

Publication

Retinal vessel diameters and function in cardiovascular risk and disease

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 4646834**Author(s)** Hanssen, Henner; Streese, Lukas; Vilser, Walthard**Author(s) at UniBasel** [Streese, Lukas](#) ; [Hanssen, Henner](#) ;**Year** 2022**Title** Retinal vessel diameters and function in cardiovascular risk and disease**Journal** Progress in retinal and eye research**Pages / Article-Number** 101095**Keywords** Cardiovascular disease; Flicker light-induced dilation; Microcirculation; Prevention; Retinal vessel diameters

In the last two decades evidence has gradually accumulated suggesting that the eye may be a unique window for cardiovascular risk stratification based on the assessment of subclinical damage of retinal microvascular structure and function. This can be facilitated by non-invasive analysis of static retinal vessel diameters and dynamic recording of flicker light-induced and endothelial function-related dilation of both retinal arterioles and venules. Recent new findings have made retinal microvascular biomarkers strong candidates for clinical implementation as reliable risk predictors. Beyond a review of the current evidence and state of research, the article aims to discuss the methodological benefits and pitfalls and to identify research gaps and future directions. Above all, the potential use for screening and treatment monitoring of cardiovascular disease risk are highlighted. The article provides fundamental comprehension of retinal vessel imaging by explaining anatomical and physiological essentials of the retinal microcirculation leading to a detailed description of the methodological approach. This allows for better understanding of the underlying retinal microvascular pathology associated with the prevalence and development of cardiovascular disease. A body of new evidence is presented on the clinical validity and predictive value of retinal vessel diameters and function for incidence cardiovascular disease and outcome. Findings in children indicate the potential for utility in childhood cardiovascular disease prevention, and the efficacy of exercise interventions highlight the treatment sensitivity of retinal microvascular biomarkers. Finally, coming from the availability of normative data, solutions for diagnostic challenges are discussed and conceptual steps towards clinical implementation are put into perspective.

Publisher Elsevier**ISSN/ISBN** 1873-1635**edoc-URL** <https://edoc.unibas.ch/89205/>**Full Text on edoc** No;**Digital Object Identifier DOI** 10.1016/j.preteyeres.2022.101095**PubMed ID** <http://www.ncbi.nlm.nih.gov/pubmed/35760749>**ISI-Number** MEDLINE:35760749**Document type (ISI)** Journal Article, Review