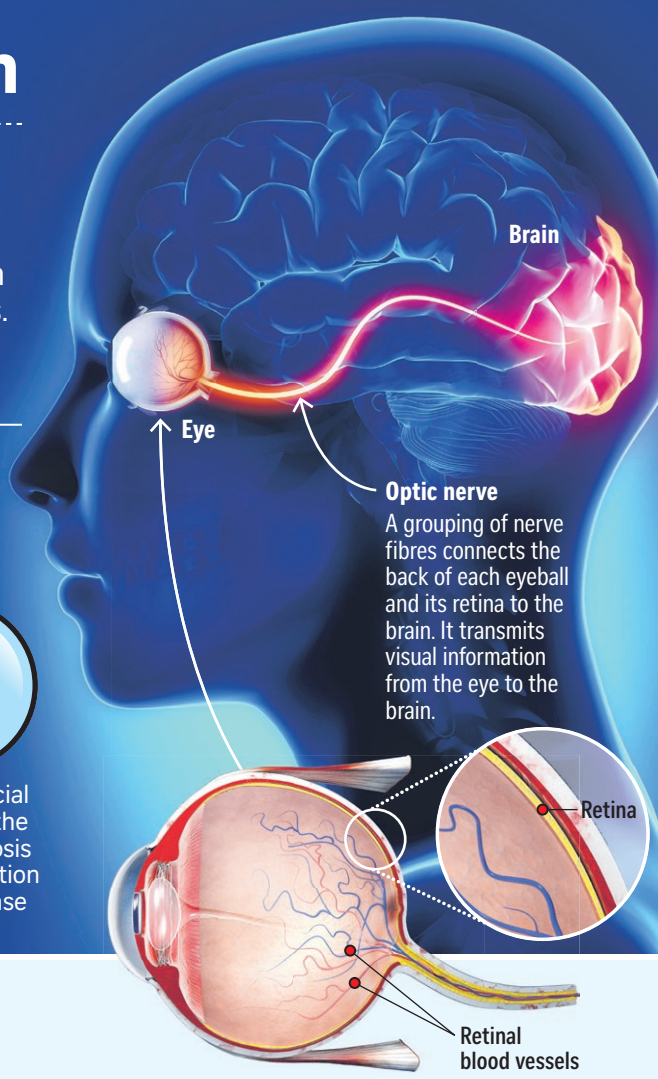
An eye-opener to brain health

Researchers from the Singapore Eye Research Institute (Seri) have found some truth to the long-held belief that the eyes reveal the inner make-up of a person. The eye is connected to the brain, and they share similarities in their nerves and blood vessels. Thus, when one of these organs gets sick, the other can change in telltale ways. **The Straits Times** looks into this study to unveil the intriguing relationship between eye health and cognitive impairment risks.



ABOUT THE STUDY

- Two non-invasive eye imaging technologies – **optical coherence tomography (OCT) and optical coherence tomography angiography (OCTA)** – are used in predicting Alzheimer's disease and mild cognitive impairment (MCI).
- Investigation zeros in on the differences in the eye's **nerve thickness** and **blood vessel density** in individuals with Alzheimer's and MCI.

WHY OCULAR IMAGING?

It is highly appealing to employ ocular imaging in pre-clinical Alzheimer's disease and MCI screening because it is:

Generally non-invasive and thus less intimidating and less lengthy

Readily available and potentially more cost-effective compared with brain imaging techniques

Holds especial promise in the early diagnosis and intervention of the disease

EYE-IMAGING SCANS AND FINDINGS

OCT

What it does

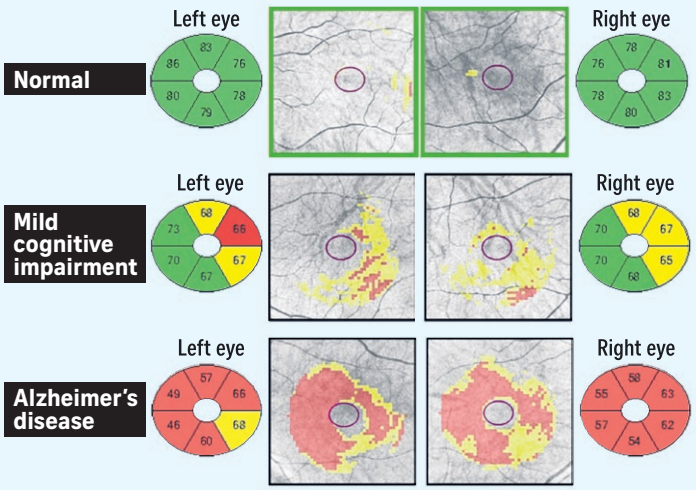
Provides cross-sectional images of the various neuronal layers of the retina.

Nerve thickness is...

Within the normal limits* | Borderline/ suspiciously thin | Outside the normal limits

Decreasing nerve thickness

NOTE: *Compared with the normative database comprising people of the same age.



Findings

People with cognitive impairment had significantly **thinner nerve structures** compared with their counterparts who are without any cognitive impairment.

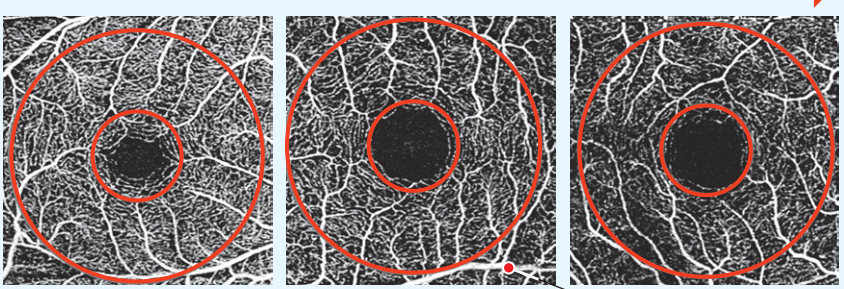
OCTA

What it does

Visualises the smallest blood vessels of the retina.

Normal | Mild cognitive impairment | Alzheimer's disease

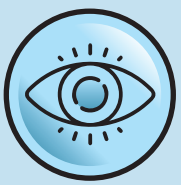
Decreasing vascular density



Findings

People with cognitive impairment had significantly **reduced vascular density** compared with their counterparts who are without any cognitive impairment.

OTHER HEALTH CONDITIONS THAT THE EYE CAN REVEAL



- Heart disease
- High blood pressure
- Diabetes
- **Autoimmune and genetic conditions** (such as rheumatoid arthritis and multiple sclerosis – a chronic disease of the central nervous system)

Source: SERI PHOTOS: SERI, ISTOCK, ADOBE STOCK STRAITS TIMES GRAPHICS