



quicDNA: A True Collaboration Story

Magda Meissner – *Medical Oncologist (Velindre Cancer Centre);
Liquid Biopsy lead (AWMGS)*

Sian Morgan – *Laboratory Director/Consultant Clinical Scientist (AWMGS)*

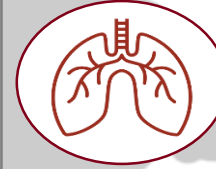
Lewis Egal – *Healthcare Solutions Manager (Amgen);
quicDNA Project Manager (AWMGS)*

Craig Maxwell – *Patient Advocate (quicDNA)*

Lung Cancer in Wales

4th

Lung Cancer is the **fourth** most common cancer in Wales



In Wales, **lung cancer is the leading cause of cancer death**

Overall accounting for more deaths than breast and colorectal cancer combined



The majority of patients are diagnosed at a **late stage** in Wales.

The 1-year survival with stage IIIB and IV lung cancer is poor (15.5%)



Wales consistently has a **lower survival** rate than other parts of the UK.

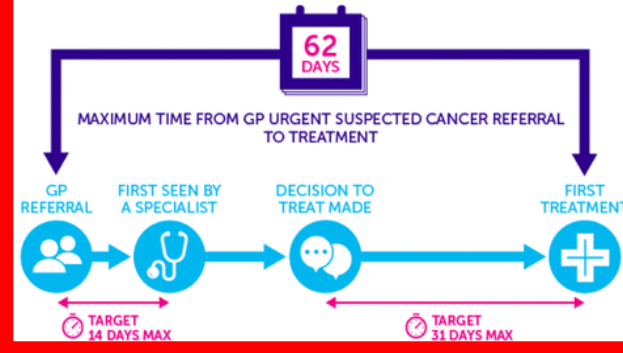
Wales ranked **28th out of 29** European countries for lung cancer survival

A Case for Change



The discovery of genomic targets has significantly advanced and improved treatment options.

THE 62 DAY WAITING TARGET



However, current diagnostic pathways can take about 8 weeks or longer for genomic reports to be delivered.



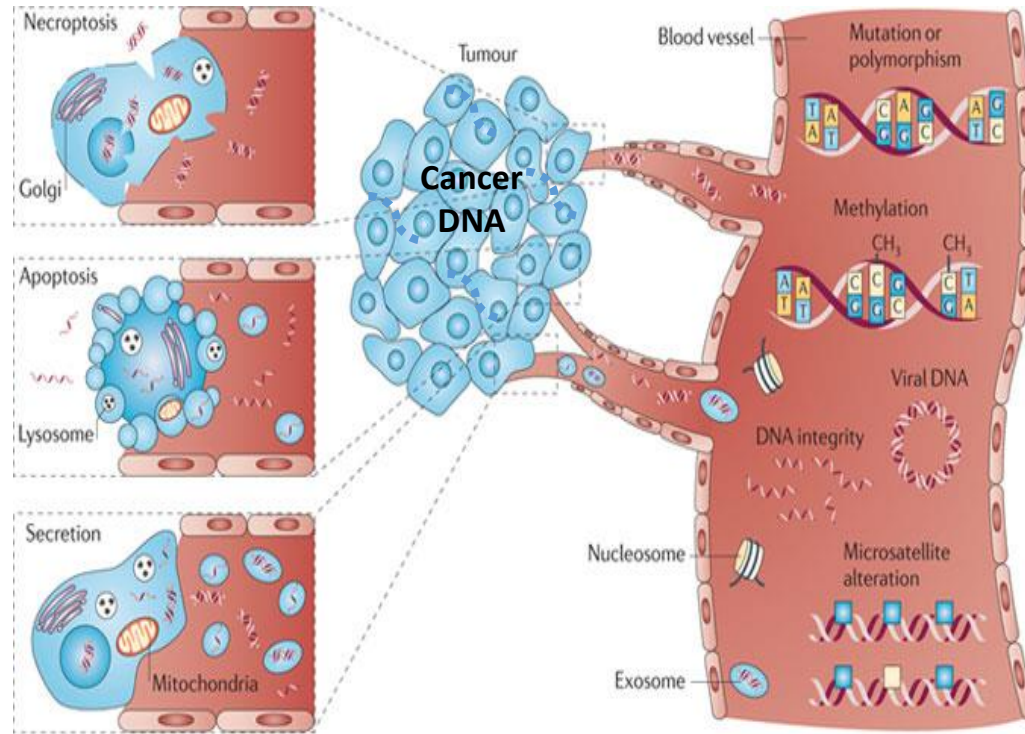
Patients with advanced lung cancer can deteriorate rapidly and die if treatment is not received in time.

There is a critical need to improve and shorten the current diagnostic pathway, and the integration of Liquid Biopsy into the Lung Cancer Pathway could achieve this.

