

The main aim of the RECOGNISED project is to understand whether changes that are visible in the retina of the eye can indicate what might be happening in the brains of people with type 2 diabetes, including their risk of developing dementia. To do this, the RECOGNISED clinical study is recruiting a large cohort of people with type 2 diabetes who may also have mild cognitive impairment, to evaluate their retina and brain function, and understand how this might change over time with disease progression.

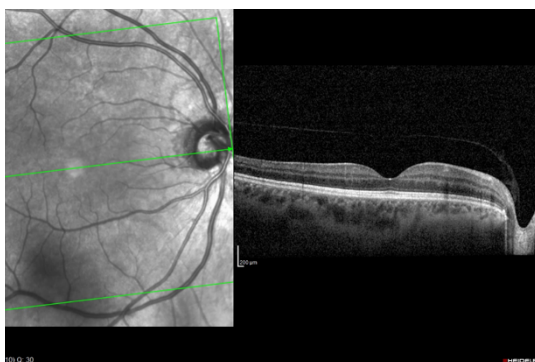
To find out more about the clinical procedures being used in RECOGNISED, we interviewed Prof. Noemi Lois, a clinical professor of ophthalmology at Queen's University, Belfast. Originally from Spain, Prof. Lois is leading the UK arm of the RECOGNISED clinical study, and regularly sees study participants in clinic.

How does the retinal scanning procedure work (ie what do patients/participants experience) and what information does it provide?

We are doing a few tests, as mentioned in the summary of the study, to check the retina. Firstly, we take photographs of the back of the eye with a standard fundus camera. These allow us to check the appearance of the retina. We can see the nerve in the retina and the “neural” tissue, which is similar to the “neural” tissue we have in the brain. We can see also in these photographs the blood vessels, but not really in great detail.



To see the retinal blood vessels very well, we do additional eye tests called optical coherence tomography angiography (OCT-A) and ultra-wide field fundus fluorescein angiography (UWF-FFA). OCT-A is a non-invasive eye test that allows us to see the blood vessels in the macula, which is the area of the retina responsible for our central sight. UWF-FFA requires the injection of a very small amount of a dye called “fluorescein” (only less than half teaspoon is needed for this test) in a vein in the arm/hand. The injection might be slightly uncomfortable for participants, however the advantage of UWF-FFA is that it tells us how well the retinal blood vessels are functioning. UWF-FFA allows us to see all the vessels in the retina, to see if the blood circulates well through them or not, and to see if some blood vessels have died as a result of diabetes, for example.



We also perform anatomical scans of the retina, using a technology called optical coherence tomography (OCT). In these scans, we can see all the different layers of the retina (the different layers of the retina have different cells that have different functions in our retina) so we can determine whether one or other layer of cells are damaged.

Finally, we test how the retina functions in response to light of different intensities and how participants process that information; we do this by a test called “microperimetry”. We also check the function of the retina by doing what we call an “electroretinogram” using a novel technique that allows us to do this test in seconds.

Together, these eye tests and scans give us a lot of detailed information on the anatomy and function of the neural tissue and vasculature (blood vessels) of the retina, allowing us to understand how these characteristics might differ between people with type 2 diabetes with and without mild cognitive impairment and/or dementia.

How does this information tell you about the risk of dementia and diabetes?

This is what we hope to answer in RECOGNISED. At the moment, we only have data based on cross-sectional studies and some epidemiological studies but specific prospective studies as planned in the RECOGNISED study are needed. This will permit us to know whether retinal tests can be used correctly to identify people with type 2 diabetes with or at risk of developing mild cognitive impairment and dementia.

What can people with diabetes do to reduce their risk of dementia?

At present time, the best advice is to maintain a healthy life-style, with regular physical activity and a healthy diet. We would recommend for people that smoke, to try their best to give up smoking. This is already advised to all people with type 2 diabetes, as it is also keeping the diabetes, blood pressure and lipids (cholesterol and triglycerides) well controlled, in order to reduce their risk of developing complications. Unfortunately, even with a healthy life-style some people with diabetes will develop dementia. Although at present there is no treatment that would avoid people developing dementia, we are hopeful that studies such as RECOGNISED would allow these treatments to be developed in the future".