tracking strain imaging in the assessment of mechanical properties of carotid arteries: feasibility and comparison with conventional markers of subclinical atherosclerosis. Eur J Echocardiogr. 2011 Jul;12(7):528-35. doi: 10.1093/ejechocard/jer078. Epub 2011 Jun 17.

Cavalcante JL, Lima JA, Redheuil A, Al-Mallah MH. Aortic stiffness: current understanding and future directions. J Am Coll Cardiol. 2011 Apr 5;57(14):1511-22. doi: 10.1016/j.jacc.2010.12.017.

Celermajer DS, Sorensen KE, Gooch VM, Spiegelhalter DJ, Miller OI, Sullivan ID, Lloyd JK, Deanfield JE. Non-invasive detection of endothelial dysfunction in children and adults at risk of atherosclerosis. Lancet. 1992 Nov 7;340(8828):1111-5.

Celermajer DS, Sorensen KE, Georgakopoulos D, Bull C, Thomas O, Robinson J, Deanfield JE. Cigarette smoking is associated with dose-related and potentially reversible impairment of endothelium-dependent dilation in healthy young adults. Circulation. 1993 Nov;88(5 Pt 1):2149-55.

Celermajer DS, Sorensen KE, Bull C, Robinson J, Deanfield JE. Endotheliumdependent dilation in the systemic arteries of asymptomatic subjects relates to coronary risk factors and their interaction. J Am Coll Cardiol. 1994 Nov 15;24(6):1468-74.

Celermajer DS, Sorensen KE, Spiegelhalter DJ, Georgakopoulos D, Robinson J, Deanfield JE. Aging is associated with endothelial dysfunction in healthy men years before the age-related decline in women. J Am Coll Cardiol. 1994 Aug;24(2):471-6.

Chambless LE, Heiss G, Folsom AR, Rosamond W, Szklo M, Sharrett AR, Clegg LX. Association of coronary heart disease incidence with carotid arterial wall thickness and major risk factors: the Atherosclerosis Risk in Communities (ARIC) Study, 1987-1993. Am J Epidemiol. 1997 Sep 15;146(6):483-94. Chikwe J, Adams DH, Su KN, Anyanwu AC, Lin HM, Goldstone AB, Lang RM, Fischer GW. Can three-dimensional echocardiography accurately predict complexity of mitral valve repair? Eur J Cardiothorac Surg. 2012 Mar;41(3):518-24. doi: 10.1093/ejcts/ezr040. Epub 2012 Jan 4.

Chung AW, Yang HH, Kim JM, Sigrist MK, Chum E, Gourlay WA, Levin A.

Upregulation of matrix metalloproteinase-2 in the arterial vasculature contributes to stiffening and vasomotor dysfunction in patients with chronic kidney disease. Circulation. 2009 Sep 1;120(9):792-801. doi: 10.1161/CIRCULATIONAHA.109.862565. Epub 2009 Aug 17.

Ciftci FC, Caliskan M, Ciftci O, Gullu H, Uckuyu A, Toprak E, Yanik F. Impaired coronary microvascular function and increased intima-media thickness in preeclampsia. J Am Soc Hypertens. 2014 Nov;8(11):820-6. doi: 10.1016/j.jash.2014.08.012. Epub 2014 Aug 21.

Coll B, Feinstein SB. Carotid intima-media thickness measurements: techniques and clinical relevance. Curr Atheroscler Rep. 2008 Oct;10(5):444-50.

Coll B, Nambi V, Feinstein SB. New advances in noninvasive imaging of the carotid artery: CIMT, contrast-enhanced ultrasound, and vasa vasorum. Curr Cardiol Rep. 2010 Nov;12(6):497-502.

Cooke JP, Rossitch E Jr, Andon NA, Loscalzo J, Dzau VJ. Flow activates an endothelial potassium channel to release an endogenous nitrovasodilator. J Clin Invest. 1991 Nov;88(5):1663-71.

Corman B, Duriez M, Poitevin P, Heudes D, Bruneval P, Tedgui A, Levy BI. Aminoguanidine prevents age-related arterial stiffening and cardiac hypertrophy. Proc Natl Acad Sci U S A. 1998 Feb 3;95(3):1301-6.

Corsi C, Lang RM, Veronesi F, Caiani EG, Mac Enaeney P, Lamberti C, Mor-Avi V. Volumetric quantification of global and regional left ventricular function from real-time three-dimensional echocardiographic images. Circulation. 2005 Aug;112(8):1161-70. Corretti MC, Anderson TJ, Benjamin EJ, Celermajer D, Charbonneau F, Creager MA, Deanfield J, Drexler H, Gerhard-Herman M, Herrington D, Vallance P, Vita J, Vogel R; International Brachial Artery Reactivity Task Force. Guidelines for the ultrasound assessment of endothelial-dependent flow-mediated vasodilation of the brachial artery: a report of the International Brachial Artery Reactivity Task Force. J Am Coll Cardiol. 2002 Jan 16;39(2):257-65.

Cosgrove D, Piscaglia F, Bamber J, Bojunga J, Correas JM, Gilja OH, Klauser AS, Sporea I, Calliada F, Cantisani V, D'Onofrio M, Drakonaki EE, Fink M, Friedrich-Rust M, Fromageau J, Havre RF, Jenssen C, Ohlinger R, Săftoiu A, Schaefer F, Dietrich CF; EFSUMB. EFSUMB guidelines and recommendations on the clinical use of ultrasound elastography. Part 2: Clinical applications. Ultraschall Med. 2013 Jun;34(3):238-53. doi: 10.1055/s-0033-1335375. Epub 2013 Apr 19.

Davis PH, Dawson JD, Riley WA, Lauer RM. Carotid intimal-medial thickness is related to cardiovascular risk factors measured from childhood through middle age: The Muscatine Study. Circulation. 2001 Dec 4;104(23):2815-9.

Dawson JD, Sonka M, Blecha MB, Lin W, Davis PH. Risk factors associated with aortic and carotid intima-media thickness in adolescents and young adults: the Muscatine Offspring Study. J Am Coll Cardiol. 2009 Jun 16;53(24):2273-9. doi: 10.1016/j.jacc.2009.03.026.

Deanfield J, Donald A, Ferri C, Giannattasio C, Halcox J, Halligan S, Lerman A, Mancia G, Oliver JJ, Pessina AC, Rizzoni D, Rossi GP, Salvetti A, Schiffrin EL, Taddei S, Webb DJ; Working Group on Endothelin and Endothelial Factors of the European Society of Hypertension. Endothelial function and dysfunction. Part I: Methodological issues for assessment in the different vascular beds: a statement by the Working Group on Endothelin and Endothelial Factors of the European Society of Hypertension. J Hypertens. 2005 Jan;23(1):7-17.

Deckers R, Moonen CT. Ultrasound triggered, image guided, local drug delivery. J Control Release. 2010 Nov;148(1):25-33.

Derchi LE, Claudon M. Ultrasound: a strategic issue for radiology? Eur Radiol. 2009 Jan;19(1):1-6.

Dogan S, Plantinga Y, Evans GW, Meijer R, Grobbee DE, Bots ML; OPAL investigators. Ultrasound protocols to measure carotid intima-media thickness: a post-hoc analysis of the OPAL study. Curr Med Res Opin. 2009 Jan;25(1):109-22.

