Queen Mary University of London
Barts and The London

Barts Cancer Institute

What are we Learning from ctDNA Pilots?

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www.bartscancer.london/centre-for-experimental-cancer-medicine/

Disclosures & Statement Regarding Conflicts of Interest

Honoraria received from AstraZeneca, MSD, Janssen, Pfizer, Bayer and Roche.

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No scientific conflicts of interest to declare.

"I had an appointment to see the oncologist He informed me that I had primary lung cancer. It was a terrible shock – I had never smoked. I knew very little about lung cancer. ***I was told I couldn't start treatment until my tissue had undergone genetic testing****. I was informed that a molecular abnormality was more common in non-smokers and targeted treatments could really help****. But I couldn't have treatment until my genetic test results were back.***

By now I was experiencing terrible back pain. I had an MRI for my back and brain and went on to have radiotherapy on my vertebrae.

I was called back to see the oncologist ***4 weeks after my initial consultation*** *I was EGFR Positive (EXON 19). I could take a once-daily tablet (80mg Osimertinib) to control the disease. It wasn't curative but palliative."*

Julie, Patient with lung cancer

SCAN ME

NHSE GMSA Transformation ctDNA Pilot

Aim:
Provide evidence, including health economics, for the expansion of ctDNA testing to support tumour genotyping from blood

Respiratory Review **I**maging likely metastatic lung cancer

Additional staging tests
PET/CT / MRI

Tissue sampling
CT / Bronch / EBUS)

Pathologist confirms **Lung Cancer**

MDT reviews results

Oncology Review Treatment plan once biomarkers available

2 WW | **Investigations** | **Biomarker Testing**

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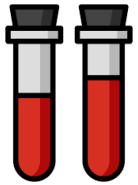
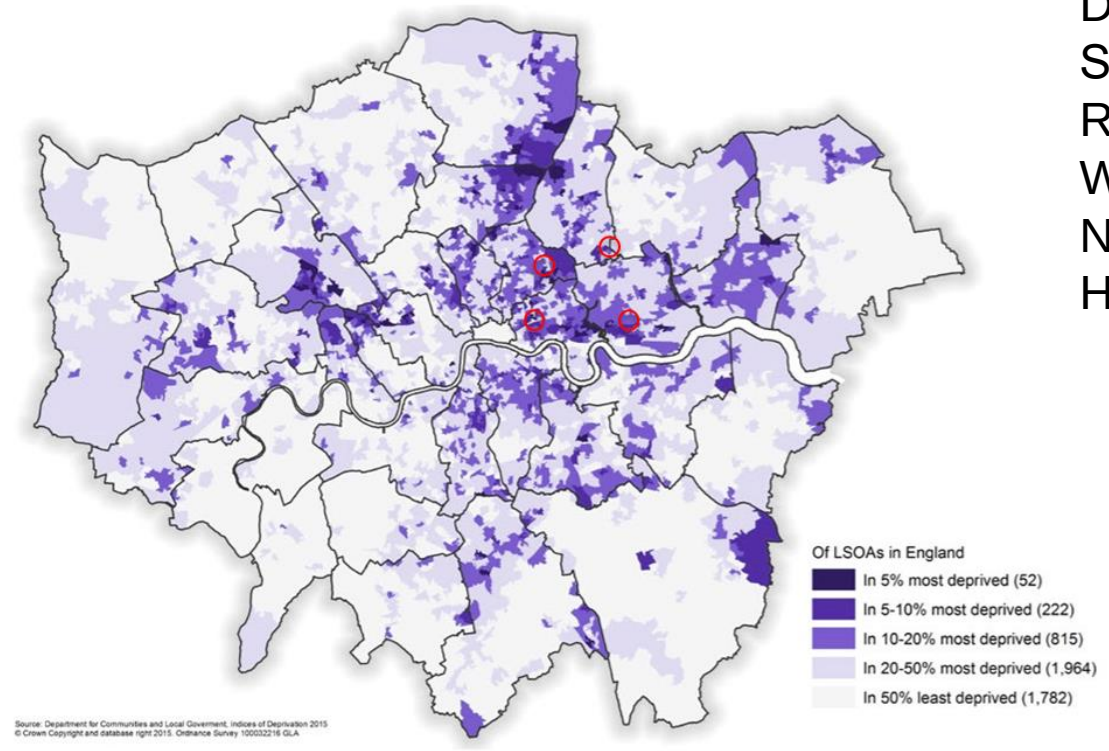
ctDNA Biomarker Testing