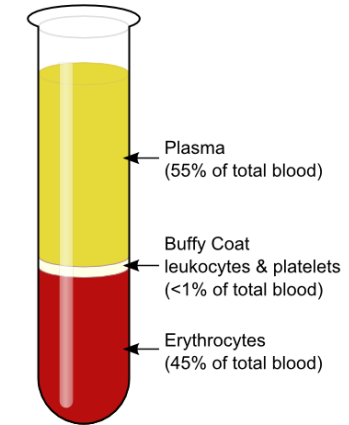
Circulating Tumour DNA(ctDNA)

CtDNA is shed from cancer to the bloodstream

Blood test can establish a cancer genome



Nature Reviews | Cancer

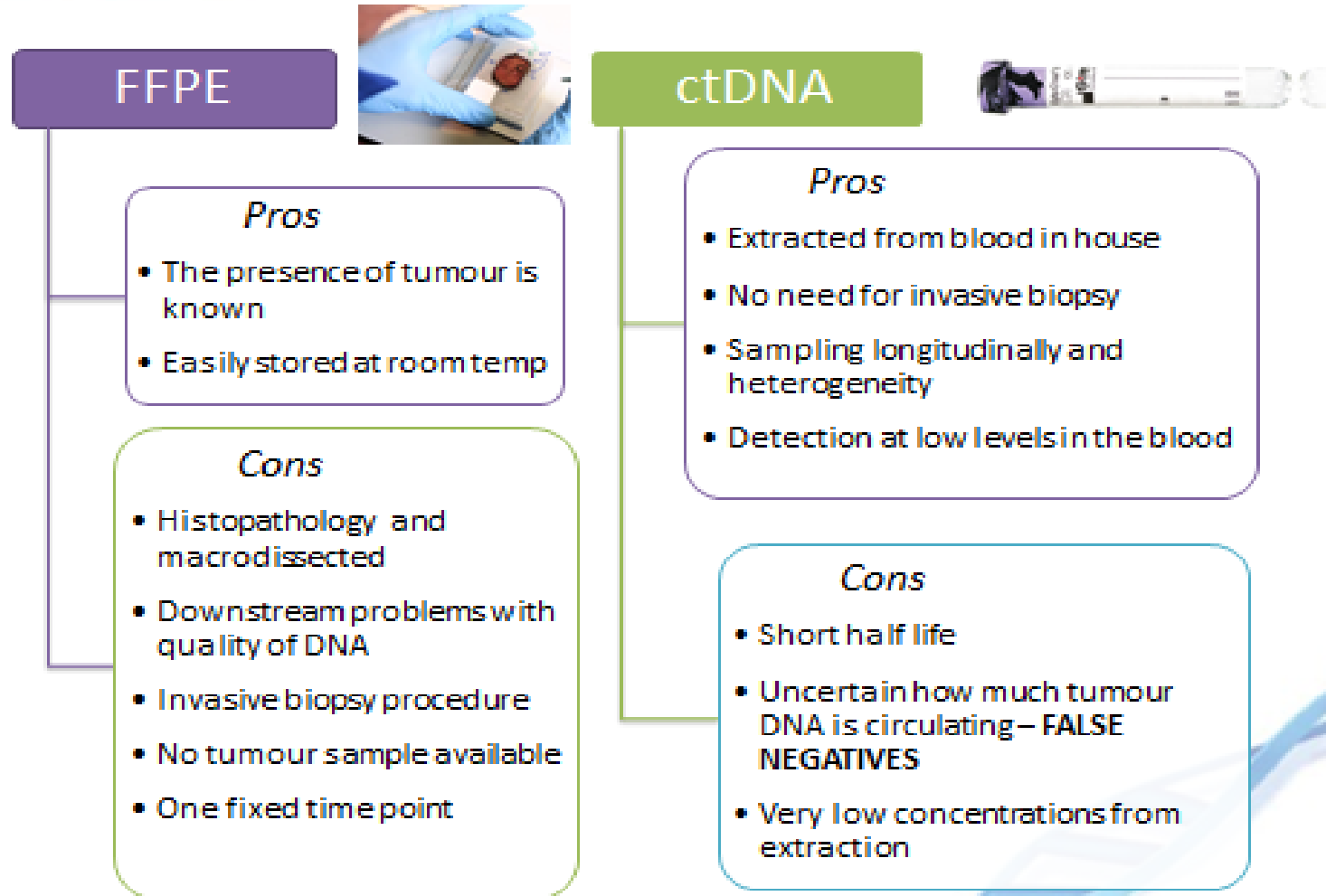


Approx. 10 ml blood

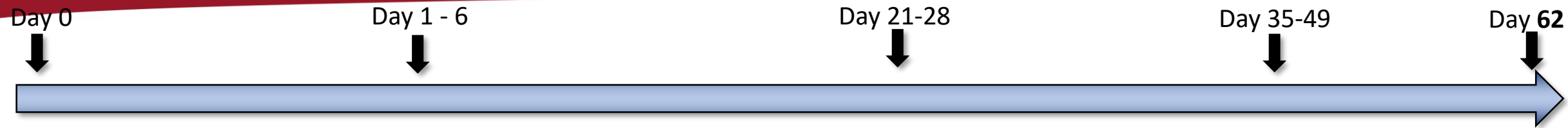
40µl cell-free DNA solution
Variable concentration
(0.5 – 2ng/µl)



