

Stories

Oesophageal Cancer: How a 'Sponge on a string' is saving lives and NHS resources

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Early diagnosis of oesophageal cancer saves lives

Over 9,000 people in the UK are diagnosed with oesophageal cancer each year. An early diagnosis of this cancer can save lives, but it's often only diagnosed at a late stage when treatment options are limited. [Around 8000 people](https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/oesophageal-cancer#oesophageal_stats1) (https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/oesophageal-cancer#oesophageal_stats1) die from the disease annually.

People with a condition known as Barrett's oesophagus have a higher risk of oesophageal cancer. It is more common among people with severe heartburn and is currently diagnosed and monitored by endoscopy, which is both invasive and expensive.

This means most patients with severe heartburn won't get an endoscopy. This means that 4 in 5 cases of Barrett's oesophagus go undiagnosed and unmonitored. A low-cost, scalable test that helps GPs identify and prioritise patients in need of an endoscopy could significantly improve early detection rates.

Rebecca Fitzgerald OBE, Professor of Cancer Prevention at the University of Cambridge, began work on an innovative solution over 20 years ago. Her answer was the capsule sponge – a sponge on a string – coupled with a lab test for Barrett's oesophagus and early cancer detection for at-risk patients that could be deployed widely in primary care settings. Supported by the [NIHR Cambridge Biomedical Research Centre](https://cambridgebrc.nihr.ac.uk/) (<https://cambridgebrc.nihr.ac.uk/>), an [NIHR Research Professorship award](https://www.nihr.ac.uk/career-development/research-career-funding-programmes/professorships-and-senior-investigators/research-professorships) (<https://www.nihr.ac.uk/career-development/research-career-funding-programmes/professorships-and-senior-investigators/research-professorships>) and [Cancer Research UK](https://www.cancerresearchuk.org/) (<https://www.cancerresearchuk.org/>) (CRUK), Professor Fitzgerald's research progressed from early stage studies through to clinical trials involving thousands of people.

Supporting researchers' life-saving and cost-saving innovations

Professor Fitzgerald's test involves swallowing a pill attached to a string. Once in the stomach, it dissolves to release a sponge, which collects cells from the oesophagus upon removal. These cells are then analysed in a laboratory to identify which patients need further endoscopic examination. The procedure takes just 10 minutes and costs significantly less than an endoscopy.

Early trials showed promising results, and in 2013, the NIHR Academy awarded Professor Fitzgerald a [£2 million NIHR Research Professorship](https://fundingawards.nihr.ac.uk/award/NIHR-RP-02-12-011) (https://fundingawards.nihr.ac.uk/award/NIHR-RP-02-12-011) to further her research. It was during this 5-year award that she led the nationwide [BEST3 trial](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31099-0/fulltext) (https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31099-0/fulltext), which compared capsule sponge testing with standard GP care in over 13,000 heartburn patients.

“The NIHR award provided highly valued funding to expand my research programme and generated crucial evidence to bring capsule sponge testing to more patients. It also created greater visibility within my own organisation, which was essential to advance my career and pursue opportunities for leadership.”



Professor Rebecca Fitzgerald, NIHR Research Professor

Economic and healthcare impact: A more efficient use of NHS resources

The trial's evidence soon translated into changes in practice. During the COVID-19 pandemic, when routine endoscopies were cancelled, capsule sponge testing was deployed as an alternative, enabling over 10,000 patients to receive potentially life-saving diagnostic testing. Pilots have since included over 25,000 patients, demonstrating that the test can reduce endoscopy waiting lists across England, Scotland, and Northern Ireland. This led to more efficient use of NHS resources for the 1 in 5 patients with oesophageal disease (including Barrett's oesophagus and cancer). Testing was rolled out across [NHS Trusts in Scotland](https://www.gov.scot/publications/endoscopy-urology-diagnostic-recovery-renewal-plan/pages/2/) (https://www.gov.scot/publications/endoscopy-urology-diagnostic-recovery-renewal-plan/pages/2/) in 2020.

