

# Young onset dementia - increasing awareness and opportunities for genetic testing. Memory clinics and the NHS Genomic Medicine Service.

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## Genetic Forms of Dementia

- Aetiological sequence changes
- Rare
  - <1% Alzheimer's Disease
  - v. rare in Vascular Dementia
  - v. rare in Lewy Body Dementia
  - > 25% Frontotemporal dementia**
  - and in some rare dementias
- Usually young onset....but not always
- Young onset dementia usually not genetic
- Usually family history....but not always

# Tower Hamlets Diagnostic Memory Clinic



# Genetic testing in the memory clinic in the old days

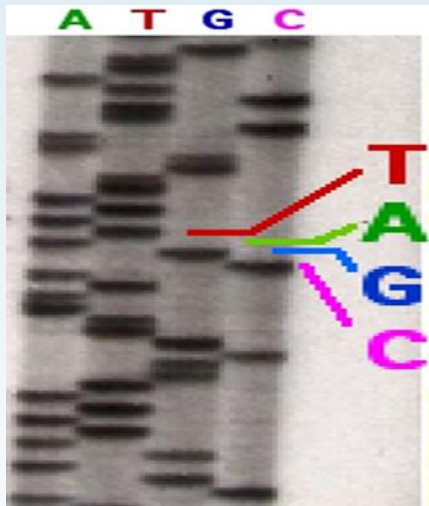
## Theoretically possible, practically impossible

- Diagnostic testing possible for some variants in APP, PSEN1, PSEN2, TAU, GRN, NOTCH3, maybe some others
- One gene at a time, different labs
- Funding

## Onwards referral, long diagnostic journey

- Young onset
- More complex presentation
- Comprehensive local assessment
- NHNN, Queen Square
- Comprehensive assessment
- Genetic diagnosis at end of journey

# Change 1: Next generation sequencing and comprehensive testing



1986-2001

\$3 billion

## Neurodegenerative disorders - adult onset (Version: 2.178)

Relevant disorders: R58, Adult onset neurodegenerative disorder

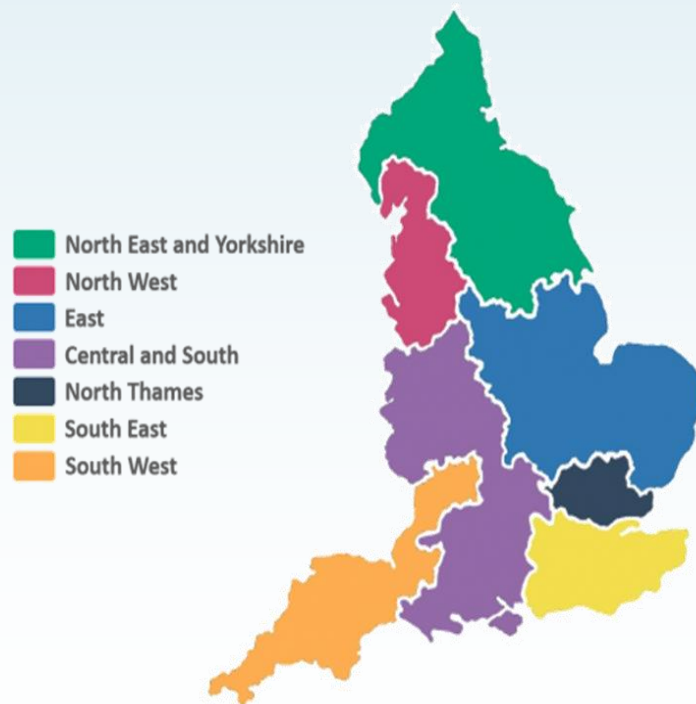
Signed off date: 5 Aug 2021

Panel types: GMS Rare Disease Virtual, GMS Rare Disease, GMS signed-off

See this panel in PanelApp

96 green entities

# Change 2: NHS England Genomic Medicine Service 2018



- **NHS Genomic Laboratory Hubs (GLHs)**
- **The National Genomic Test Directory**
- **NHS Genomic Medicine Service Alliances (GMSAs)**

# Central funding and the National Genomic Test Directory



## National Genomic Test Directory

Testing Criteria for Rare and Inherited Disease

v5.2 June 2023 (Official)