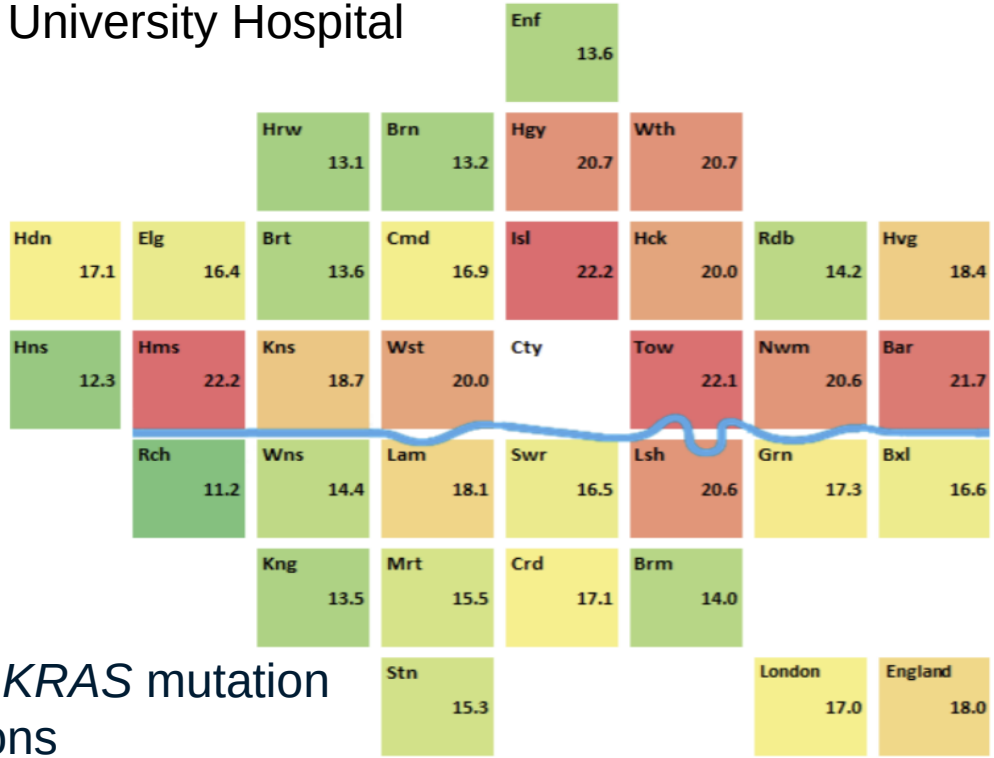


Barts Health NHS Trust



Source: GLA Intelligence Unit mapping of Indices of Deprivation 2015, DCLG

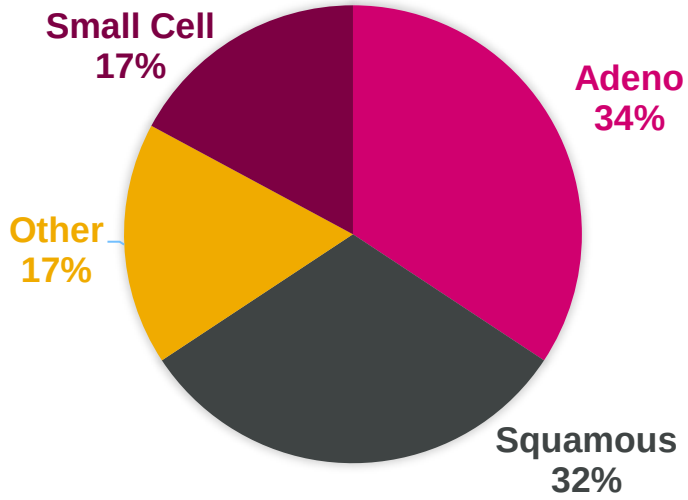
Diagnose and treat **>500 cases per year** across 5 sites:
St Bartholomew's Hospital
Royal London Hospital
Whipps Cross University Hospital
Newham University Hospital
Homerton University Hospital



2016 - 2022:
37.5% of patients have a *KRAS* mutation
18.9% had *EGFR* mutations

Source: Integrated Household Survey, analysed by Public Health England.