A Case for Change



Current Lung Cancer Diagnostic Pathway



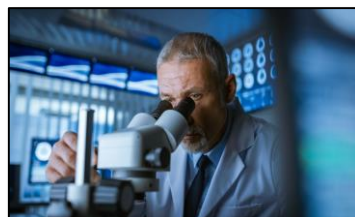
CT/PET scan performed

NSCLC Diagnosed

GP referral with lung cancer suspicion



Rapid Access Lung Clinic



Tissue biopsy (bronchoscopy/CT guided biopsy)



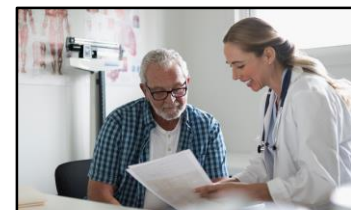
PD-L1 testing



MDT
Histology reviewed with CT scan

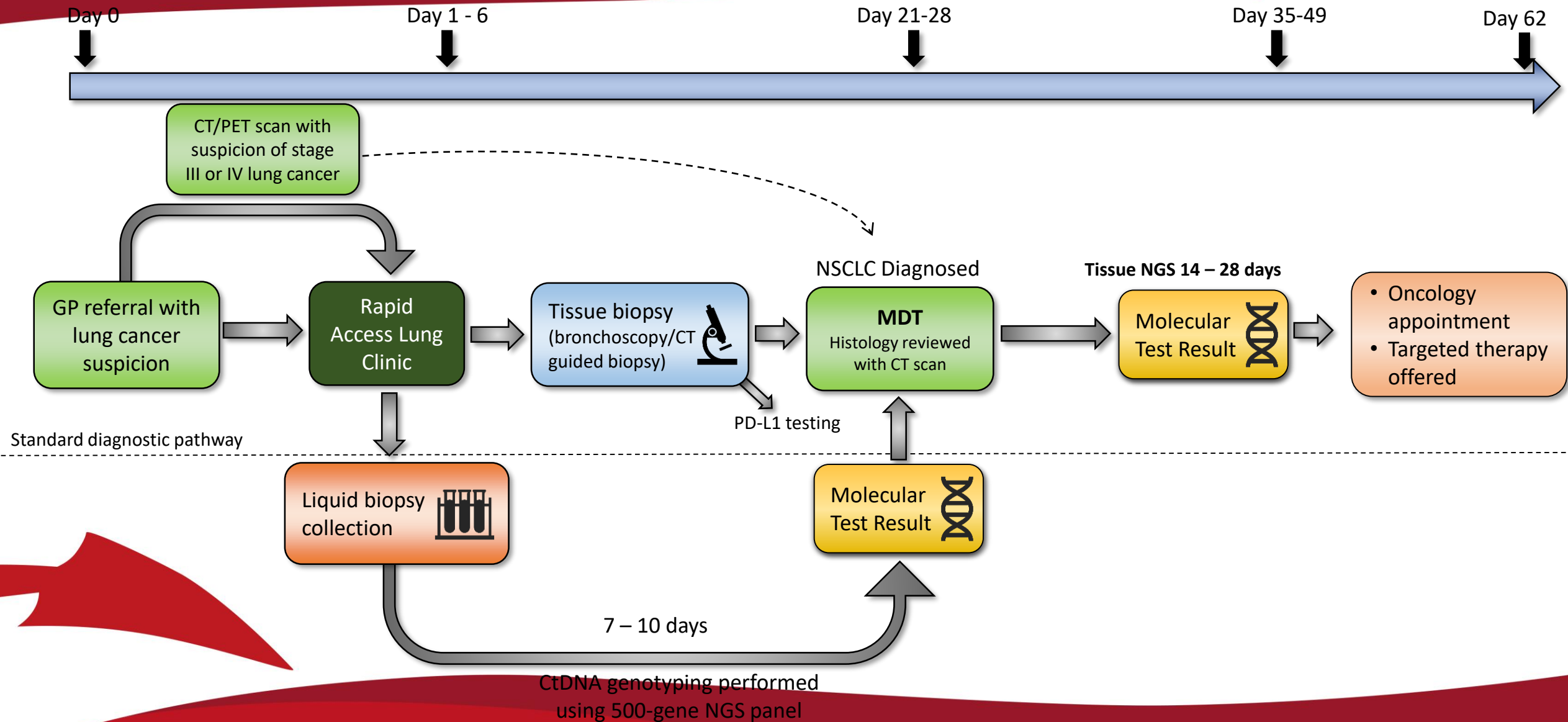
Tissue NGS - 14 – 28 days

Molecular Test Result

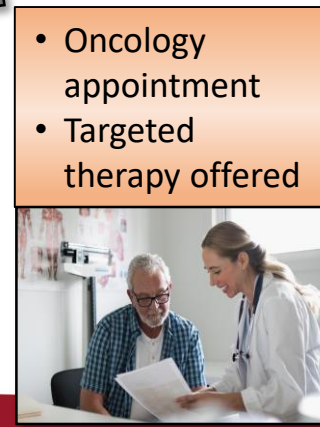
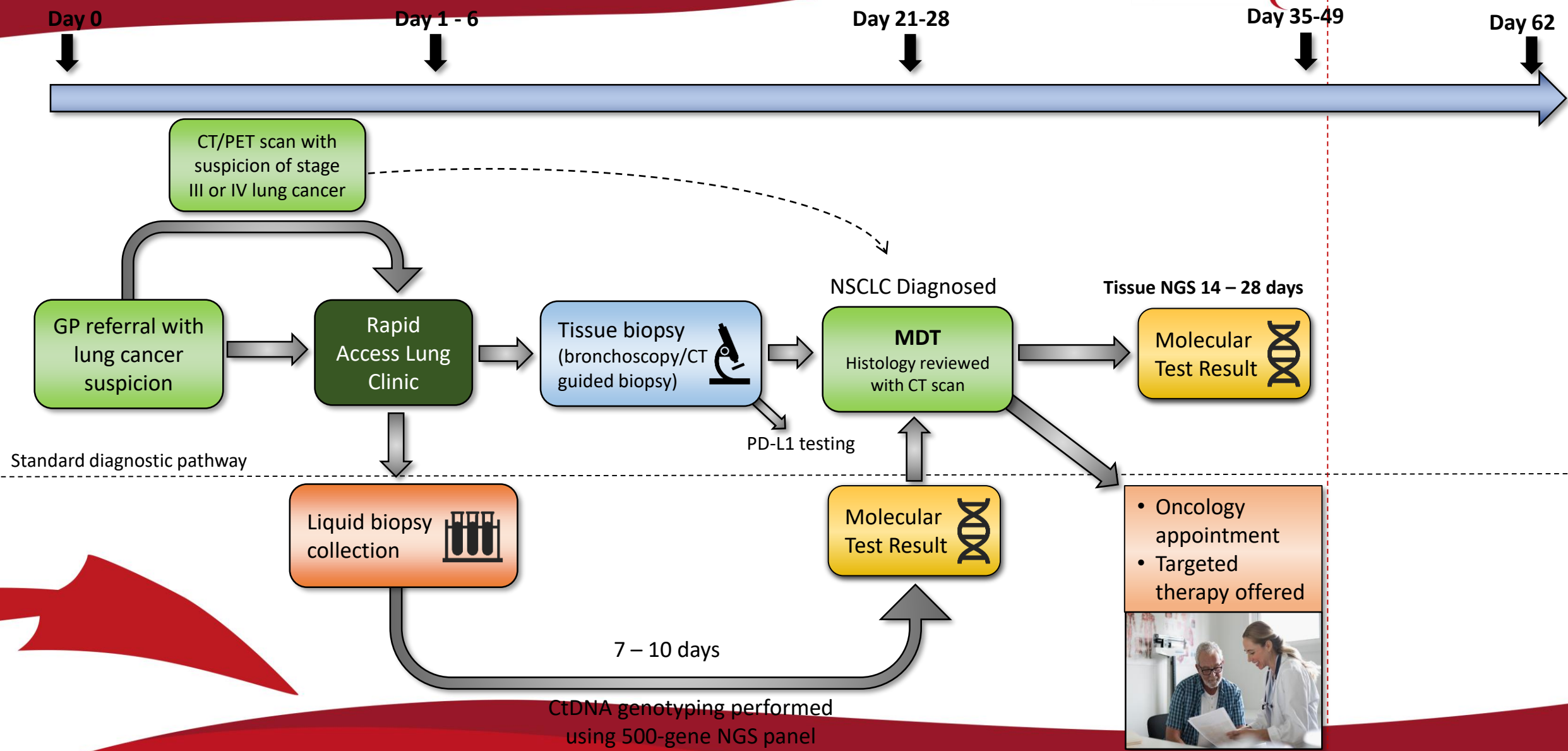


