Nailfold Video-Capillaroscopy in the Study of Cardiovascular Disease: A Systematic Review

Running head: Nailfold Findings in Cardiovascular Disease

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Supplemental Digital Content

Table S1 | Reasons for exclusion

Reason 1: Cardiovascular disease not studied
1. Francischetti EA, Tibirica E, Da Silva EG, Rodrigues E, Celoria BM, De Abreu VG. Skin Capillary Density and Microvascular Reactivity in Obese Subjects with and without Metabolic Syndrome. *Microvasc Res* 2011; **81**:325-330. 2. Holm T, Aukrust P, Andreassen AK, Ueland T, Brosstad F, Frøland SS, et al. Peripheral endothelial dysfunction in heart transplant recipients: Possible role of proinflammatory cytokines. *Clin Transplant* 2000; **14**:218-225. 3. Obert P, Walther G, Dutheil F, Lesourd B, Chapier R, Courteix D, et al. Regional myocardial function abnormalities are associated with macro- and microcirculation dysfunction in the metabolic syndrome: the RESOLVE study. *Heart Vessels* 2018; **33**:688-694. 4. Strain WD, Chaturvedi N, Bulpitt CJ, Rajkumar C, Shore AC. Albumin excretion rate and cardiovascular risk: Could the association be explained by early microvascular dysfunction? *Diabetes* 2005; **54**:1816-1822. 5. Walther G, Obert P, Dutheil F, Chapier R, Lesourd B, Naughton G, et al. Metabolic syndrome individuals with and without type 2 diabetes mellitus present generalized vascular dysfunction: Cross-sectional study. *Arterioscler Thromb Vasc Biol* 2015; **35**:1022-1029.
Reason 2: Lack of a comparator group
1. Belcaro G, Ledda A, Hu S, Cesarone MR, Feragalli B, Dugall M. Grape seed procyanidins in pre- and mild hypertension: A registry study. *Evid Based Complement Alternat Med* 2013; **2013**. 2. van der Horst M, van Weissenbruch MM, de Vries JI. Thrombophilia mediates lowering cardiovascular risk factors in women with a history of preeclampsia. *Hypertens Pregnancy* 2011; **30**:421-432.

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Reason 3: Use of an invasive test

1. Craighead DH, Alexander LM. Menthol-induced cutaneous vasodilation is preserved in essential hypertensive men and women. *Am J Hypertens* 2017; **30**:1156-1162.
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3. Dillon GA, Greaney JL, Shank S, Leuenberger UA, Alexander LM. AHA/ACC-defined stage 1 hypertensive adults do not display cutaneous microvascular endothelial dysfunction. *American Journal of Physiology - Heart and Circulatory Physiology* 2020; **319** :H539-H546.
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5. Stanhewicz AE, Alexander LM. Local angiotensin-(1–7) administration improves microvascular endothelial function in women who have had preeclampsia. *American Journal of Physiology - Regulatory Integrative and Comparative Physiology* 2020; **318**:R148-R155.
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women with a history of preeclamptic pregnancy. *Pregnancy Hypertens* 2022; **27**:81-86.

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12. Turner CG, Miller JT, Otis JS, Hayat MJ, Quyyumi AA, Wong BJ. Cutaneous sensory nerve-mediated microvascular vasodilation in normotensive and prehypertensive non-Hispanic Blacks and Whites. *Physiological Reports* 2020; **8**.
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American Journal of Physiology - Heart and Circulatory Physiology 2020; **319**:H271-H281.

Reason 4: Written in foreign language

1. Karpova IE, Fedorovich AA, Soboleva GN, Samoylenko LE, Rogoza AN, Karpov YA. Laser dopplerographic flowmetry in assessment of functional condition of the skin microvessels in patients with microvascular angina. *Russian Journal of Cardiology* 2015; **119**:58-63.

Reason 5: Measurements not provided

1. Cseprekál O, Egresits J, Tabák Á, Nemcsik J, Járai Z, Babos L, et al. The significance of micro- and macrovascular biomarkers on cardiovascular outcome in chronic kidney disease: a prospective cohort study. *J Hum Hypertens* 2016; **30**:449-455.

Reason 6: Not relevant test used

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microvascular changes in patients with established coronary heart disease. *Med Clin (Barc)* 2018; **150**:131-137.