Local Data – A snapshot



47 Participants with ctDNA samples

34 Patients with pathological diagnosis of iung cancer (2 benign, 2 other cancers)

Demographics	
Female	23 (49%)
Median Age	64 (26 - 92)
Performance Status	
PS 0	13 (28%)
PS 1	20 (43%)
PS >= 2	9 (19%)
Unknown	5 (11%)
Stage	
Stage 3	8 (17%)
Stage 4	39 (83%)
Smoking Status	
Never Smokers	8 (17%)
Smoker	27 (57%)
Unkonwn	12 (26%)

78% Had an informative sample

12% Cases (3/34) identified additional genomic information (1 x METex14 and 1 x METamp in SqCC and 2 x where insufficient material)

24% Cases (8/34) molecular results were expedited through ctDNA

Local Data – A snapshot

8 cases of targetable :
EGFR L858R
EGFR Ex19del
EGFR G719A
EGFR Ex20ins
ERBB2 Ex20ins
KRAS G12C x 2
MET ex14

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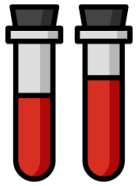
ctDNA Biomarker Testing

Molecular Biomarker Results (days from CT)



Tissue	Median 64 days (Range 32 – 81 days)
ct DNA	Median 29 days (range 7 – 52 days)

What are we learning?

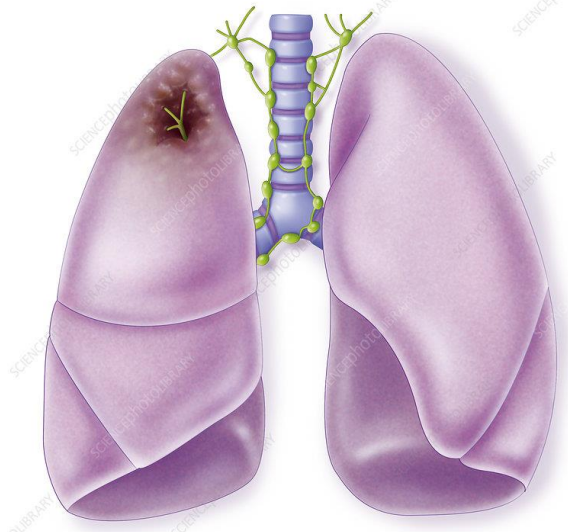
Barts Health NHS Trust

Improved genomic literacy

Increased detection of targetable mutations

+

Expedited treatment for non-oncogenic driven NSCLC



Integration of results to records

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Experience in report interpretation

