

# Using imaging to monitor diabetic eye disease: Will we see the full picture?

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## Background:

Diabetic retinopathy is a major cause of blindness in the UK<sup>1</sup>, with many losing vision while waiting for assessment and hospital treatment<sup>2</sup>. This project investigates the safety and feasibility of using an 'imaging pathway' to monitor diabetic retinopathy. Imaging pathways are proposed to aid assessment capacity but their safety is poorly evidenced<sup>3</sup>. Currently, the 'gold standard' clinical assessment incorporates an eye examination using a microscope supplemented with a retinal scan (optical coherence tomography - OCT) and a central retinal photograph. An imaging pathway utilises ultra-wide field retinal photography to capture eye health instead of a clinical examination (see Figure 1).

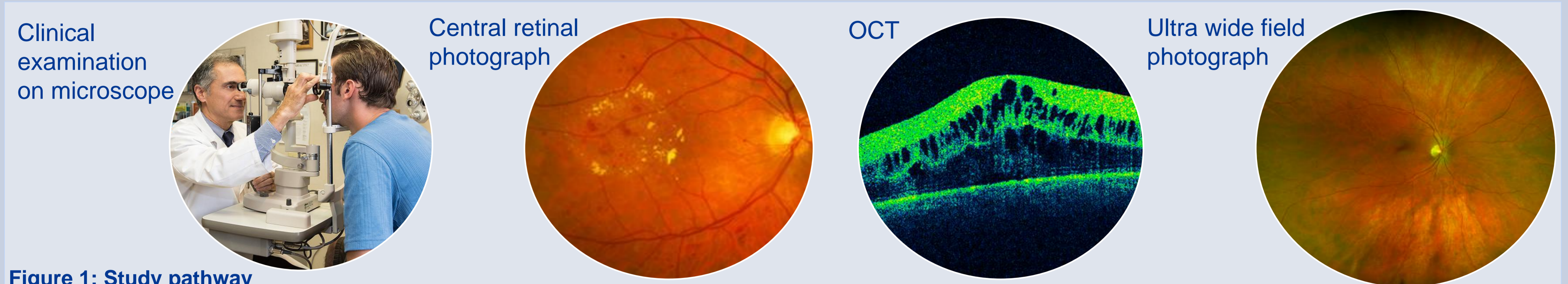


Figure 1: Study pathway

## Methods:

- All patients (July 17th-Sep 28th, 2018) invited to the diabetic retinopathy clinics were risk stratified in the preceding week. Only low risk attending patients were considered.
- Low risk patients had an ultra-wide field retinal photograph in addition to the 'gold standard' clinical assessment.
- Post visit, retinal photographs and OCT scans were assessed by a hospital optometrist (blind to clinical examination results), who assigned a retinopathy and maculopathy classification to each eye, and risk status to each patient.
- Agreement between imaging assessment and clinical examination were calculated at the level of eye and patient.

