AI-Powered Retinal Imaging for Cardiovascular Risk Assessment

Digital retinal photography has been available in optometry for over a decade. Though not required for NHS sight tests, many practices offer it for a broader assessment of retinal vascular health, usually with patients self-funding this element of their eye examination.

AI pattern recognition now enables retinal images to be analysed for predicting current and future health risks, a field known as "Oculomics". Several AI platforms for retinal image analysis are in use globally, with a few small pilot projects currently underway in the UK.

Examples of AI Cloud Platforms

CLAiR Heart Check – TOKU Eye Platform

- The system assesses blood vessel calibre to stratify CVD risk.
- This platform requires access to a specific retinal camera.

Dudley LOC have been funded by a Dudley Public health grant to run a small comparison study of outcomes from the traditional NHS health check and the TOKU platform.

One independent practice that has previously been trained to provide NHS Healthchecks for the previous project is participating in this pilot.

The intention is to upload 400 retinal images, then undertake a NHS Health Check to any patient flagged by the system as ‘at risk’, for comparison of outcomes.

HeartEye – Dr. Noon Platform

- The system assesses blood vessel calibre to stratify CVD risk.
- This AI platform is compatible with a wide range of retinal cameras.

Adopted by an optical practice in Chorleywood, part of Hertfordshire LOC, where the system is self-funded by patients. The practice lead engaged with the local GP team at the outset, so they were aware this system was in use and the potential for referrals for further investigation. He reports that the system integrates easily with their existing equipment and workflow.

Practice case examples indicate how previously undetected CVD has the potential to increase patient experience and practice loyalty:

An asymptomatic 45-year-old flagged as **high risk**, later found to have a **25% carotid artery blockage** and started on statins. This was only investigated because of the CVD risk screening.

A 67-year-old was **diagnosed** with **high cholesterol and blood pressure** after screening using the Dr Noon system.

Recommendations for LOCs and practices

LOCs are encouraged to keep abreast of changes; AI tools are already part of our daily practice and offer great potential to enhance patient care. It is important that we all understand the benefits, risks and limitations of the current tools and keep abreast of AI innovation.

In June 2025, the College of Optometrists issued a statement on AI in eye care, defining a safe, ethical, and evidence-based approach for the UK optical sector.

The interim AI in eye care position statement was developed by The College of Optometrists in collaboration with LOCSU, national optical bodies and expert advisers to enhance diagnostics, efficiency, and access to care while ensuring patient safety, data protection, and workforce training.