Dogan S, Duivenvoorden R, Grobbee DE, Kastelein JJ, Shear CL, Evans GW, Visseren FL, Bots ML; Radiance 1 and Radiance 2 Study Groups. Ultrasound protocols to measure carotid intima-media thickness in trials; comparison of reproducibility, rate of progression, and effect of intervention in subjects with familial hypercholesterolemia and subjects with mixed dyslipidemia. Ann Med. 2010 Sep;42(6):447-64.

Downey DB, Fenster A, Williams JC. Clinical Utility of Three-Dimensional Ultrasound. RadioGraphics. 2000 Mar;20(2):559-571.

Duley L. The global impact of pre-eclampsia and eclampsia. Semin Perinatol. 2009 Jun;33(3):130-7. doi: 10.1053/j.semperi.2009.02.010.

Dzau VJ. Tissue angiotensin and pathobiology of vascular disease, a unifying hypothesis. Hypertension 2001; 37: 1047-1052.

Espeland MA1, Hoen H, Byington R, Howard G, Riley WA, Furberg CD. Spatial distribution of carotid intimal-medial thickness as measured by B-mode ultrasonography. Stroke. 1994 Sep;25(9):1812-9.

Etsuda H, Takase B, Uehata A, Kusano H, Hamabe A, Kuhara R, Akima T, Matsushima Y, Arakawa K, Satomura K, Kurita A, Ohsuzu F. Morning attenuation of endothelium-dependent, flow-mediated dilation in healthy young men: possible connection to morning peak of cardiac events? Clin Cardiol. 1999 Jun;22(6):417-21.

Evans CS, Gooch L, Flotta D, Lykins D, Powers RW, Landsittel D, Roberts JM, Shroff SG. Cardiovascular system during the postpartum state in women with a history of preeclampsia. Hypertension. 2011 Jul;58(1):57-62. doi: 10.1161/HYPERTENSIONAHA.111.173278. Epub 2011 May 23. Fan XJ, Xu MJ, Zhang Y, Zhang M. The Application of Ultrasonic Velocity Vector Imaging Technique of Carotid Plaque in Predicting Large-Artery Atherosclerotic Stroke. J Stroke Cerebrovasc Dis. 2015 Mar 18. pii: S1052-3057(15)00082-8. doi: 10.1016/j.jstrokecerebrovasdis.2015.02.011.

Fenster A, Downey DB. 3D ultrasound imaging: a review. Eng. Med. Biol. 1996 Dec;15(6)41-51.

Fenster A, Downey D, Neale Cardinal H. Three-Dimensional Ultrasound Imaging. Phys Med Biol 2001 May: 46 (5)67-99.

Fenster A, Bax J, Neshat H, Kakani N, Romagnoli C (2013). 3D Ultrasound Imaging in Image-Guided Intervention, Advancements and Breakthroughs in Ultrasound Imaging, Dr. G P P Gunarathne (Ed.), ISBN: 978-953-51-1159-7, InTech, DOI: 10.5772/55230.

Finger PT, Khobehi A, Ponce-Contreras MR, Della Rocca D, Garcia JPS. Three dimensional ultrasound of retinoblastoma: initial experience. Br J Opthalmol. 2002 Oct;86(10):1136-1138.

Fischetti AJ, Scott RC. Basic Ultrasound Beam Formation and Instrumentation. Clin Tech Small Anim Pract. 2007 Aug;22(3):90-92.

Franklin SS, Gustin IVW, Wong ND, Larson MG, Weber MA, Kannel WB, Levy D. Hemodynamic patterns of age-related changes in blood pressure: The Framingham Heart Study. Circulation1997; 96:308–15.

Fuster V, Badimon L, Badimon JJ, Chesebro JH. The pathogenesis of coronary artery disease and the acute coronary syndromes, N Engl J Med. 1992 Jan 30;326(5):310-8.

Ghosh S, Mukhopadhyay S, Dutta SK, Chattopadhyay D, Biswas K. Diagnostic accuracy in retinoblastoma. J Indian Med Assoc. 2010 Aug;108(8):509-513.

Giannarelli C, De Negri F, Virdis A, Ghiadoni L, Cipriano A, Magagna A, Taddei S, Salvetti A. Nitric oxide modulates tissue plasminogen activator release in normotensive subjects and hypertensive patients. Hypertension. 2007 Apr;49(4):878-84. Epub 2007 Mar 5.

Giannattasio C, Piperno A, Failla M, Vergani A, Mancia G. Effects of

hematocrit changes on flow-mediated and metabolic vasodilation in humans. Hypertension. 2002 Jul;40(1):74-7.

Glagov S, Zarins C, Giddens DP, Ku DN. Hemodynamics and atherosclerosis. Insights and perspectives gained from studies of human arteries. Arch Pathol Lab Med. 1988 Oct;112(10):1018-31.

Gnasso A, Carallo C, Irace C, Spagnuolo V, De Novara G, Mattioli PL, Pujia A. Association between intima-media thickness and wall shear stress in common carotid arteries in healthy male subjects. Circulation. 1996 Dec 15;94(12):3257-62.

Gonzalez J, Wood JC, Dorey FJ, Wren TA, Gilsanz V. Reproducibility of carotid intima-media thickness measurements in young adults. Radiology. 2008 May;247(2):465-71. doi: 10.1148/radiol.2472070691. Epub 2008 Mar 18.

Gottdiener JS, Kop WJ, Hausner E, McCeney MK, Herrington D, Krantz DS. Effects of mental stress on flow-mediated brachial arterial dilation and influence of behavioral factors and hypercholesterolemia in subjects without cardiovascular disease. Am J Cardiol. 2003 Sep 15;92(6):687-91.

Hamper UM, DeJong MR, Caskey CI, Sheth S. Power Doppler Imaging: Clinical Experience and Correlation with Colour Doppler US and Other Imaging Modalities. Radiographics. 1997 Mar;17(2):500-513.

Hansen HH, Lopata RG, de Korte CL. Noninvasive carotid strain imaging using angular compounding at large beam steered angles: validation in vessel phantoms. IEEE Trans Med Imaging. 2009 Jun;28(6):872-80. doi: 10.1109/TMI.2008.2011510. Epub 2009 Jan 6.

Hardie KL, Kinlay S, Hardy DB, Wlodarczyk J, Silberberg JS, Fletcher PJ. Reproducibility of brachial ultrasonography and flow-mediated dilatation (FMD) for assessing endothelial function. Aust N Z J Med. 1997 Dec;27(6):649-52.

Hashimoto M, Akishita M, Eto M, Ishikawa M, Kozaki K, Toba K, Sagara Y, Taketani Y, Orimo H, Ouchi Y. Modulation of endothelium-dependent flowmediated dilatation of the brachial artery by sex and menstrual cycle. Circulation. 1995 Dec 15;92(12):3431-5. Harvey CJ, Pilcher JM, Eckersley RJ, Blomley MJ, Cosgrove DO. Advances in Ultrasound. Clin Radiol. 2002 Mar;57(3):157-77.