### R58 Adult onset neurodegenerative disorder

#### Testing Criteria

Young onset or familial neurodegeneration starting in adulthood with a likely monogenic cause, including:

1. Unexplained dementia
  - a. Age at onset <55 years where acquired causes (e.g. stroke, tumour) have been excluded, OR
  - b. Family history of dementia of the same type and/or family history of MND in a first / second degree relative

#### Requesting Specialties

- Clinical Genetics
- Neurology
- Psychiatry

<https://www.england.nhs.uk/wp-content/uploads/2018/08/Rare-and-inherited-disease-eligibility-criteria-version-5.2.pdf>



# Mainstreaming of genomic investigation and NHS Genomic Medicine Service Alliances

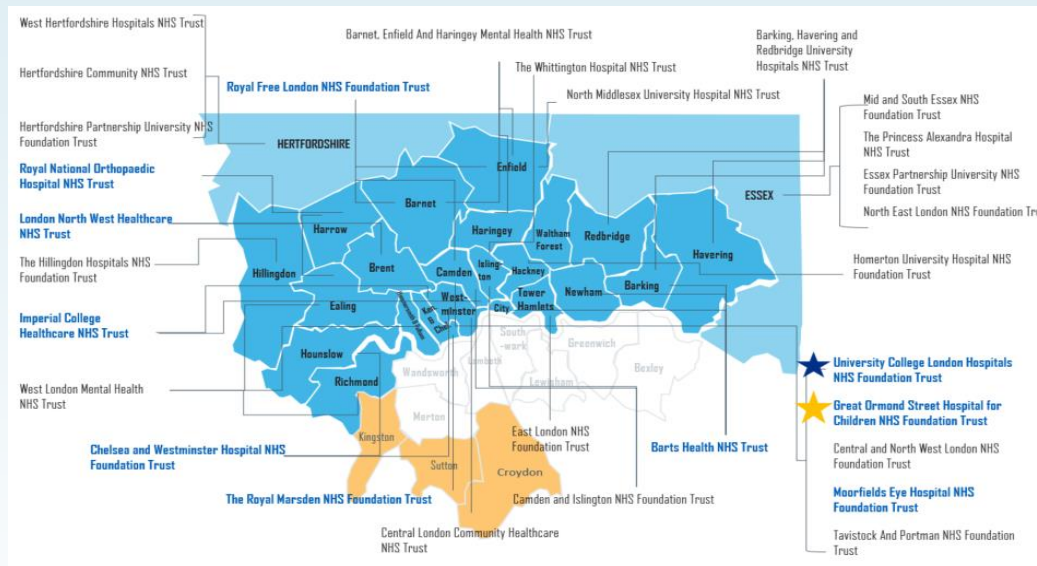
## NHS North Thames Genomic Medicine Service (GMS) Alliance

The NHS North Thames Genomic Medicine Service (GMS) Alliance is one of seven alliances launched by NHS England in January 2021, created to support the systematic implementation of genomic medicine into the mainstream healthcare system and harness the power of genomics to improve the health of our population.

# NTGMSA local transformation project: Embedding genomic testing in memory clinics and intellectual disability services

- **Mapping** mental health and genomic medicine working in North Thames region
- **Consultation** on improving access to and ensuring equity in genomic investigation
- Creation of **model genomic testing pathways** with provision of appropriate **educational resources**

# Mapping use of genomic investigations by memory clinics in North Thames



Request data extracted from North Thames GLH

Test indication	Requests from the 10 NT Mental Health Trusts, 18 months 2021-2022
Adult with ID	9 (6/2155 microarray)
Dementia	0/660

