

Development of a Label-Free Liquid Biopsy for Early-Stage Cancer Detection

Nerissa E. Thomas, Charles D. Brilliant, Cerys A. Mitchell, Adam Bryant, Peter R. Dunstan, Dean A. Harris.
nerissa.thomas@cansenseltd.com

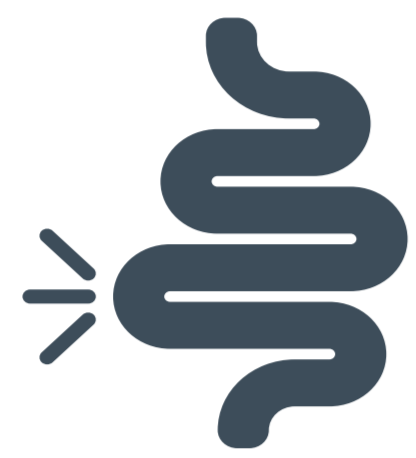
Colorectal Cancer (CRC)



THIRD most common cancer globally



SECOND most common cause of cancer deaths in UK

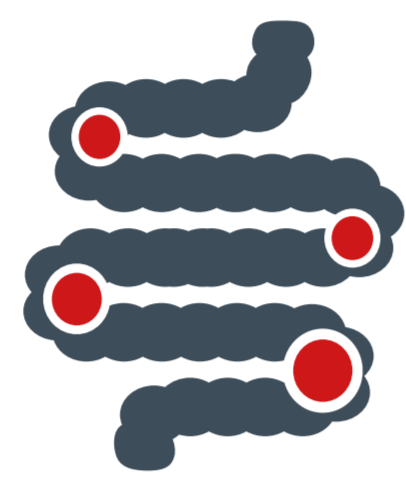


2.2 M & **1.1 M**
new cases & deaths by 2030

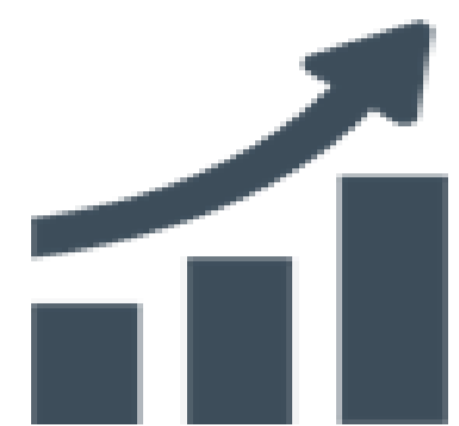


SURVIVAL RATE:

8% vs **95%**
LATE STAGE vs STAGE I



60% Detected at advanced Stage III or IV



Cases rapidly **RISING** in the under 50s

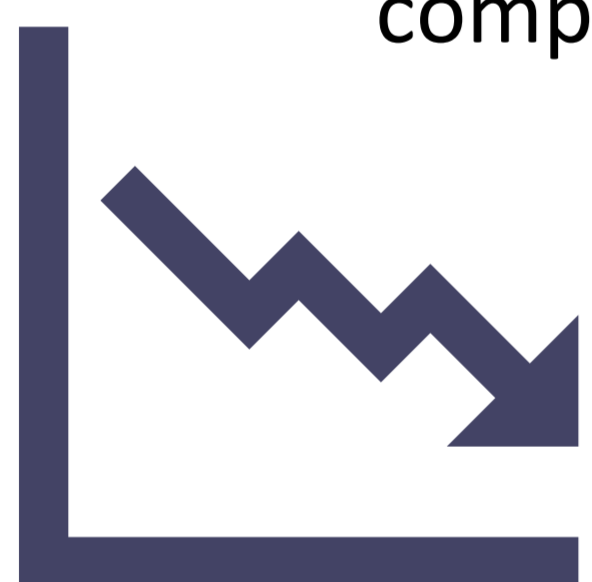
CRC detection

Current CRC detection pathways use the **Faecal Immunochemical Test (FIT)** followed by colonoscopy.

FIT is inexpensive and has reasonable sensitivity for CRC symptomatic detection or screening. However, FIT is also sensitive to benign conditions and has poor capability to detect high-risk adenomas

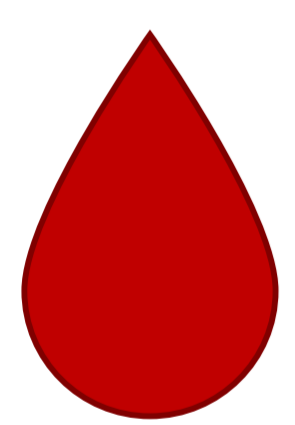


30% & **40%**
FIT Non-completion rate² & Cancer referral pathways not accompanied by FIT²



LOWER rates of FIT return in socio-economically **deprived** and certain **ethnic minority** groups¹.

CanSense-CRC Test Process



FIRST commercial use of **RAMAN SPECTROSCOPY** to detect serum changes specific to **CRC**

Serum metabolites from aberrant lipid/protein energy substrate pathways are excited by laser light to produce a vibrational spectral output, akin to a **RAMAN FINGERPRINT**.



A **MACHINE-LEARNING ALGORITHM** trained on thousands of spectra classifies spectra based on the likelihood of **CRC**³.

CanSense-CRC

GREATER acceptability of CanSense-CRC blood test



INCREASED inclusivity of cancer detection to those at greatest need

CLINICAL VALIDATION of the MVP with 1,500 blood samples from UK primary care patients found:

97.8% vs **67%**
Patients completed CanSense-CRC test vs Patients completed FIT

COST SAVINGS

for symptomatic and surveillance pathways.