Hausvater A1, Giannone T, Sandoval YH, Doonan RJ, Antonopoulos CN, Matsoukis IL, Petridou ET, Daskalopoulou SS. The association between preeclampsia and arterial stiffness. J Hypertens. 2012 Jan;30(1):17-33. doi: 10.1097/HJH.0b013e32834e4b0f.

Helfand M, Buckley DI, Freeman M, Fu R, Rogers K, Fleming C, Humphrey LL. Emerging risk factors for coronary heart disease: a summary of systematic reviews conducted for the U.S. Preventive Services Task Force. Ann Intern Med. 2009 Oct 6;151(7):496-507.

Heliopoulos J, Vadikolias K, Piperidou C, Mitsias P. Detection of carotid artery plaque ulceration using 3-dimensional ultrasound. J Neuroimaging. 2011 Apr;21(2):126-31.

Herrmann J, Lerman A. The endothelium - the cardiovascular health barometer. Herz. 2008 Jul;33(5):343-53. Epub 2008 Sep 5.

Hoskins PR, Kenwright DA. Recent developments in vascular ultrasound technology. Ultrasound. 2015 Aug;23(3):158-65. doi: 10.1177/1742271X15578778. Epub 2015 Mar 26.

Hoppenrath M. 3D ultrasound technology...What does it add? Appl Radiol. 2006 Mar:35(2):24-35.

Huda JW. Review of Radiologic Physics. 2009 3rd edition. Chapter 10. 163-173.

Hwang IC, Kim KH, Choi WS, Kim HJ, Im MS, Kim YJ, Kim SH, Kim MA, Sohn DW, Zo JH. Impact of acute exercise on brachial artery flow-mediated dilatation in young healthy people. Cardiovasc Ultrasound. 2012 Oct 2;10:39. doi: 10.1186/1476-7120-10-39.

Irgens HU, Reisaeter L, Irgens LM, Lie RT. Long term mortality of mothers and fathers after pre-eclampsia: population based cohort study. BMJ. 2001 Nov 24;323(7323):1213-7.

Joannides R, Haefeli WE, Linder L, Richard V, Bakkali EH, Thuillez C, Lüscher TF. Nitric oxide is responsible for flow-dependent dilatation of human peripheral conduit arteries in vivo. Circulation. 1995 Mar 1;91(5):1314-9.

Jondeau G, Boutouyrie P, Lacolley P, Laloux B, Dubourg O, Bourdarias JP, Laurent S. Central pulse pressure is a major determinant of ascending aorta dilation in Marfan syndrome. Circulation. 1999 May 25;99(20):2677-81.

Karamanoglu M, O'Rourke MF, Avolio AP, Kelly RP. An analysis of the relationship between central aortic and peripheral upper limb pressure waves in man. Eur Heart J. 1993 Feb;14(2):160-7.

Karatolios K, Wittek A, Nwe TH, Bihari P, Shelke A, Josef D, Schmitz-Rixen T, Geks J, Maisch B, Blase C, Moosdorf R, Vogt S. Method for aortic wall strain measurement with three-dimensional ultrasound speckle tracking and fitted finite element analysis. Ann Thorac Surg. 2013 Nov;96(5):1664-71. doi: 10.1016/j.athoracsur.2013.06.037. Epub 2013 Aug 30.

Kass DA, Shapiro EP, Kawaguchi M, Capriotti AR, Scuteri A, deGroof RC, Lakatta EG. Improved arterial compliance by a novel advanced glycation endproduct crosslink breaker. Circulation. 2001 Sep 25;104(13):1464-70.

Kelly R, Hayward C, Avolio A, O'Rourke M. Noninvasive determination of agerelated changes in the human arterial pulse. Circulation. 1989 Dec;80(6):1652-9.

Kelm M, Preik M, Hafner DJ, Strauer BE. Evidence for a multifactorial process involved in the impaired flow response to nitric oxide in hypertensive patients with endothelial dysfunction. Hypertension. 1996 Mar;27(3 Pt 1):346-53.

Keogh JB, Grieger JA, Noakes M, Clifton PM. Flow-mediated dilatation is impaired by a high-saturated fat diet but not by a high-carbohydrate diet. Arterioscler Thromb Vasc Biol. 2005 Jun;25(6):1274-9. Epub 2005 Mar 17.

Kern R, Szabo K, Hennerici M, Meairs S. Characterization of Carotid Artery Plaques Using Real-time Compound B-mode Ultrasound. Stroke. 2004 Mar; 35(4);870-875. Kiechl S, Willeit . The natural course of atherosclerosis. Part1: Incidence and progression. Arterioscler Thromb Vasc Biol. 1999 Jun;19(6):1484-90.

Kim SA, Lee KH, Won HY, Park S, Chung JH, Jang Y, Ha JW. Quantitative assessment of aortic elasticity with aging using velocity-vector imaging and its histologic correlation. Arterioscler Thromb Vasc Biol. 2013 Jun;33(6):1306-12. doi: 10.1161/ATVBAHA.113.301312. Epub 2013 Apr 11.

Kinlay S, Creager MA, Fukumoto M, Hikita H, Fang JC, Selwyn AP, Ganz P. Endothelium-derived nitric oxide regulates arterial elasticity in human arteries in vivo. Hypertension. 2001 Nov;38(5):1049-53.

Kizhakekuttu TJ, Gutterman DD, Phillips SA, Jurva JW, Arthur EI, Das E, Widlansky ME. Measuring FMD in the Brachial Artery: How important is QRSgating? J Appl Physiol. 2010 Jul 29.

Koelwyn GJ, Currie KD, MacDonald MJ, Eves ND(2012). Ultrasonography and Tonometry for the Assessment of Human Arterial Stiffness, Applied Aspects of Ultrasonography in Humans, Prof. Philip Ainslie (Ed.), ISBN: 978-953-51-0522-0, InTech, DOI: 10.5772/39193.

Kolpakov V, Gordon D, Kulik TJ. Nitric oxide-generating compounds inhibit total protein and collagen synthesis in cultured vascular smooth muscle cells. Circ Res. 1995 Feb;76(2):305-9.

Kotsianos-Hermle D, Hiltawsky KM, Wirth S, Fischer T, Freise K, Reiser M. Analysis of 107 breast lesions with automated 3D ultrasound and comparison with mammography and manual ultrasound. Eur J Radiol. 2009 Jul;71(1):109-115.

Kosoff G. Basic Physics and Imaging Characteristics of Ultrasound. World J. Surg. 2000 Feb;24(2):134-142.

Kupesic s, Kurjak A. Predictors of IVF outcome by three-dimensional ultrasound. Hum Reprod. 2002 Apr;17(4):950-955.

Lacolley P, Boutouyrie P, Glukhova M, Daniel Lamaziere JM, Plouin PF, Bruneval P, Vuong P, Corvol P, Laurent S. Disruption of the elastin gene in adult Williams syndrome is accompanied by a paradoxical reduction in arterial stiffness. Clin Sci (Lond). 2002 Jul;103(1):21-9.

Lajemi M, Labat C, Gautier S, Lacolley P, Safar M, Asmar R, Cambien F, Benetos A. Angiotensin II type 1 receptor-153A/G and 1166A/C gene polymorphisms and increase in aortic stiffness with age in hypertensive subjects. J Hypertens. 2001 Mar;19(3):407-13.