- Oncology appointment
- Targeted therapy offered

Diagnostic pathway with addition of liquid biopsy testing



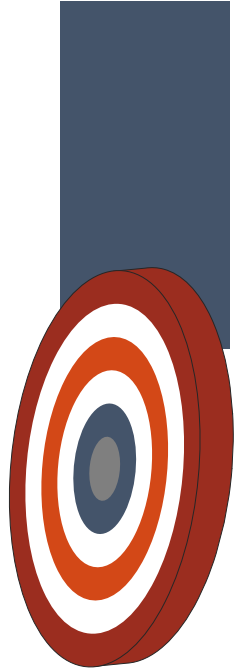
*New Lung Cancer Diagnostic Pathway



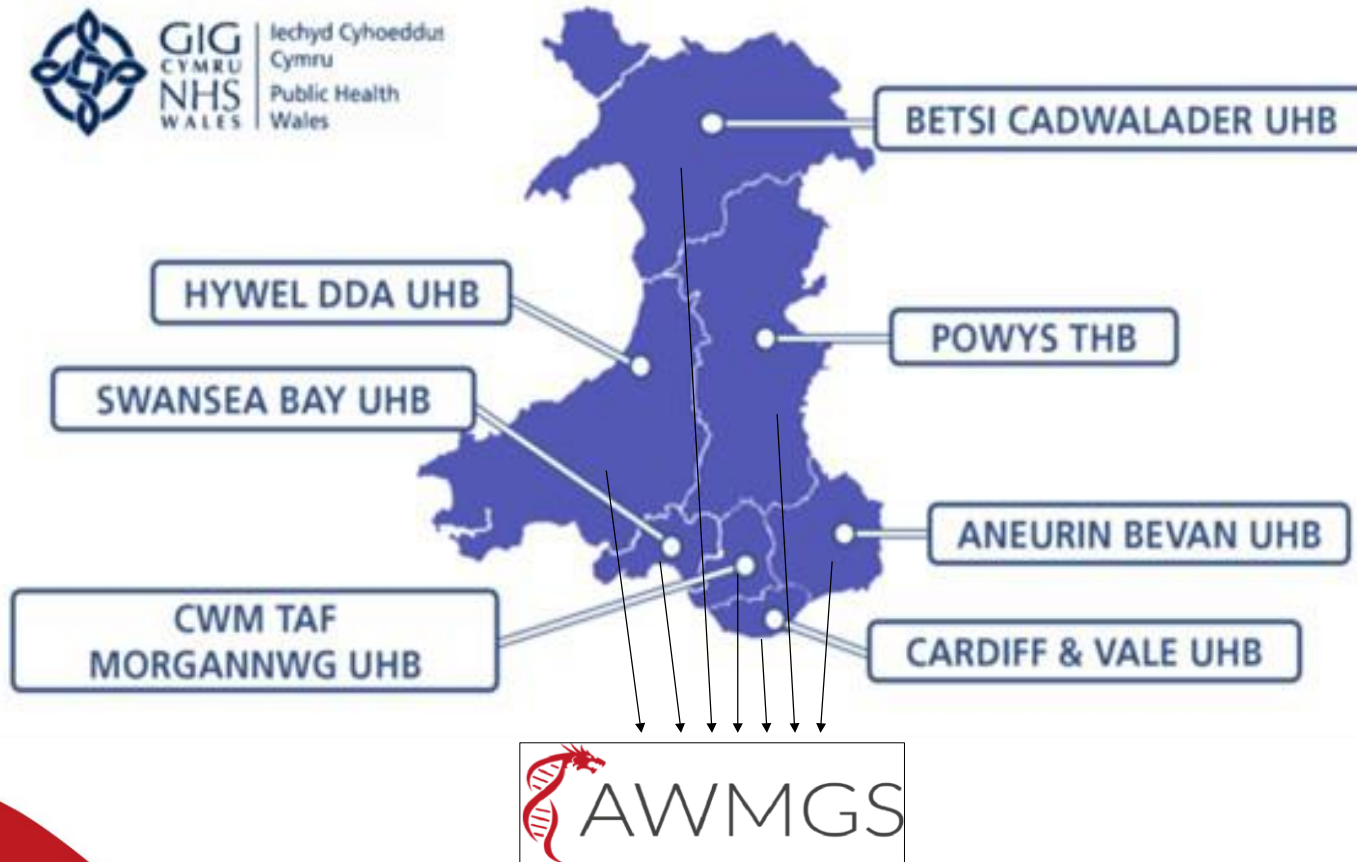
quicDNA: Project Goal



To evaluate the **integration of ctDNA** testing at an earlier stage in the lung cancer diagnostic pathway in order to **shorten time to treatment** compared to current Standard of Care (SOC), hopefully **increasing** the number of patients that receive **targeted therapy**, and ultimately **improve patient outcomes**.



The Future for ctDNA in Wales



Fully commissioned test for all Welsh Health Boards

Feasibility demonstrated in lung cancer to inform the design and delivery of ctDNA diagnostics across multiple tumour types

Develop an anonymised database of genetic variants for the benefit of future patient analysis and research

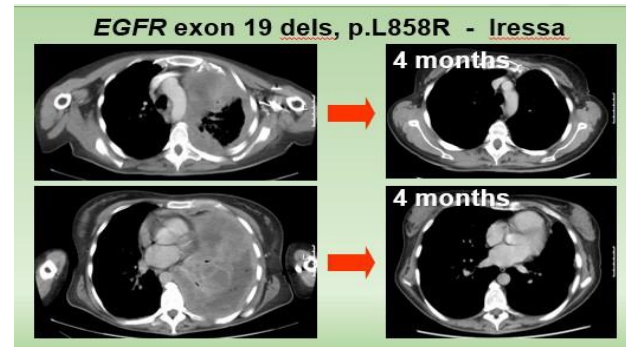
Multi-gene solid tumour panel launched August 2021

NATIONAL CANCER INSTITUTE PRECISION MEDICINE IN CANCER TREATMENT

Discovering unique therapies that treat an individual's cancer based on the specific genetic abnormalities of that person's tumor.