# Consultation on improving access and equity in genomic investigation in memory clinics



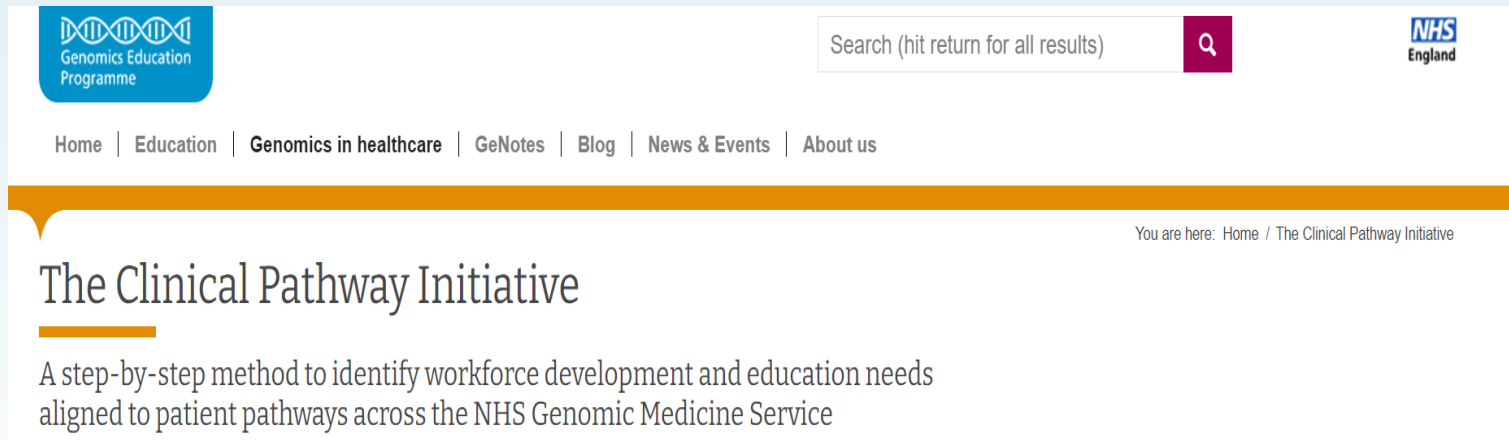
## Patients and carers

- Lack of discussion of genetics
- Post diagnostic support

## Health Care Professionals

- Lack of awareness
- Practicalities of testing
- Relevance to practice

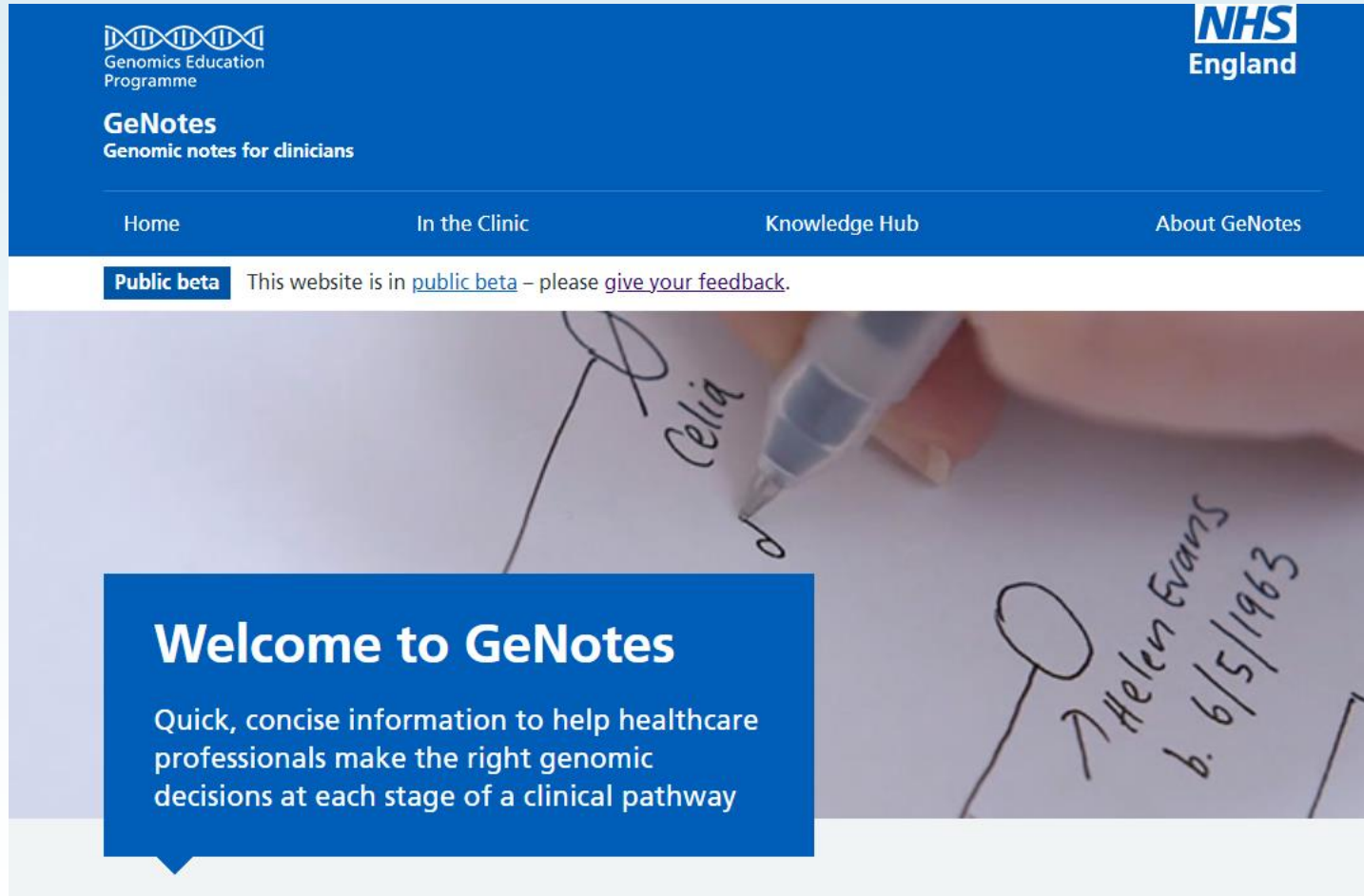
# Embedding genomics into dementia assessment (and care) pathways