Lantelme P, Mestre C, Lievre M, Gressard A, Milon H. Heart rate: an important confounder of pulse wave velocity assessment. Hypertension. 2002 Jun;39(6):1083-7.

Larsson M, Heyde B, Kremer F, Brodin LÅ, D'hooge J. Ultrasound speckle tracking for radial, longitudinal and circumferential strain estimation of the carotid artery--an in vitro validation via sonomicrometry using clinical and high-frequency ultrasound. Ultrasonics. 2015 Feb;56:399-408. doi: 10.1016/j.ultras.2014.09.005. Epub 2014 Sep 18.

Laurent S, Boutouyrie P. Recent advances in arterial stiffness and wave reflection in human hypertension. Hypertension. 2007 Jun;49(6):1202-6. Epub 2007 Apr 23.

Laurent S, Cockcroft J, Van Bortel L, Boutouyrie P, Giannattasio C, Hayoz D, Pannier B, Vlachopoulos C, Wilkinson I, Struijker-Boudier H; European Network for Non-invasive Investigation of Large Arteries. Expert consensus document on arterial stiffness: methodological issues and clinical applications. Eur Heart J. 2006 Nov;27(21):2588-605. Epub 2006 Sep 25.

Laurent S, Boutouyrie P, Asmar R, Gautier I, Laloux B, Guize L, Ducimetiere P, Benetos A. Aortic stiffness is an independent predictor of all-cause and cardiovascular mortality in hypertensive patients. Hypertension. 2001 May;37(5):1236-41.

Laurent S, Hayoz D, Trazzi S, Boutouyrie P, Waeber B, Omboni S, Brunner HR, Mancia G, Safar M. Isobaric compliance of the radial artery is increased in patients with essential hypertension. J Hypertens. 1993 Jan;11(1):89-98.

Lawrence JP. Physics and instrumentation of ultrasound. Crit Care Med. 2007 Aug;35(8):314-22.

Leeson CP, Whincup PH, Cook DG, Donald AE, Papacosta O, Lucas A, Deanfield JE. Flow-mediated dilation in 9- to 11-year-old children: the influence of intrauterine and childhood factors. Circulation. 1997 Oct 7;96(7):2233-8.

Levy D, Brink S. A CHANGE OF HEART. U.S. News & World Report [serial on the Internet]. (2005, Feb 14), [cited April 4, 2015]; 138(5): 54-57.

Li RX, Luo J, Balaram SK, Chaudhry FA, Shahmirzadi D, Konofagou EE. Pulse wave imaging in normal, hypertensive and aneurysmal human aortas in vivo: a feasibility study. Phys Med Biol. 2013 Jul 7;58(13):4549-62. doi: 10.1088/0031-9155/58/13/4549. Epub 2013 Jun 14.

Lieu D. Ultrasound Physics and Instrumentation for Pathologists. Arch Pathol Lab Med. 2010 Oct;134(10):1541-1556. Review.

Liu CS, Li CI, Shih CM, Lin WY, Lin CH, Lai SW, Li TC, Lin CC. Arterial stiffness measured as pulse wave velocity is highly correlated with coronary atherosclerosis in asymptomatic patients. J Atheroscler Thromb. 2011;18(8):652-8. Epub 2011 Apr 6.

Lorenz MW, Markus HS, Bots ML, Rosvall M, Sitzer M. Prediction of clinical cardiovascular events with carotid intima-media thickness: a systematic review and meta-analysis. Circulation. 2007 Jan 30;115(4):459-67. Epub 2007 Jan 22.

Ludmer PL, Selwyn AP, Shook TL, Wayne RR, Mudge GH, Alexander RW, Ganz P. Paradoxical vasoconstriction induced by acetylcholine in atherosclerotic coronary arteries. N Engl J Med. 1986 Oct 23;315(17):1046-51.

Lusis AJ, Atherosclerosis. Nature. 2000 Sep;407(2);233-241.

Ma XJ, Duan YY, Yuan LJ, Cao TS, Wang Y, Yang HG, Chen S. Quantitative assessment of maternal common carotid artery mechanics using velocity vector imaging in pre-eclampsia. Eur J Obstet Gynecol Reprod Biol. 2012 Jan;160(1):30-4. doi: 10.1016/j.ejogrb.2011.09.038. Epub 2011 Oct 22.

Mahmud A, Feely J. Effect of smoking on arterial stiffness and pulse pressure amplification. Hypertension. 2003 Jan;41(1):183-7.

Malek AM, Alper SL, Izumo S. Haemodynamic shear stress and its role in atherosclerosis. JAMA. 1999 Dec; 282(21):2035-2042.

Mancia G, De Backer G, Dominiczak A, et al. 2007 Guidelines for the management of arterial hypertension: The Task Force for the Management of Arterial Hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). Eur Heart J. 2007 Jun;28(12):1462-536. Epub 2007 Jun 11.

Mancia G, De Backer G, Dominiczak A, Cifkova R, Fagard R, Germano G, Grassi G, Heagerty AM, Kjeldsen SE, Laurent S, Narkiewicz K, Ruilope L, Rynkiewicz A, Schmieder RE, Boudier HA, Zanchetti A, Vahanian A, Camm J, De Caterina R, Dean V, Dickstein K, Filippatos G, Funck-Brentano C, Hellemans I, Kristensen SD, McGregor K, Sechtem U, Silber S, Tendera M, Widimsky P, Zamorano JL, Erdine S, Kiowski W, Agabiti-Rosei E, Ambrosioni E, Lindholm LH, Viigimaa M, Adamopoulos S, Agabiti-Rosei E, Ambrosioni E, Bertomeu V, Clement D, Erdine S, Farsang C, Gaita D, Lip G, Mallion JM, Manolis AJ, Nilsson PM, O'Brien E, Ponikowski P, Redon J, Ruschitzka F, Tamargo J, van Zwieten P, Waeber B, Williams B; Management of Arterial Hypertension of the European Society of Hypertension; European Society of Cardiology. 2007 Guidelines for the Management of Arterial Hypertension: The Task Force for the Management of Arterial Hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). J Hypertens. 2007 Jun;25(6):1105-87.

Mancini GB, Abbott D, Kamimura C, Yeoh E. Validation of a new ultrasound method for the measurement of carotid artery intima medial thickness and plaque dimensions. Can J Cardiol. 2004 Nov;20(13):1355-9.

Manning BJ, Kristmundsson T, Sonesson B, Resch T. Abdominal aortic aneurysm diameter: a comparison of ultrasound measurements with those from standard and three-dimensional computed tomography reconstruction. J Vasc Surg. 2009 Aug;50(2):263-8. doi: 10.1016/j.jvs.2009.02.243.

Manning TS, Shykoff BE, Izzo JL Jr. Validity and reliability of diastolic pulse contour analysis (windkessel model) in humans. Hypertension. 2002 May;39(5):963-8.

Mannion TC, Vita JA, Keaney JF Jr, Benjamin EJ, Hunter L, Polak JF. Noninvasive assessment of brachial artery endothelial vasomotor function: the effect of cuff position on level of discomfort and vasomotor responses. Vasc Med. 1998;3(4):263-7.

Maple-Brown LJ, Piers LS, O'Rourke MF, Celermajer DS, O'Dea K. Increased arterial stiffness in remote Indigenous Australians with high risk of cardiovascular disease. J Hypertens. 2007 Mar;25(3):585-91.