<https://www.cancer.gov/research/areas/treatment/pmi-oncology>



Cancer: New gene tests mean Welsh patients could avoid chemo

By Ben Price
BBC News

© 23 September 2021



'I have stage four cancer but avoided chemotherapy'

Thousands of Welsh cancer patients will be able to live longer without chemotherapy thanks to a new gene-testing service.

Discovering unique therapies that treat an individual's cancer based on the genetic alteration found in the tumour

LUMYKRAS™ (sotorasib) is indicated as monotherapy for the treatment of adult patients with KRAS G12C-mutated locally advanced or metastatic NSCLC, who have progressed on, or are intolerant to, platinum-based chemotherapy and/or anti-PD-1/PD-L1 immunotherapy

Images from a consented patient treated at <https://www.bbc.co.uk/news/uk-wales-58654240>. Provided for illustrative purposes

Genomics Delivery Plan for Wales



**Genomics Delivery Plan
for Wales**

2022 – 2025



Genomic medicine has the potential to save costs and improve quality of care by targeting treatment, maximizing benefit and reducing side effects.

.....continue to implement liquid biopsy within the NHS Wales national cancer optimal pathways to identify patients with clinically actionable gene targets (personalised treatment)



QuicDNA journey so far...



Illustrina TSO500 ctDNA panel Validation

- Feb 2021 - Prostate cancer RING trial by EMQN on behalf AZ
- Supported by **Welsh Cancer Bank**



Health and Care Research Wales

- **RfPPB**: Research for Patient and Public Benefit grant Awarded Aug 2022
- **Aneurin Bevan UHB** – pilot study
- First PPI involvement



Industry donations and collaborations

- Amgen, Bayer, Illustrina, Astra Zeneca, Lilly,



Launch of QuicDNA study

- New PPI involvement
- At ABUHB
- Expansion to C&VUHB & other HB

Oct 2019

Illustrina's agreement with AWMGS
to collaborate to deliver ctDNA Trusight™
Oncology 500 gene panel



Feb 2022

WCIF – GPMAT working Group

- Liquid Biopsy project presented
- 30+ attendees from interested life sciences and NHS stakeholders
- Supported by **Tenovus Cancer Care**



Oct 2021 - Aug 2022

Oct - Dec 2022

Moondance Cancer Initiative

- Early detection & Diagnosis Grant Awarded Dec 2022



2022 - 2023

March /April 2023

2 MILLION POUND INVESTMENT

- 5 INDUSTRY ORGANISATIONS
- WELSH GOV. SUPPORTING (RFPPB)
- MOONDANCE, TENVOUS SUPPORTING
- NHS HEALTH BOARDS SUPPORTING
- CENTRE FOR TRIALS RESEARCH (CTR) CARDIFF UNIVERSITY

ctDNA Extraction + TapeStation



Library prep/sequencing/pipeline



3 days library prep – load NovaSeq at end of day 3



Sequencing – 36hrs (S2) / 44hrs (S4)



Bioinformatics pipeline - 19hrs (S2) / 36hrs (S4)



Reason for Referral :

Analysis of EGFR, BRAF, KRAS and MET hotspots, and ALK, ROS1, RET and NTRK1/2 whole genes for gene rearrangements performed on cfDNA from a blood sample from this patient with suspected lung adenocarcinoma. Please note the clinical interpretation for this patient is based on the assumption that the diagnosis will be confirmed as lung adenocarcinoma. This analysis has been performed for the QuicDNA study.

Conclusion: Sample non-informative for patient management. No actionable variants detected in EGFR, BRAF, KRAS and MET. No actionable gene rearrangements involving ALK, ROS1, RET, NTRK1, NTRK2 or NTRK3 detected.

Genomic analysis of a tumour sample is required to guide this patient's treatment with targeted therapies.

No currently actionable single nucleotide variants or small indels in EGFR, BRAF, KRAS and MET hotspots and no gene rearrangements involving ALK, ROS1, RET and NTRK1/2/3 were detected in this patient's cell free DNA sample (blood sample collected on: 28/03/2023). As we are unable to assess whether the cell-free DNA sample was representative of this patient's lung malignancy, this result must be interpreted cautiously and it is not possible to guide treatment with targeted therapies based on this result in isolation [1]. Genomic analysis of a tumour sample from this patient is required to inform treatment with targeted therapies [12].

A non-actionable variant was detected in KRAS: c.35G>T p.(Gly12Val) at 0.12% (+/-0.04%).

The majority of the target regions were successfully sequenced to the required quality standards to detect a variant allele down to 0.5% in a background of wild type DNA. Please note that the cell free DNA obtained was of low concentration; we therefore cannot be confident that testing has achieved the usual degree of sensitivity. Please refer to the technical information for further information on test sensitivity, sequencing quality and sample performance.

Genomic analysis on a tumour sample from this patient may be performed if appropriate [12]. Studies have reported highly concordant results for cfDNA and tumour samples but discordant results do sometimes occur [2][3]. Please note that any variants reported here have not been confirmed as originating from this patient's lung malignancy. Due to the complex nature of cancer testing it is possible that discordant results will arise during tumour testing. Any discordant results will not be commented on in the report for the tumour sample.