PROTOTYPE TESTING:

5% & **57.6%**
Reduction in missed cancers & Greater patient acceptability

Compared to the standard care pathway, the use of CanSense-CRC results in **44.13** cancers being detected at **1 YEAR** vs **3 YEARS**⁴



85% Support by clinicians to adopt test into their practice.



EARLIER DIAGNOSIS OF CRC

removing a total of **4593 weeks** wait per 1000 patients⁴

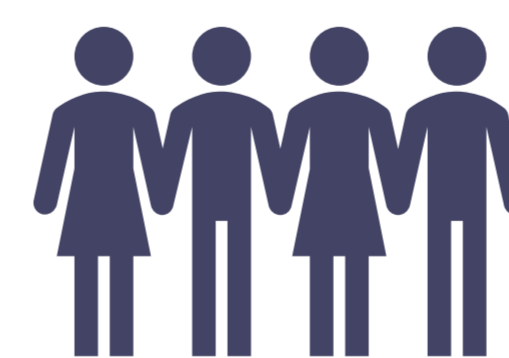
CanSense-CRC Regulatory Approval and Deployment

CanSense-CRC moves the needle toward **IMPROVED CANCER SURVIVAL** through the detection of **early-stage cancer metabolites**.



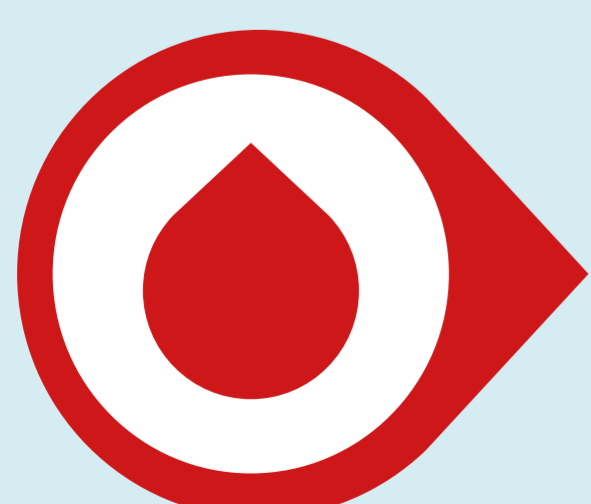
The CanSense-CRC test is in line with the **NHS Long Term Plan** ambition to **detect 75%** of cancers at **stage I/II** by 2028.

CanSense is working toward **UKCA mark** and **ISO13485** accreditation, having completed the ISO13485 Stage 1 audit and progressing to the Stage 2 audit in October 2024.



The CanSense-CRC test has the potential to rebalance the current **SOCIOECONOMIC EQUALITY** around testing in the UK.

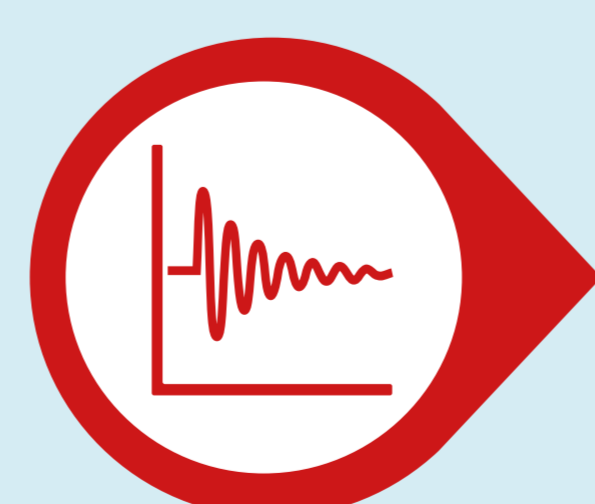
CanSense-CRC can **OVERCOME CHALLENGES** due to limited colonoscopy resources and offers an **alternative to faecal testing**.



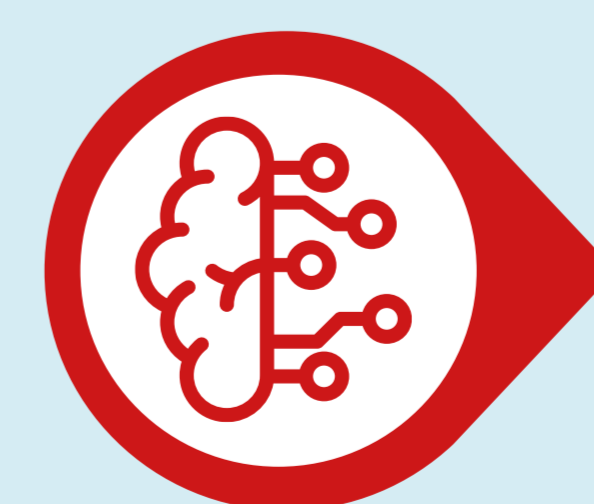
Patient serum collected



Application of Raman Spectroscopy tool



Raman Spectral output



Machine learning algorithm



Diagnosis

References

1. Bailey JA et al. Br J Gen Pract 2023, e843-849; DOI: <https://doi.org/10.3399/BJGP.2023.0033>
2. NHS Wales FIT dashboard
3. Woods, FE, et al. Applied Spectroscopy 2022, 496-507; DOI: <https://doi.org/10.1364/AS.76.000496>
4. CanSense Health Economic Report, CEDAR