Masawa N, Glagov S, Zarins CK. Quantitative morphologic study of intimal thickening at the human carotid bifurcation: I. Axial and circumferential distribution of maximum intimal thickening in asymptomatic, uncomplicated plaques. Atherosclerosis. 1994 Jun;107(2):137-46.

Medley TL, Cole TJ, Gatzka CD, Wang WY, Dart AM, Kingwell BA. Fibrillin-1 genotype is associated with aortic stiffness and disease severity in patients with coronary artery disease. Circulation. 2002 Feb 19;105(7):810-5.

Meinders JM, Kornet L, Hoeks AP. Assessment of spatial inhomogeneities in intima media thickness along an arterial segment using its dynamic behavior. Am J Physiol Heart Circ Physiol. 2003 Jul;285(1):H384-91. Epub 2003 Mar 13.

Messas E, Pernot M, Couade M. Arterial wall elasticity: state of the art and future prospects. Diagn Interv Imaging. 2013 May;94(5):561-9. doi: 10.1016/j.diii.2013.01.025. Epub 2013 Apr 22.

Millasseau SC, Patel SJ, Redwood SR, Ritter JM, Chowienczyk PJ. Pressure wave reflection assessed from the peripheral pulse: is a transfer function necessary? Hypertension. 2003 May;41(5):1016-20. Epub 2003 Apr 14.

Mirault T, Pernot M, Frank M, Couade M, Niarra R, Azizi M, Emmerich J, Jeunemaître X, Fink M, Tanter M, Messas E. Carotid stiffness change over the cardiac cycle by ultrafast ultrasound imaging in healthy volunteers and

vascular Ehlers-Danlos syndrome. J Hypertens. 2015 Sep;33(9):1890-6; discussion 1896. doi: 10.1097/HJH.0000000000000617.

Moens AL, Goovaerts I, Claeys MJ, Vrints CJ. Flow-mediated vasodilation: a diagnostic instrument, or an experimental tool? Chest. 2005 Jun;127(6):2254-63.

Mor-Avi V, Sugeng L, Lang RM. Three-dimensional adult echocardiography: where the hidden dimension helps. Current Cardiol Rep. 2008 May;10(3):218-225.

Nambi V, Chambless L, Folsom AR, He M, Hu Y, Mosley T, Volcik K, Boerwinkle E, Ballantyne CM. Carotid intima-media thickness and presence or absence of plaque improves prediction of coronary heart disease risk: the ARIC (Atherosclerosis Risk In Communities) study. J Am Coll Cardiol. 2010 Apr 13;55(15):1600-7.

Nelson TR, Pretorius DH, Hull A, Riccabona M, Sklansky MS, James G. Sources and impact of artifacts on clinical three-dimensional ultrasound imaging. Ultrasound Obstet Gynecol. 2000 Sep;16(4):374-383.

Neunteufl T, Katzenschlager R, Hassan A, Klaar U, Schwarzacher S, Glogar D, Bauer P, Weidinger F. Systemic endothelial dysfunction is related to the extent and severity of coronary artery disease. Atherosclerosis. 1997 Feb 28;129(1):111-8.

O'Brien et al 1996. O'Brien E, Mee F, Atkins N, Thomas M. Evaluation of three devices for self measurement of blood pressure according to the revised British Hypertension Society Protocol:the Omron HEM-705CP, Philips HP5332, and Nissei DS-175. Blood Press Monit.1996;1:55-61.

Oishi Y, Mizuguchi Y, Miyoshi H, Iuchi A, Nagase N, Oki T. A novel approach to assess aortic stiffness related to changes in aging using a two-dimensional strain imaging. Echocardiography. 2008 Oct;25(9):941-5. doi: 10.1111/j.1540-8175.2008.00725.x. Okahara K, Sun B, Kambayashi J. Upregulation of prostacyclin synthesisrelated gene expression by shear stress in vascular endothelial cells. Arterioscler Thromb Vasc Biol. 1998 Dec;18(12):1922-6.

O'Leary DH, Polak JF, Kronmal RA, Kittner SJ, Bond MG, Wolfson SK Jr, Bommer W, Price TR, Gardin JM, Savage PJ. Distribution and correlates of sonographically detected carotid artery disease in the Cardiovascular Health Study. The CHS Collaborative Research Group. Stroke. 1992 Dec;23(12):1752-60.

O'Leary DH, Bots ML. Imaging of atherosclerosis: carotid intima-media thickness. Eur Heart J. 2010 Jul;31(14):1682-9. Epub 2010 Jun 11.

O'Rourke MF, Staessen JA, Vlachopoulos C, Duprez D, Plante GE. Clinical applications of arterial stiffness; definitions and reference values. Am J Hypertens. 2002 May;15(5):426-44.

O'Rourke MF, Safar ME. Relationship between aortic stiffening and microvascular disease in brain and kidney: cause and logic of therapy. Hypertension. 2005 Jul;46(1):200-4. Epub 2005 May 23.

Otto ME, Svatikova A, Barretto RB, Santos S, Hoffmann M, Khandheria B, Somers V. Early morning attenuation of endothelial function in healthy humans. Circulation. 2004 Jun 1;109(21):2507-10. Epub 2004 May 10.

Paniagua OA, Bryant MB, Panza JA. Role of endothelial nitric oxide in shear stress-induced vasodilatation of human microvasculature. Circulation. 2001 Dec;103:1752-58.

Panza JA, Quyyumi AA, Brush JE Jr, Epstein SE. Abnormal endotheliumdependent vascular relaxation in patients with essential hypertension. N Engl J Med. 1990 Jul 5;323(1):22-7.

Papamichael CM, Aznaouridis KA, Karatzis EN, Karatzi KN, Stamatelopoulos KS, Vamvakou G, Lekakis JP, Mavrikakis ME. Effect of coffee on endothelial function in healthy subjects: the role of caffeine. Clin Sci (Lond). 2005 Jul;109(1):55-60.

Park HE, Cho GY, Kim HK, Kim YJ, Sohn DW. Validation of circumferential

carotid artery strain as a screening tool for subclinical atherosclerosis. J Atheroscler Thromb. 2012;19(4):349-56. Epub 2011 Dec 21.

Patel S, Celermajer DS. Assessment of vascular disease using arterial flow mediated dilatation. Pharmacol Rep. 2006;58 Suppl:3-7.

Pauca AL, O'Rourke MF, Kon ND. Prospective evaluation of a method for estimating ascending aortic pressure from the radial artery pressure waveform. Hypertension. 2001 Oct;38(4):932-7.

Peretz A, Leotta DF, Sullivan JH, Trenga CA, Sands FN, Aulet MR, Paun M, Gill EA, Kaufman JD. Flow mediated dilation of the brachial artery: an investigation of methods requiring further standardization. BMC Cardiovasc Disord. 2007 Mar 21;7:11.

Pignoli P, Tremoli E, Poli A, Oreste P, Paoletti R. Intimal plus medial thickness of the arterial wall: a direct measurement with ultrasound imaging. Circulation. 1986 Dec;74(6):1399-406.