The screenshot shows the top navigation bar of the Genomics Education Programme website. It includes the Genomics Education Programme logo on the left, a search bar with the text "Search (hit return for all results)" and a magnifying glass icon, and the NHS England logo on the right. Below the search bar is a horizontal menu with links for Home, Education, Genomics in healthcare, GeNotes, Blog, News & Events, and About us. A breadcrumb trail on the right side of the page reads "You are here: Home / The Clinical Pathway Initiative". The main heading is "The Clinical Pathway Initiative", followed by a sub-heading: "A step-by-step method to identify workforce development and education needs aligned to patient pathways across the NHS Genomic Medicine Service".

<https://www.genomicseducation.hee.nhs.uk/the-clinical-pathway-initiative/>

# Resources to support clinicians with testing



**GeNotes**  
 Genomic notes for clinicians

[Home](#)      [In the Clinic](#)      [Knowledge Hub](#)      [About GeNotes](#)

**Public beta** This website is in [public beta](#) – please [give your feedback](#).

**Welcome to GeNotes**  
 Quick, concise information to help healthcare professionals make the right genomic decisions at each stage of a clinical pathway

# Change 3: Guidelines around testing

## Dementia: assessment, management and support for people living with dementia and their carers

NICE guideline  
 Published: 20 June 2018  
[www.nice.org.uk/guidance/ng97](http://www.nice.org.uk/guidance/ng97)

