

Stories

Quick low-cost C-peptide test improves diabetes diagnosis

14 May 2025 4 min read

Developing solutions to diagnostic problems in diabetes

Over 3.8 million people in the UK are living with diabetes, and this number is expected to [rise to 6.25 million by 2035](https://www.york.ac.uk/news-and-events/features/diabetes-nhs/) (<https://www.york.ac.uk/news-and-events/features/diabetes-nhs/>). The current cost of direct patient care, which includes treatment and intervention, is estimated at £9.8 billion. As the condition can lead to serious health complications, improving diagnosis and management is a key priority in the [NHS Long Term Plan](https://www.longtermplan.nhs.uk/online-version/chapter-3-further-progress-on-care-quality-and-outcomes/better-care-for-major-health-conditions/diabetes/) (<https://www.longtermplan.nhs.uk/online-version/chapter-3-further-progress-on-care-quality-and-outcomes/better-care-for-major-health-conditions/diabetes/>).

Professor Angus Jones has received 4 career development awards from the NIHR to support his research on improving the classification of diabetes, ensuring patients get the right diagnosis, as well as reducing costs for the NHS.

C-peptide: a quick and cheap test to check the diagnosis

Nine out of 10 cases are diagnosed as type 2 diabetes, but it can be hard to differentiate this from type 1 or other rare forms of the condition. Professor Jones, Associate Professor at NIHR Exeter Clinical Research Facility, explained: "Up to 15% of insulin-treated patients are misdiagnosed. This figure soars to 40% among people who develop type 1 diabetes after the age of 30."

"Treatment for type 1 and type 2 diabetes is very different, which is why being able to confirm that a person has the right diagnosis is so important."

Professor Angus Jones

Professor Jones' NIHR-funded project has transformed [the accuracy of diabetes](https://www.nice.org.uk/guidance/ng17/chapter/rationale-and-impact#diagnosis) (<https://www.nice.org.uk/guidance/ng17/chapter/rationale-and-impact#diagnosis>) diagnosis by developing a quick, inexpensive C-peptide test to measure insulin levels in the blood or urine.

Working alongside NIHR-funded researchers Dr Tim McDonald and Professor Andrew Hattersley, they developed an affordable £10 C-peptide test to measure insulin production. This enables clinicians to confirm whether a person has type 1, type 2, or another form of diabetes, ensuring patients get the right treatment and care.

For the NHS, this means stopping unnecessary insulin therapy in thousands of patients, making significant cost savings while improving patient quality of life. Health economic modelling suggests that routine C-peptide testing could save the NHS millions annually by reducing inappropriate treatments and hospital admissions linked to misdiagnosis.

In practice:

- 7 NHS specialist clinical laboratories in the UK now offer the new urine test, with Dr McDonald's Exeter laboratory receiving over 8,000 NHS referrals annually.
- In Scotland, C-peptide testing is offered routinely to all patients diagnosed with type 1 diabetes.

The team's findings have been incorporated into national and international guidelines, improving the standard of care for people with insulin-treated diabetes worldwide. It's informed clinical guidelines such as [NICE](https://www.nice.org.uk/guidance/ng18/resources/diabetes-type-1-and-type-2-in-children-and-young-people-diagnosis-and-management-pdf-1837278149317) (<https://www.nice.org.uk/guidance/ng18/resources/diabetes-type-1-and-type-2-in-children-and-young-people-diagnosis-and-management-pdf-1837278149317>), the [Association of British Clinical Diabetologists \(.PDF\)](#) (https://abcd.care/sites/default/files/resources/Standards_of_Care_T1DM_ABCD_FINAL.pdf), [Canadian National Guidelines](#) (<https://guidelines.diabetes.ca/browse/chapter3>) and the [American Diabetes Association](https://diabetesjournals.org/care/article/45/Supplement_1/S17/138925/2-Classification-and-Diagnosis-of-Diabetes) (https://diabetesjournals.org/care/article/45/Supplement_1/S17/138925/2-Classification-and-Diagnosis-of-Diabetes).

Helping clinicians act earlier and more efficiently

C-peptide testing is most useful at least 3 years after a patient's diabetes diagnosis, so the initial diagnosis can still be uncertain. With NIHR's support, Professor Jones also developed a model that predicts when a person with diabetes will stop producing insulin.

The NIHR Clinical Research Network then helped to recruit over 1,800 patients with newly diagnosed diabetes to test whether the model can improve patients' early care. The final model will be freely available to health professionals through a website and smartphone app, helping to improve patient experience, health outcomes and cut NHS costs.

Professor Jones's NIHR-funded work has influenced widespread changes in research and clinical practice, including the recommendation that everyone with suspected type 1 diabetes is tested for

islet autoantibodies. This helps to confirm their diagnosis as well as identify whether someone has been misdiagnosed.

“By getting the diagnosis right using tests like C-peptide, or our newly developed prediction models, we can make sure patients have the right diagnosis and therefore receive the best treatment.”

Professor Angus Jones

During his NIHR-funded doctoral research fellowship, Professor Jones investigated the best treatment for patients with type 2 diabetes. Published in the journal [Diabetes Care](https://www.diabetes.org.uk/about-us/news-and-views/cost-complications-highlights-urgent-need-transform-diabetes) (<https://www.diabetes.org.uk/about-us/news-and-views/cost-complications-highlights-urgent-need-transform-diabetes>), the study of more than 950 people confirmed that C-peptide testing identified patients who wouldn't benefit from costly glucose-lowering treatment.

With NIHR support, his team is now refining tools to help clinicians match patients to the most effective and economically viable treatments, improving health outcomes and ensuring public funding is used efficiently.

Reflecting on his career to date, Professor Jones said: “Without a doubt, I would not be a clinical academic today without the support and opportunities I have had from NIHR”.

“NIHR's support has allowed me to develop my research interests and a clinical academic career, as well as contribute to a programme of research that has helped change approaches to classification and management of diabetes internationally.”

Professor Angus Jones

[Professor Angus Jones](https://www.exeterbrc.nihr.ac.uk/people/angus-jones/) (<https://www.exeterbrc.nihr.ac.uk/people/angus-jones/>) is a clinician scientist who combines research in diabetes with work as a consultant physician in the Royal Devon University Healthcare NHS Trust.

This story was first published 27 October 2023 and updated 14 May 2025.

You are reading

Quick low-cost C-peptide test improves diabetes diagnosis

What to read next

Vocational advice intervention leads to reduced musculoskeletal-related work absences

[\(/story/vocational-advice-intervention-leads-reduced-musculoskeletal-related-work-absences\)](/story/vocational-advice-intervention-leads-reduced-musculoskeletal-related-work-absences)

More impact stories ([https://www.nihr.ac.uk/our-research/stories?](https://www.nihr.ac.uk/our-research/stories?f%5B0%5D=story_type%3AImpact%20story)

[f%5B0%5D=story_type%3AImpact%20story\)](https://www.nihr.ac.uk/our-research/stories?f%5B0%5D=story_type%3AImpact%20story)

Latest stories

See all stories (</our-research/stories>)

[\(/story/accelerating-research-delivery-royal-marsden\)](/story/accelerating-research-delivery-royal-marsden)



Stories

Accelerating research delivery at The Royal Marsden

30 January 2026

[\(/story/potential-breakthrough-treatment-resistant-depression\)](/story/potential-breakthrough-treatment-resistant-depression)



Stories

A potential breakthrough for treatment-resistant depression

9 January 2026

(/story/how-artificial-intelligence-transforming-healthcare-data)



Stories

How artificial intelligence is transforming healthcare data

3 December 2025