Podgórski M, Grzelak P, Szymczyk K, Szymczyk E, Drożdż J, Stefańczyk L. Peripheral vascular stiffness, assessed with two-dimensional speckle tracking versus the degree of coronary artery calcification, evaluated by tomographic coronary artery calcification index. Arch Med Sci. 2015 Mar 16;11(1):122-9. doi: 10.5114/aoms.2015.49205. Epub 2015 Mar 14.

Pohl U, Holtz J, Busse R, Bassenge E. Crucial role of endothelium in the vasodilator response to increased flow in vivo. Hypertension. 1986 Jan;8(1):37-44.

Polak JF, Person SD, Wei GS, Godreau A, Jacobs DR Jr, Harrington A, Sidney S, O'Leary DH. Segment-specific associations of carotid intima-media thickness with cardiovascular risk factors: the Coronary Artery Risk Development in Young Adults (CARDIA) study. Stroke. 2010 Jan;41(1):9-15. Epub 2009 Nov 12.

Polak JF, Johnson C, Harrington A, Wong Q, O'Leary DH, Burke G, Yanez ND. Changes in carotid intima-media thickness during the cardiac cycle: the multi-ethnic study of atherosclerosis.

J Am Heart Assoc. 2012 Aug;1(4):e001420. doi: 10.1161/JAHA.112.001420. Epub 2012 Aug 24.

Polak JF, Pencina MJ, Meisner A, Pencina KM, Brown LS, Wolf PA, D'Agostino RB Sr. Associations of carotid artery intima-media thickness (IMT) with risk factors and prevalent cardiovascular disease: comparison of mean common carotid artery IMT with maximum internal carotid artery IMT. J Ultrasound Med. 2010 Dec;29(12):1759-68.

Polak JF, Meisner A, Pencina MJ, Wolf PA, D'Agostino RB. Variations in common carotid artery intima-media thickness during the cardiac cycle: implications for cardiovascular risk assessment. J Am Soc Echocardiogr. 2012 Sep;25(9):1023-8. doi: 10.1016/j.echo.2012.05.007. Epub 2012 Jun 20.

Prince CT, Secrest AM, Mackey RH, Arena VC, Kingsley LA, Orchard TJ. Pulse wave analysis and prevalent cardiovascular disease in type 1 diabetes. Atherosclerosis. 2010 Dec;213(2):469-74. doi:

10.1016/j.atherosclerosis.2010.08.080. Epub 2010 Sep 15.

Rader DJ, Daugherty A. Translating molecular discoveries into new therapies for atherosclerosis. Nature. 2008 Feb;21;451(7181):904-13.

Raitakari OT, Adams MR, McCredie RJ, Griffiths KA, Celermajer DS. Arterial endothelial dysfunction related to passive smoking is potentially reversible in healthy young adults. Ann Intern Med. 1999 Apr 6;130(7):578-81.

Raitakari OT, Juonala M, Kähönen M, Taittonen L, Laitinen T, Mäki-Torkko N, Järvisalo MJ, Uhari M, Jokinen E, Rönnemaa T, Akerblom HK, Viikari JS. Cardiovascular risk factors in childhood and carotid artery intima-media thickness in adulthood: the Cardiovascular Risk in Young Finns Study. JAMA. 2003 Nov 5;290(17):2277-83.

Ramsay LE, Williams B, Johnston GD, MacGregor GA, Poston L, Potter JF, et al. British Hypertension Society guidelines for hypertension management 1999: summary. BMJ. 1999;319:630-5.

Ramnarine KV, Garrard JW, Kanber B, Nduwayo S, Hartshorne TC, Robinson TG. Shear wave elastography imaging of carotid plaques: feasible,

reproducible and of clinical potential. Cardiovascular Ultrasound. 2014;12:49. doi:10.1186/1476-7120-12-49.

Ray JG, Vermeulen MJ, Schull MJ, Redelmeier DA. Cardiovascular health after maternal placental syndromes (CHAMPS): population-based retrospective cohort study. Lancet. 2005 Nov 19;366(9499):1797-803.

Reza Chabok H, Cannata JM, Ham Kim H, Williams JA, Park J, Kirk Shung K. A high-frequency annular-array transducer using an interdigital bonded 1-3 composite. IEEE Trans Ultrason Ferroelectr Freq Control. 2011 Jan;58(1):206-14.

Rhee MY, Lee HY, Park JB. Measurements of Arterial Stiffness: Methodological Aspects. Korean Circ J. 2008 Jul;38(7):343-350.

Roman MJ, Naqvi TZ, Gardin JM, Gerhard-Herman M, Jaff M, Mohler E; American Society of Echocardiography; Society of Vascular Medicine and Biology. Clinical application of noninvasive vascular ultrasound in cardiovascular risk stratification: a report from the American Society of Echocardiography and the Society of Vascular Medicine and Biology. J Am Soc Echocardiogr. 2006 Aug;19(8):943-54.

Rose SC, Behling C, Roberts AC, Pretorius DH, Nelson TR, Kinney TB, Masliah E, Hassanein TI. Main portal vein access in transjugular intrahepatic portosystemic shunt procedures: use of three-dimensional ultrasound to ensure safety. J Vasc Interv Radiol. 2002 Mar;13(3):267-73.

Ross R. The pathogenesis of atherosclerosis: a perspective for the 1990s. Nature. 1993 Apr 29;362(6423):801-9.

Rubin JM. In Doppler Sonography, what is Aliasing and how does it help detect Vascular Stenosis. Am J Roentgenol. 1995 Oct;165(4):1003-1004.

Safar ME, Blacher J, Pannier B, Guerin AP, Marchais SJ, Guyonvarc'h PM, London GM. Central pulse pressure and mortality in end-stage renal disease. Hypertension. 2002 Mar 1;39(3):735-8.

Saito M, Okayama H, Inoue K, Yoshii T, Hiasa G, Sumimoto T, Nishimura K, Ogimoto A, Higaki J. Carotid arterial circumferential strain by two-dimensional

speckle tracking: a novel parameter of arterial elasticity. Hypertens Res. 2012 Sep;35(9):897-902. doi: 10.1038/hr.2012.39. Epub 2012 Apr 12.

Salim R, Woelfer B, Backos M, Regan L, Jurkovic D. Reproducibility of threedimensional ultrasound diagnosis of congenital uterine abnormalities. Ultrasound Obstet Gynecol. 2004 Jun;21(6):578-582.

Sanz J, Fayad ZA. Imaging of atherosclerotic cardiovascular disease. Nature. 2008 Feb 21;451(7181):953-7. Review

Savvidou MD, Kaihura C, Anderson JM, Nicolaides KH. Maternal arterial stiffness in women who subsequently develop pre-eclampsia. PLoS One. 2011 May 3;6(5):e18703. doi: 10.1371/journal.pone.0018703.

Schächinger V, Britten MB, Zeiher AM. Prognostic impact of coronary vasodilator dysfunction on adverse long-term outcome of coronary heart disease. Circulation. 2000 Apr 25;101(16):1899-906.

Sejda T, Pit'ha J, Svandová E, Poledne R. Limitations of non-invasive endothelial function assessment by brachial artery flow-mediated dilatation. Clin Physiol Funct Imaging. 2005 Jan;25(1):58-61.

Selzer RH, Mack WJ, Lee PL, Kwong-Fu H, Hodis HN. Improved common carotid elasticity and intima-media thickness measurements from computer analysis of sequential ultrasound frames. Atherosclerosis. 2001 Jan;154(1):185-93.