1.2.18 Do not use Apolipoprotein E genotyping or electroencephalography to diagnose Alzheimer's disease.

1.2.19 Be aware that young-onset Alzheimer's disease has a **genetic** cause in some people.

1.2.25 Be aware that frontotemporal dementia has a **genetic** cause in some people.

1.2.28 Be aware that young-onset vascular dementia has a **genetic** cause in some people.



152.	2	The service has access to specialist post-diagnostic counselling provided by a psychologist or other appropriately qualified professional for people with specific needs  <i>Guidance: E.g. <b>genetic</b> and rarer disorders, and severe adjustment reactions to the diagnosis</i>	19
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165.	3	The service is able to refer to <b>genetic</b> counselling for patients and their unaffected relatives (where there is likely to be a <b>genetic</b> cause for their dementia)	3
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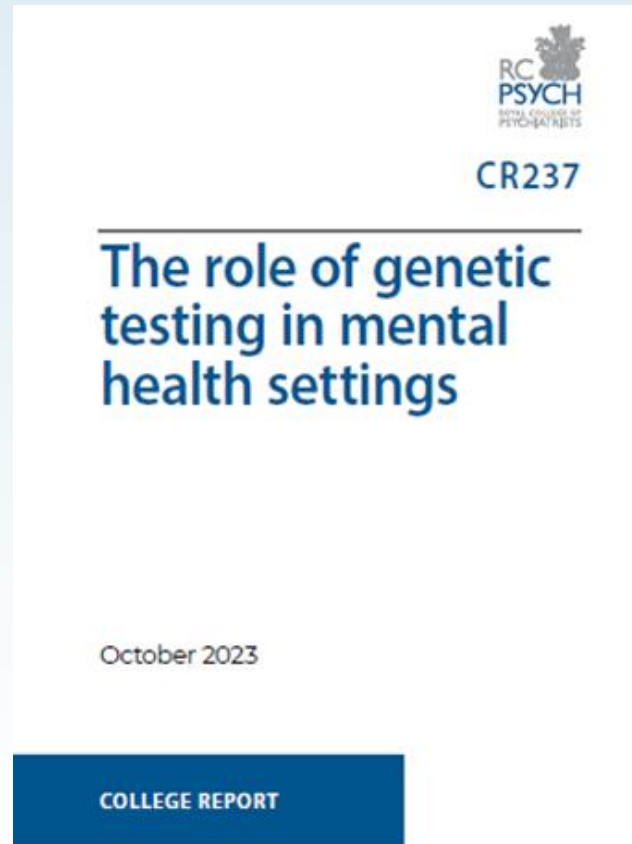
## Old Age Psychiatry

Royal College of Psychiatrists Higher Specialty Curriculum (ST4 - ST6)

Version 1.0

August 2022

# Royal College of Psychiatrists Report



[https://www.rcpsych.ac.uk/improving-care/campaigning-for-better-mental-health-policy/college-reports/2023-college-reports/the-role-of-genetic-testing-in-mental-health-settings-\(cr237\)](https://www.rcpsych.ac.uk/improving-care/campaigning-for-better-mental-health-policy/college-reports/2023-college-reports/the-role-of-genetic-testing-in-mental-health-settings-(cr237))



# Dementia related recommendations

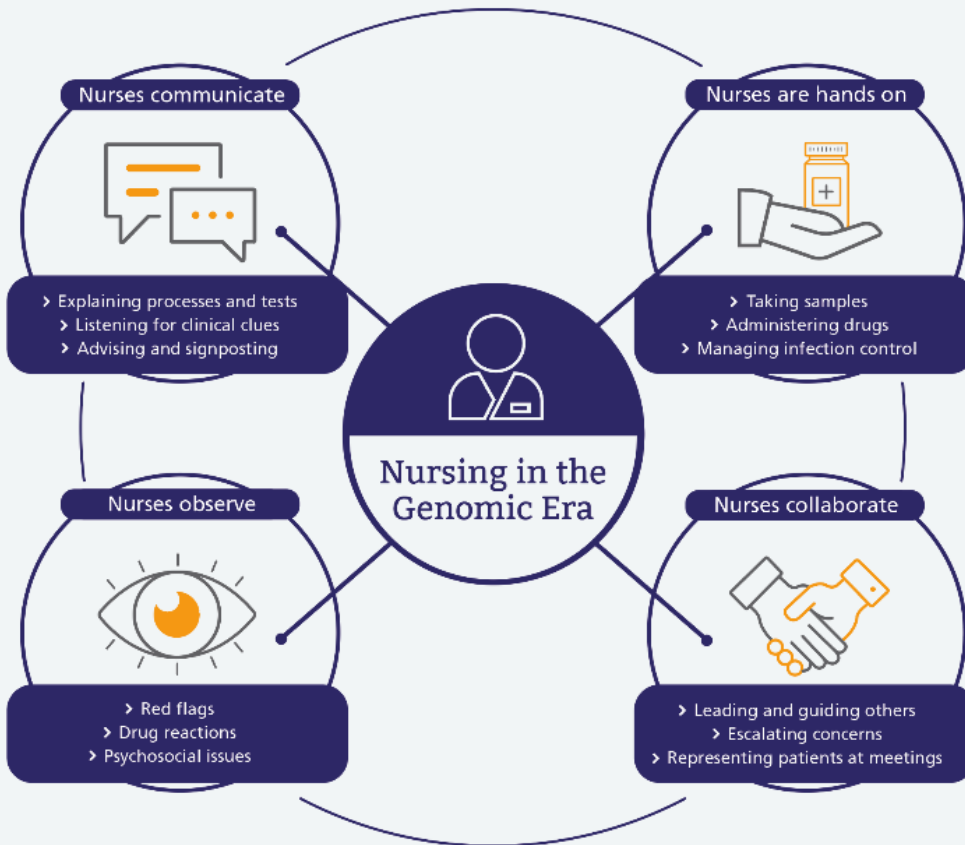
## **Consider genetic investigation for people with any the following:**