In the same year, a [NICE briefing](https://www.nice.org.uk/advice/mib240/chapter/Summary) (https://www.nice.org.uk/advice/mib240/chapter/Summary) highlighted that capsule sponge testing saves £127 per procedure compared with endoscopy, contributing to significant cost reductions across the healthcare system. Earlier cancer diagnoses are also expected to reduce health care costs. “Catching the cancer earlier can save lives by reducing the need for chemotherapy and surgery to remove the oesophagus,” Professor Fitzgerald added.

£127 saved per procedure

A NICE briefing highlighted that capsule sponge testing saves £127 per procedure compared with endoscopy, contributing to significant cost reductions across the healthcare system.

Research during Professor Fitzgerald's award informed clinical practice, including influencing the 2017 [NICE guideline](https://www.nice.org.uk/guidance/ng12) (<https://www.nice.org.uk/guidance/ng12>) on the recognition and referral of suspected cancer. She also contributed to cancer screening policies for the Department for Health and Social Care and [Cancer Research UK](https://www.cancerresearchuk.org/funding-for-researchers/research-opportunities-in-early-detection-and-diagnosis/early-detection-and-diagnosis-roadmap) (<https://www.cancerresearchuk.org/funding-for-researchers/research-opportunities-in-early-detection-and-diagnosis/early-detection-and-diagnosis-roadmap>) and the [European Commission](https://knowledge4policy.ec.europa.eu/blog/new-eu-recommendations-cancer-screening-are-based-science-advice-policy_en) (https://knowledge4policy.ec.europa.eu/blog/new-eu-recommendations-cancer-screening-are-based-science-advice-policy_en).

Now an [NIHR Senior Investigator](https://www.nihr.ac.uk/people/professor-rebecca-fitzgerald) (<https://www.nihr.ac.uk/people/professor-rebecca-fitzgerald>), Professor Fitzgerald is leading the £6.4 million [BEST4 trial](https://fundingawards.nihr.ac.uk/award/NIHR135565) (<https://fundingawards.nihr.ac.uk/award/NIHR135565>), co-funded by [NIHR Health Technology Assessment \(HTA\) Programme](https://www.nihr.ac.uk/explore-nihr/funding-programmes/health-technology-assessment.htm) (<https://www.nihr.ac.uk/explore-nihr/funding-programmes/health-technology-assessment.htm>) and Cancer Research UK. This large-scale study is inviting at-risk patients for a Heartburn Health Check to determine whether capsule sponge screening can prevent cancer deaths and reduce treatment side effects. The trial will also investigate if the capsule sponge can successfully monitor patients found to have Barrett's oesophagus.

Recruitment for the trial, supported by the [NIHR Research Delivery Network](https://rdn.nihr.ac.uk/) (<https://rdn.nihr.ac.uk/>), is being conducted via NHS Research text messaging, and is expected to reach 120,000 patients. "It's exciting to be at the forefront of developments that directly benefit patients' lives and I look forward to the capsule sponge being rolled out for widespread use in GP and other clinics," she said.

Professor Fitzgerald's Research Professorship award was funded by the [NIHR Academy](https://www.nihr.ac.uk/career-development/nihr-academy) (<https://www.nihr.ac.uk/career-development/nihr-academy>).

Recognising the significant impact of this research on patient care and NHS efficiency, the capsule sponge test has been awarded an [NIHR Impact Prize](https://www.nihr.ac.uk/about-us/our-impact/impact-prizes) (<https://www.nihr.ac.uk/about-us/our-impact/impact-prizes>) for outstanding contribution to healthcare innovation.

Read more:

[Research timeline of the capsule sponge test](https://cambridgebrc.nihr.ac.uk/the-cytosponge/) (https://cambridgebrc.nihr.ac.uk/the-cytosponge/): a new diagnostic test to help detect the early stages of oesophageal cancer.

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[The capsule sponge test won an NIHR Impact Prizes award](https://www.nihr.ac.uk/about-us/our-impact/impact-prizes) (https://www.nihr.ac.uk/about-us/our-impact/impact-prizes)

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