Shechter M, Issachar A, Marai I, Koren-Morag N, Freinark D, Shahar Y, Shechter A, Feinberg MS. Long-term association of brachial artery flowmediated vasodilation and cardiovascular events in middle-aged subjects with no apparent heart disease. Int J Cardiol. 2009 May 1;134(1):52-8. Epub 2008 May 13.

Smith A, Chudleigh T, Maxwell D. Incorporating 3D and 4D ultrasound into clinical practice. Ultrasound. 2005 Feb;13(1):4-11.

Sonka M, Hlavac V, Boyle R. Image Processing, Analysis, and Machine Vision. 2007. Thomson Engineering, Toronto, Canada, 3rd edition.

Sorensen GL, Jensen JB, Udesen J, Holfort IK, Jensen JA. Pulse wave velocity in the carotid artery. Proc IEEE Ultrason Symp. 2008:1386–1389.

Sorensen KE, Celermajer DS, Georgakopoulos D, Hatcher G, Betteridge DJ, Deanfield JE. Impairment of endothelium-dependent dilation is an early event in children with familial hypercholesterolemia and is related to the lipoprotein(a) level. J Clin Invest. 1994 Jan;93(1):50-5.

Sorensen KE, Celermajer DS, Spiegelhalter DJ, Georgakopoulos D, Robinson J, Thomas O, Deanfield JE. Non-invasive measurement of human endothelium dependent arterial responses: accuracy and reproducibility. Br Heart J. 1995 Sep;74(3):247-53.

Sprouse LR 2nd, Meier GH 3rd, Lesar CJ, Demasi RJ, Sood J, Parent FN, Marcinzyck MJ, Gayle RG. Comparison of abdominal aortic aneurysm diameter measurements obtained with ultrasound and computed tomography: Is there a difference? J Vasc Surg. 2003 Sep;38(3):466-71; discussion 471-2.

Stassen FR, Vainas T, Bruggeman CA. nfection and atherosclerosis. An alternative view on an outdated hypothesis. Pharmacol Rep. 2008 Jan-Feb;60(1):85-92.

Stein JH, Fraizer MC, Aeschlimann SE, Nelson-Worel J, McBride PE, Douglas PS. Vascular age: integrating carotid intima-media thickness measurements with global coronary risk assessment. Clin Cardiol. 2004 Jul;27(7):388-92.

Stein JH, Korcarz CE, Hurst RT, Lonn E, Kendall CB, Mohler ER, Najjar SS, Rembold CM, Post WS; American Society of Echocardiography Carotid Intima-Media Thickness Task Force. Use of carotid ultrasound to identify subclinical vascular disease and evaluate cardiovascular disease risk: a consensus statement from the American Society of Echocardiography Carotid Intima-Media Thickness Task Force. Endorsed by the Society for Vascular Medicine. J Am Soc Echocardiogr. 2008 Feb;21(2):93-111; quiz 189-90.

Stein JH, Johnson HM. Carotid intima-media thickness, plaques, and cardiovascular disease risk: implications for preventive cardiology guidelines. J Am Coll Cardiol. 2010 Apr 13;55(15):1608-10.

Stout M. Flow-mediated dilatation: a review of techniques and applications. Echocardiography. 2009 Aug;26(7):832-41.

Sun D, Huang A, Smith CJ, Stackpole CJ, Connetta JA, Shesely EG, Koller A, Kaley G. Enhanced release of prostaglandins contributes to flow-induced arteriolar dilation in eNOS knockout mice. Circ Res. 1999 Aug 6;85(3):288-93.

Suwaidi JA, Hamasaki S, Higano ST, Nishimura RA, Holmes DR Jr, Lerman A. Long-term follow-up of patients with mild coronary artery disease and endothelial dysfunction. Circulation. 2000 Mar 7;101(9):948-54.

Svedlund S, Gan LM. Longitudinal wall motion of the common carotid artery can be assessed by velocity vector imaging. Clin Physiol Funct Imaging. 2011 Jan;31(1):32-8. doi: 10.1111/j.1475-097X.2010.00976.x. Epub 2010 Sep 23.

Svedlund S, Eklund C, Robertsson P, Lomsky M, Gan LM. Carotid artery longitudinal displacement predicts 1-year cardiovascular outcome in patients with suspected coronary artery disease. Arterioscler Thromb Vasc Biol. 2011 Jul;31(7):1668-74. doi: 10.1161/ATVBAHA.111.222901. Epub 2011 Apr 28.

Tajik P, Meijer R, Duivenvoorden R, Peters SA, Kastelein JJ, Visseren FJ, Crouse JR 3rd, Palmer MK, Raichlen JS, Grobbee DE, Bots ML. Asymmetrical distribution of atherosclerosis in the carotid artery: identical patterns across age, race, and gender. Eur J Prev Cardiol. 2012 Aug;19(4):687-97. doi: 10.1177/1741826711410821. Epub 2011 May 25.

Taylor PM. Ultrasound for Anaesthetists, Practical Procedures. Curr Anaesth Crit Care. 2003 Oct;14(5)237-249.

Tedesco MA, Natale F, Di Salvo G, Caputo S, Capasso M, Calabró R. Effects of coexisting hypertension and type II diabetes mellitus on arterial stiffness. J Hum Hypertens. 2004 Jul;18(7):469-73.

Touboul PJ, Hennerici MG, Meairs S, Adams H, Amarenco P, Bornstein N, Csiba L, Desvarieux M, Ebrahim S, Fatar M, Hernandez Hernandez R, Jaff M, Kownator S, Prati P, Rundek T, Sitzer M, Schminke U, Tardif JC, Taylor A, Vicaut E, Woo KS, Zannad F, Zureik M. Mannheim carotid intima-media thickness consensus (2004-2006). An update on behalf of the Advisory Board of the 3rd and 4th Watching the Risk Symposium, 13th and 15th European Stroke Conferences, Mannheim, Germany, 2004, and Brussels, Belgium, 2006. Cerebrovasc Dis. 2007;23(1):75-80. Epub 2006 Nov 14.

Uehata A, Lieberman EH, Gerhard MD, Anderson TJ, Ganz P, Polak JF, Creager MA, Yeung AC. Noninvasive assessment of endothelium-dependent flow-mediated dilation of the brachial artery. Vasc Med. 1997;2(2):87-92.

Urbina EM, Srinivasan SR, Tang R, Bond MG, Kieltyka L, Berenson GS; Bogalusa Heart Study. Impact of multiple coronary risk factors on the intimamedia thickness of different segments of carotid artery in healthy young adults (The Bogalusa Heart Study). Am J Cardiol. 2002 Nov 1;90(9):953-8.

Urbina EM, Khoury PR, McCoy CE, Dolan LM, Daniels SR, Kimball TR. Triglyceride to HDL-C ratio and increased arterial stiffness in children, adolescents, and young adults. Pediatrics. 2013 Apr;131(4):e1082-90. doi: 10.1542/peds.2012-1726. Epub 2013 Mar 4.

Van Bortel LM, Duprez D, Starmans-Kool MJ, Safar ME, Giannattasio C, Cockcroft J, Kaiser DR, Thuillez C. Clinical applications of arterial stiffness, Task Force III: recommendations for user procedures. Am J Hypertens. 2002 May;15(5):445-52.