- suspected frontotemporal dementia
- dementia onset <55 years of age
- a family history compatible with a dementia-causing genetic variant
- clinical features suggestive of Down Syndrome (mosaic cases)
- clinical features compatible with rare single-gene forms of dementia

## **Develop local pathways for genetic investigation of dementia to ensure equitable access to appropriate genetic testing.**

- We recommend the establishment of multidisciplinary meetings that include clinical genetics and genetic counselling

# Nurses and Genomics



# Nursing and genomic medicine



**Finding the missing 95%:  
The Lynch syndrome diagnostic pathway to mainstreaming**

Laura Monje-Garcia, National Lynch Syndrome Project Lead Nurse, North Thames GMSA  
Tracie Miles, Associate Director of Nursing and Midwifery, South West GMSA  
Regional Lynch Syndrome Nurses

June 2023

**NHS 75**  
St George's University Hospitals  
NHS Foundation Trust

Neurogenetics Clinic is a nurse-led service with an aim to improve the diagnosis and health outcomes of patients with rare genetic neurological diseases, with a focus on young adults with complex epilepsies and neuromuscular disorders.



**Webinar for nurses and midwives:  
Familial Hypercholesterolemia**

Topics covered:

- 1) What is FH?
- 2) Voice of the patient with HEART UK
- 3) The role of nursing and midwifery



# Implementation and sustainability: MDT approach

## Key role of nurses in the Tower Hamlets Diagnostic Memory Clinic

- ✓ Pre-diagnostic counselling
- ✓ History + collateral information
- ✓ MSE + standardised cognitive assessment tool
- ✓ ECG + neuro examination
- ✓ Referral for **routine** investigations – blood tests, structural neuroimaging
- ✓ Referrals for **specialist** investigations – neuropsychology, functional OT assessment, functional neuroimaging, CSF biomarkers, genetic testing
- ✓ Clinical formulation with MDT
- ✓ Maintaining contact with patients and families/carers
- ✓ Post-diagnostic support

# CNS role in ELFT memory services

Funding – North Thames GMSA

Time - 1 day a week

Task – to work across East London NHS Foundation Trust dementia services

## TRAINING

- ⇒ Development & delivery of training
- ⇒ Link with genomic services
- ⇒ Network of genomic practitioners
- ⇒ Specialist placements for nursing students

## CLINICAL ROLE

- ⇒ Nurse-led clinic
- ⇒ Drawing family history
- ⇒ Consent
- ⇒ Ongoing support for patients & families
- ⇒ Point of contact