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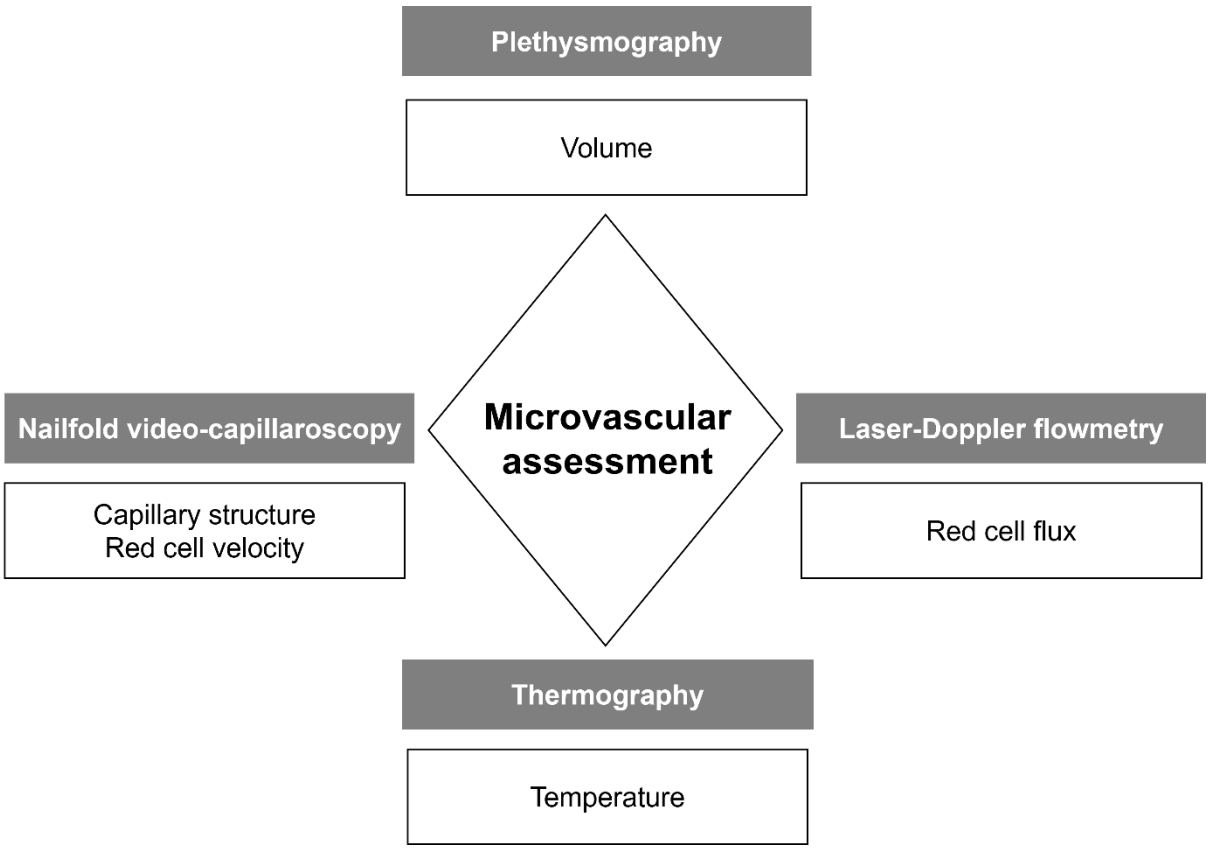
coronary artery disease evaluated by laser speckle contrast imaging.

Microvasc Res 2019; **125**.

Fig. S1 | Assessment of microvascular structure and function



Available microvascular assessments include nailfold video-capillaroscopy (NVC), venous occlusion plethysmography, laser-Doppler flowmetry and thermography. Of the four methods, only NVC assesses microvascular structure. Blood flow may be measured as red cell velocity (NVC), changes in forearm volume (plethysmography), red cell flux (laser-Doppler flowmetry) or changes in temperature (thermography). Red cell flux is the product of capillary density and red cell velocity.

Table S2 | Quality assessment

Reference	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	QR
Yüksel [40]	Y	Y	NR	Y	N	N	N	Y	N	N	N	N	NA	Y	Fair
Colaci [41]	Y	Y	Y	Y	N	N	N	NA	Y	N	N	N	NA	N	Fair
Arvanitaki [21]	Y	Y	NR	Y	N	N	N	Y	N	N	Y	Y	NA	Y	Good
Arvanitaki [31]	Y	Y	NR	Y	Y	N	N	N	Y	N	Y	Y	NA	Y	Good
Arvanitaki [35]	Y	Y	NR	Y	N	N	N	NA	Y	N	Y	Y	NA	Y	Good
Javinani [29]	Y	Y	NR	Y	N	N	N	NA	Y	N	Y	Y	NA	Y	Good
Junqueira [30]	Y	Y	NR	Y	N	N	N	Y	Y	Y	Y	N	NA	Y	Fair
Corrado [32]	Y	N	NR	Y	N	N	N	N	Y	N	Y	N	NA	N	Fair
Voilliot [23]	Y	Y	Y	Y	N	N	Y	N	Y	N	Y	NA	Y	N	Fair
Voilliot [24]	Y	Y	Y	Y	N	N	Y	N	Y	N	Y	NA	Y	N	Fair
Aytekin [39]	Y	Y	NR	Y	N	N	N	NA	Y	N	Y	Y	NA	N	Fair
Riccieri [36]	Y	Y	NR	Y	N	N	N	Y	Y	N	Y	N	NA	N	Fair
Marino [38]	Y	Y	NR	Y	N	N	N	N	Y	N	Y	Y	NA	N	Fair
Huang [20]	Y	Y	NR	Y	N	N	N	NA	Y	N	N	N	NA	Y	Poor
Cheng [25]	Y	Y	N	Y	N	N	N	Y	Y	Y	Y	Y	NA	Y	Good
Hofstee [33]	Y	Y	NR	N	N	Y	N	Y	N	N	Y	Y	Y	N	Fair

Penna [26]	Y	Y	NR	Y	N	N	N	N	Y	Y	Y	Y	NA	Y	Fair
Serné [27]	Y	N	NR	Y	N	N	N	Y	Y	Y	Y	Y	NA	Y	Good
Serné [28]	Y	N	NR	Y	N	N	N	N	Y	Y	Y	Y	NA	Y	Fair
Greidinger [34]	Y	Y	NR	Y	N	N	N	N	Y	N	Y	Y	NA	N	Fair
Ong [22]	Y	Y	NR	Y	N	N	N	N	Y	N	Y	N	NA	N	Fair
Ohtsuka [37]	Y	Y	NR	Y	N	N	N	N	Y	N	Y	N	NA	N	Fair

Abbreviations: QR- Quality rating; Y - Yes; N - No; NR - Not reported; NA - Not applicable