If you would like to discuss this patient's results please contact the QuicDNA team on Quic.DNA.CAV@wales.nhs.uk.

The implication of this result for this patient should be determined in the context of this patient's full clinical details.

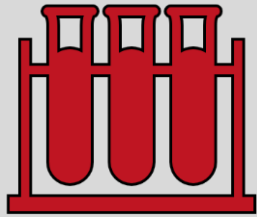
**Target number is
1,260 ctDNA tests**

TAT = 14 calendar days

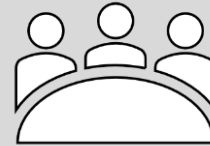
Early results are encouraging...



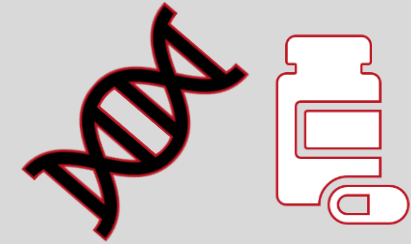
As of 19th June 2023:



**30 samples
received from lung
clinics (ABUHB)**

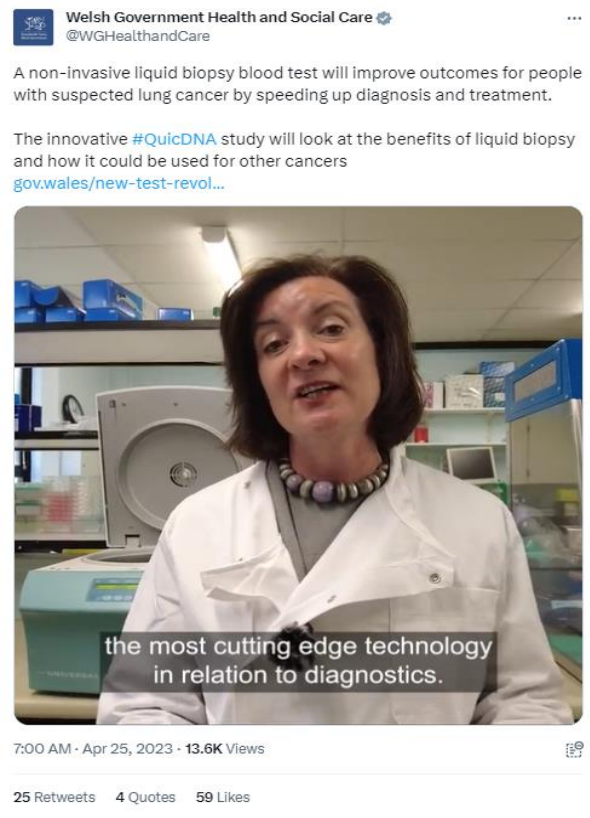


**27 reported on for
MDT discussion**



**5 with actionable variants –
including EGFR, KRAS G12C
and MET**

quicDNA in the media



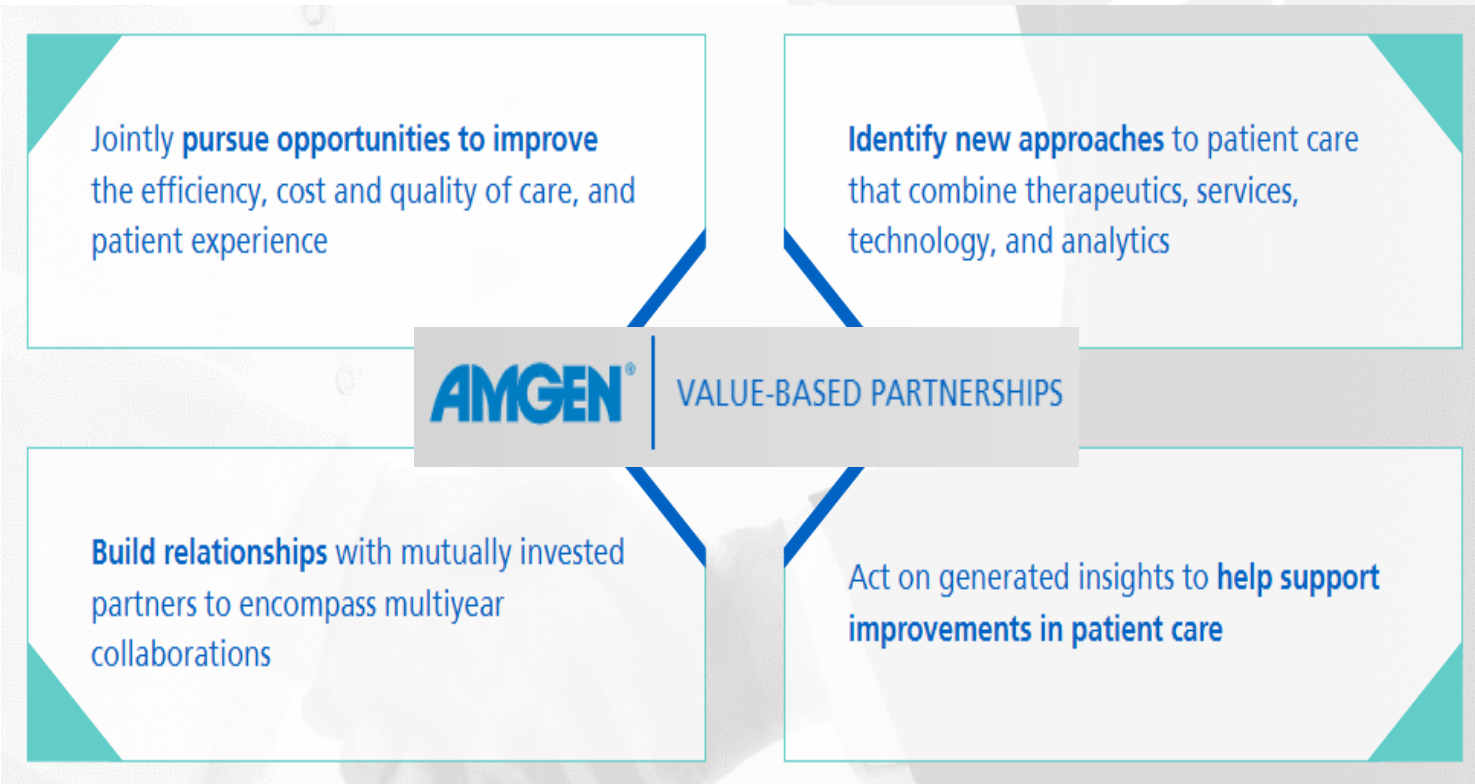
Eluned Morgan MS meets with the AWMGS team leading on the clinical trial of an innovative liquid biopsy test for cancer treatment