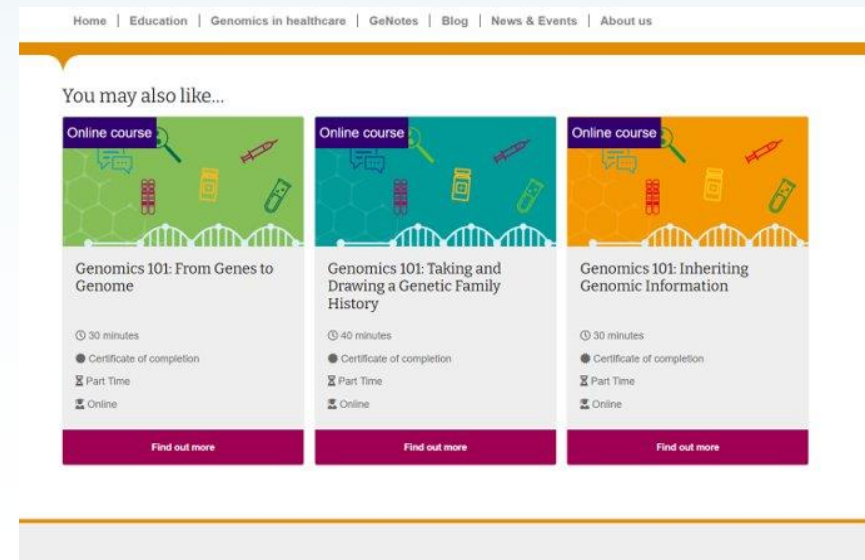
# Training with MDT teams

## Discussing genetics and genetic testing

- General conceptual understanding
- Disentangling patient choice from family motivation
- Explaining remit and process (diagnostic not predictive testing)
- Capacity/consent issues
- Implications for family/Involving family




## KNOWLEDGE

- ⇒ Genomics & genetics
- ⇒ Eligibility criteria for testing
- ⇒ Bespoke training



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You may also like...

Online course	Online course	Online course
		
Genomics 101: From Genes to Genome	Genomics 101: Taking and Drawing a Genetic Family History	Genomics 101: Inheriting Genomic Information
⌚ 30 minutes	⌚ 40 minutes	⌚ 30 minutes
● Certificate of completion	● Certificate of completion	● Certificate of completion
⌘ Part Time	⌘ Part Time	⌘ Part Time
🌐 Online	🌐 Online	🌐 Online
<a href="#">Find out more</a>	<a href="#">Find out more</a>	<a href="#">Find out more</a>

# Training with MDT team

## Obtaining an accurate family history

- General lack of information
- Concealed family history (early death of parent)
- Phenotypic spectrum (particularly FTD)

### SKILLS

- ⇒ Consent & capacity
- ⇒ Pre-diagnostic counselling
- ⇒ Taking family history

### Genetic pedigree symbols and lines


	Male	Female	Sex Unknown	
Individual				Marriage/partnership
Affected individual (symbol coloured in)				Divorce/separation
Multiple individuals				Where the partners are blood relatives (consanguineous relationship)
Deceased				Children/siblings
Pregnancy				
Miscarriage				Identical twins (monozygotic)
Person providing pedigree information				Non-identical twins (dizygotic)

# Training with MDT team

## Organising testing itself

- Forms
- Blood test
- Getting blood from arm to lab

NHS Genomic Medicine Service, WGS Test Request Rare Disease, August 2021, v1.2 to be used for WGS go-live. This document is subject to version control and is regularly updated. Please confirm you are using the current version by contacting your local Genomic Laboratory Hub

<b>Genomic Medicine Service</b>	<b>RARE AND INHERITED DISEASES</b>	
<b>Whole Genome Sequencing (WGS) Test Request</b>		
<b>PLEASE DO NOT USE FOR NON-WGS TESTS</b>		

<b>Requesting organisation:</b>
<b>GLH laboratory:</b>

Proband's first name		Life status <input type="checkbox"/> Alive <input type="checkbox"/> Deceased	Ethnicity
Proband's last name		Family test <input type="checkbox"/> Singleton <input type="checkbox"/> Trio <input type="checkbox"/> Other (provide number):	
Date of birth (dd/mm/yyyy)	Hospital number	Relevant clinical information <i>Please include any previous molecular testing with date(s) and any other pertinent clinical information</i>	
Gender <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Other	<small>Please state in clinical information box if karyotypic and/or phenotypic sex differ from given gender</small>		
Postcode	NHS number		



## Experience of testing over last 12 months: diagnostic accuracy

- 7 requests: 4 positive, 3 negative
- 9 pending
- 2 change of subtype diagnosis AD -> FTD, and FTD -> AD
- 2 families requested referral to GMS
- Same variants in Bangladeshi and Somali ancestry

## Can genetic testing accelerate diagnosis?

- Recent onset of symptoms
- Strong family history of dementia
- symptomatic MCI level
- Genetic testing as part of standard memory clinic ax...
- Has capacity, can make informed decision
- Can hold the information and discuss with wider family

## QI project

- Quality improvement methodology
- Measure the impact of awareness raising and training

## Thank you

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