

Publication

An automated, interactive analysis system for ultrasound sequences of the common carotid artery

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Author(s) Teynor, Alexandra; Caviezel, Seraina; Dratva, Julia; Künzli, Nino; Schmidt-Trucksäss, Arno

Author(s) at UniBasel [Dratva, Julia](#) ; [Künzli, Nino](#) ;

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Structural parameters of the common carotid artery (CCA) have shown to correlate with the risk of cardiovascular disease, but their precise measurement is challenging. We developed an automatic detection system with manual interaction capabilities that can reliably analyze B-mode ultrasound sequences of the CCA over several heart cycles. We evaluated 3824 frames from 40 sequences in two data qualities. Two readers measured the intima media thickness (IMT) and the lumen diameter at two evaluation times (T1/T2). A Bland-Altman analysis of the average IMT showed a bias +/- SD of 0.002 +/- 0.010 mm (T1), -0.004 +/- 0.008 mm (T2) for completely automatic detections and -0.004 +/- 0.010 mm (T1), -0.003 +/- 0.010 mm (T2) for clips with manual corrections. The combination of automated analysis and manual intervention provides precise parameters as biomarkers for the atherosclerotic process and makes the system suitable for large scale epidemiological research, diagnostic and clinical practice

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