Van Bortel LM, Balkestein EJ, van der Heijden-Spek JJ, Vanmolkot FH, Staessen JA, Kragten JA, Vredeveld JW, Safar ME, Struijker Boudier HA, Hoeks AP. Non-invasive assessment of local arterial pulse pressure: comparison of applanation tonometry and echo-tracking. J Hypertens. 2001 Jun;19(6):1037-44.

van Dijk RA, Nijpels G, Twisk JW, Steyn M, Dekker JM, Heine RJ, Donker AJ, Stehouwer CD. Change in common carotid artery diameter, distensibility and compliance in subjects with a recent history of impaired glucose tolerance: a 3year follow-up study. J Hypertens. 2000 Mar;18(3):293-300.

Vappou J, Luo J, Okajima K, Di Tullio M, Konofagou E. Aortic pulse wave velocity measured by pulse wave imaging (PWI): A comparison with applanation tonometry. Artery Res. 2011 Jun 1;5(2):65-71.

Vappou J, Luo J, Konofagou EE. Pulse wave imaging for noninvasive and quantitative measurement of arterial stiffness in vivo. Am J Hypertens. 2010 Apr;23(4):393-8. doi: 10.1038/ajh.2009.272. Epub 2010 Jan 21.

Vogel RA, Corretti MC, Gellman J. Cholesterol, cholesterol lowering, and endothelial function. Prog Cardiovasc Dis. 1998 Sep-Oct;41(2):117-36.

Vogel RA, Corretti MC, Plotnick GD. A comparison of brachial artery flowmediated vasodilation using upper and lower arm arterial occlusion in subjects with and without coronary risk factors. Clin Cardiol. 2000 Aug;23(8):571-5.

Wald DS, Bestwick JP, Morton G, Drummond L, Jenkins N, Khodabakhsh P, Curzen NP. Combining carotid intima-media thickness with carotid plaque on screening for coronary heart disease. J Med Screen. 2009;16(3):155-9. doi: 10.1258/jms.2009.009039.

Wang JW, Zhou ZQ, Hu DY. Prevalence of arterial stiffness in North China, and associations with risk factors of cardiovascular disease: a communitybased study. BMC Cardiovasc Disord. 2012 Dec 7;12:119. doi: 10.1186/1471-2261-12-119.

Wang M, Lakatta EG. Altered regulation of matrix metalloproteinase-2 in aortic remodeling during aging. Hypertension. 2002 Apr;39(4):865-73.

Webb DJ, Vallance P. Endothelial function in hypertension. 1997. 1st edition.

Weber T, Auer J, O'rourke MF, Kvas E, Lassnig E, Lamm G, Stark N, Rammer M, Eber B. Increased arterial wave reflections predict severe cardiovascular events in patients undergoing percutaneous coronary interventions. Eur Heart J. 2005 Dec;26(24):2657-63. Epub 2005 Sep 23.

Weinstein SP, Conant EF, Sehgal C. Technical advances in breast ultrasound imaging. Semin Ultrasound CT MR. 2006 Aug;27(4):273-83.

Wendelhag et al 1997. Wendelhag I, Liang Q, Gustavsson T, Wikstrand J. A new automated computerized analyzing system simplifies readings and reduces the variability in ultrasound measurement of intima-media thickness. Stroke. 1997;28:2195-200.

Wessels T, Harrer JU, Stetter S, Mull M, Klotzsch C. Three-dimensional assessment of extracranial Doppler sonography in carotid artery stenosis compared with digital subtraction angiography. Stroke. 2004 Aug;35(8):1848-51.

Widlansky ME, Vita JA, Keyes MJ, Larson MG, Hamburg NM, Levy D, Mitchell GF, Osypiuk EW, Vasan RS, Benjamin EJ. Relation of season and temperature to endothelium-dependent flow-mediated vasodilation in subjects without clinical evidence of cardiovascular disease (from the Framingham Heart Study). Am J Cardiol. 2007 Aug 1;100(3):518-23. Epub 2007 Jun 18.

Wikstrand J. Methodological considerations of ultrasound measurement of carotid artery intima-media thickness and lumen diameter. Clin Physiol Funct Imaging. 2007 Nov;27(6):341-5.

Williams SB, Cusco JA, Roddy MA, Johnstone MT, Creager MA. Impaired nitric oxide-mediated vasodilation in patients with non-insulin-dependent diabetes mellitus. J Am Coll Cardiol. 1996 Mar 1;27(3):567-74.

Williams B, Lacy PS, Thom SM, Cruickshank K, Stanton A, Collier D, Hughes AD, Thurston H, O'Rourke M; CAFE Investigators; Anglo-Scandinavian Cardiac Outcomes Trial Investigators; CAFE Steering Committee and Writing Committee. Differential impact of blood pressure-lowering drugs on central aortic pressure and clinical outcomes: principal results of the Conduit Artery Function Evaluation (CAFE) study. Circulation. 2006 Mar 7;113(9):1213-25. Epub 2006 Feb 13.

Willum-Hansen T, Staessen JA, Torp-Pedersen C, Rasmussen S, Thijs L, Ibsen H, Jeppesen J. Prognostic value of aortic pulse wave velocity as index of arterial stiffness in the general population. Circulation. 2006 Feb 7;113(5):664-70.

Wilkinson IB, MacCallum H, Flint L, Cockcroft JR, Newby DE, Webb DJ. The influence of heart rate on augmentation index and central arterial pressure in humans. J Physiol2000; 525:263–70.

Yasmin, McEniery CM, O'Shaughnessy KM, Harnett P, Arshad A, Wallace S, Maki-Petaja K, McDonnell B, Ashby MJ, Brown J, Cockcroft JR, Wilkinson IB. Variation in the human matrix metalloproteinase-9 gene is associated with arterial stiffness in healthy individuals. Arterioscler Thromb Vasc Biol. 2006 Aug;26(8):1799-805. Epub 2006 May 18.

Zahnd G, Orkisz M, Sérusclat A, Moulin P, Vray D. Simultaneous extraction of carotid artery intima-media interfaces in ultrasound images: assessment of wall thickness temporal variation during the cardiac cycle. Int J Comput Assist Radiol Surg. 2013 Oct 12.

Zarins CK, Giddens DP, Bharadvaj BK, Sottiurai VS, Mabon RF, Glagov S. Carotid bifurcation atherosclerosis: quantitative correlation of plaque localization with flow velocity profiles and wall shear stress. Circ Res. 1983 Oct;53(4):502-14.

Zhao Y, Cachard C, Liebgott H. Automatic needle detection and tracking in 3D ultrasound using an ROI-based RANSAC and Kalman method. Ultrason Imaging. 2013 Oct;35(4):283-306. doi: 10.1177/0161734613502004.

Zhou YF. High intensity focused ultrasound in clinical tumor ablation. World J Clin Oncol. 2011 Jan; 2(1): 8–27.

Zieman SJ, Melenovsky V, Kass DA. Mechanisms, pathophysiology, and therapy of arterial stiffness. Arterioscler Thromb Vasc Biol. 2005 May;25(5):932-43. Epub 2005 Feb 24.