Collaborative Partners



Aligning Visions and Goals



Genomics Delivery Plan for Wales

2022 – 2025

"...encourages **collaboration** for mutual benefit with commercial **partners** to invest in Wales."

Welsh Value in Health Centre

Our Strategy to 2024

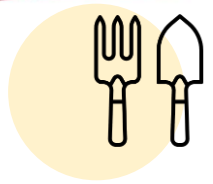
Enabling a whole system approach to value-based healthcare for Wales.

"...a clear roadmap on how to develop, innovate and design **strategic partnerships based on value.**"

A Healthier Wales: our Plan for Health and Social Care

"**Relationships** with important partners, including universities and industry, need to be developed and managed **transparently**, with confidence and assurance."

Growing a Collaborative Working Agreement (CWA)...



Oct 2021

Initial meeting with Magda and Sian (Amgen/AWMGS)



Feb 2022

WCIF co-leads for the GPMAT working group



Mar 2022

Leveraged the WCIF platform to engage industry/third sector for project support



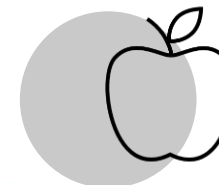
Apr 2022

Identified need for a Project Management support - discussions between Amgen/AWMGS/CVUHB



Apr - Nov 2022

Co-developed a CWA that incorporated Project Management Secondment



Jan 2023 - Present

Beginning of AWMGS secondment – quicDNA Project Manager

Key Learns & Suggestions

Achievable Collaboration is possible

- NHS – Industry
- Industry – Industry
- Third Sector

The Patient is central

- Develop common language
- Common goal
- **Improving outcomes for patients**

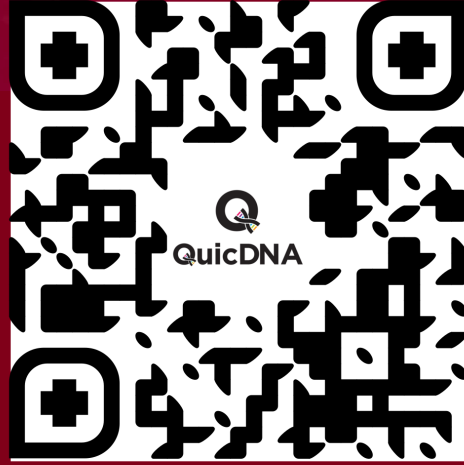


Trust/Transparency is vital

- Open conversations regarding intentions and desired outcomes
- Trusted environments to stimulate meaningful engagement - platforms such as WCIF, ABPI and MediWales

Knowledge is helpful

- Understanding the correct stakeholders needed in the room
- What is the art of the possible?



Craig Maxwell – *Patient Advocate*
(*quicDNA*)

A scenic view of a coastline. In the foreground, a steep, rocky hillside slopes down towards a bay. The water is calm and reflects the overcast sky. The background shows a distant horizon line under a cloudy sky. The overall tone is somewhat somber due to the grey clouds.

AT AGE 60 CRAIG MATWELL WAS DIAGNOSED WITH A
RARE FORM OF GENETIC LUNG CANCER - EGFR

Craig Maxwell supporting **QuicDNA**



Craig Maxwell supporting

QuicDNA



AMGEN®

illumina

AstraZeneca



Lilly



tenovus cancer care gofal cancer



DIOLCH