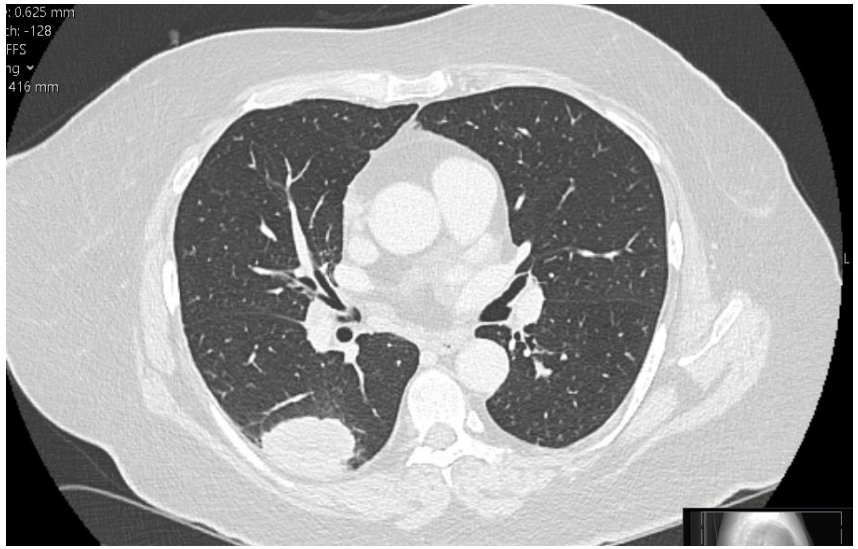
Logistics of additional testing

*NHSE forms changed to allow access with cfDNA result

67-Y-F: Px: Persistent cough

Ex-smoker (15 yrs)
PS 1
PMx: Depression, Osteoarthritis

T2b N3 M1c adenocarcinoma of the lung
PDL1 2%, EGFR/ALK wild type



BEFORE CHEMO-IO

D0: CT demonstrated metastatic cancer
+D8: ctDNA sent
+D16: ctDNA report – *KRAS* G12D
+ D35: EBUS
+ D47: Pathological diagnosis of adenocarcinoma
+ D59: Started 1st line Pemetrexed / Pembrolizumab / Carboplatin
+ D70: Tissue molecular biomarker report

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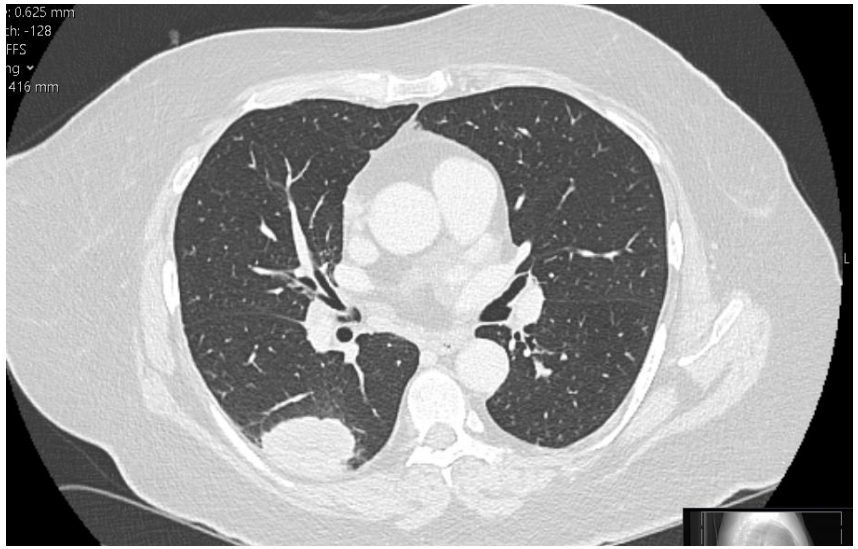

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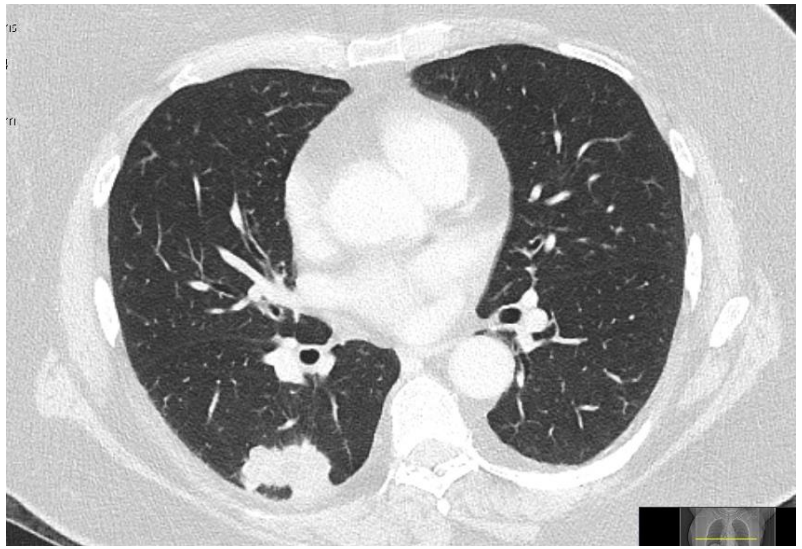

After 4 cycles

Summary and Conclusions

- **Local level data suggests improvements in patient pathways and experience**
- **There are broader benefits outside the immediate pathway**
- **Important logistic and organisational considerations to maximise benefits of the ctDNA pilots**
- **Formal health economic review yet to be completed**

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Questions and Discussion

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