## Discussion:

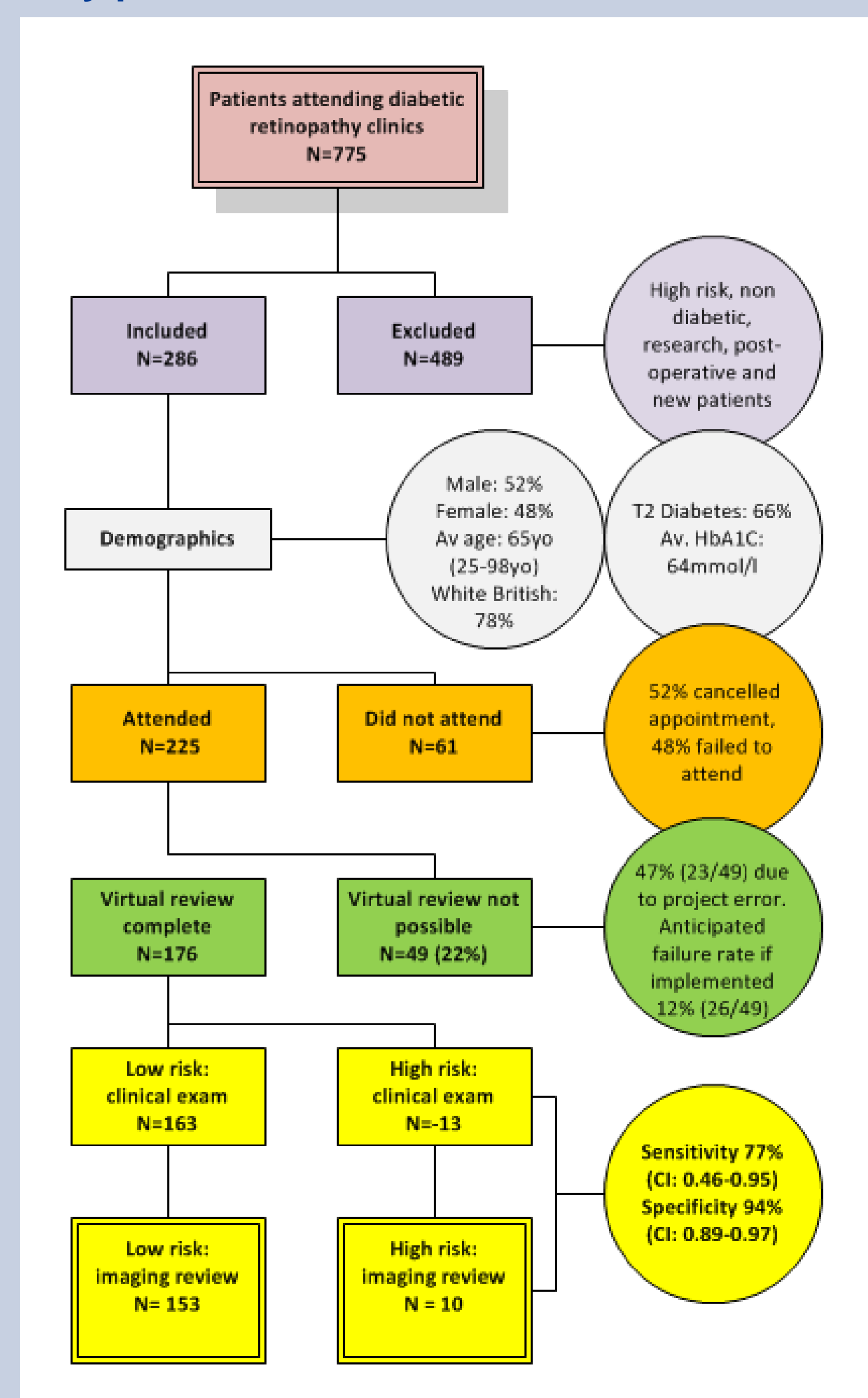
- Failure rates were higher than expected but are likely to reduce if the imaging pathway becomes standard practice.
- Sensitivity (77%) was lower than expected (90%): clinical examination identified an additional three patients moving from low to high risk. However, no disagreements involved the sight threatening level (proliferative retinopathy), but related to the inclusion of severe but non-sight threatening disease in the high risk category.
- Specificity was high (94%): the imaging pathway was accurate at identifying low risk patients.

## Conclusion:

- Imaging pathways have the potential to be a pivotal element in managing low risk diabetic retinopathy. Focusing on sight threatening retinopathy as a cut-off for moving from low risk to high risk will improve sensitivity, and is likely to be clinically appropriate. Further research is warranted.

## Results:

Figure 2: Flow map showing all patients who attended diabetic retinopathy clinics during the study period



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References: <sup>1</sup> C Liew et al. A comparison of the causes of blindness certifications in England and Wales in working age adults (16-64 years), 1999-2000 with 2009-2010. *BMJ Open* 2014;4

<sup>2</sup> <https://www.rcophth.ac.uk/2016/03/increasing-demand-on-hospital-eye-services-risks-patients-losing-vision/> <sup>3</sup> Royal College of Ophthalmologists. The way forward. *J Environ Monit* 2008;10:17