

***This house believes that ALL
cardiologists should be ordering
ALL genetic tests-Con***

***Dr Sarju Mehta
Consultant in Clinical Genetics***

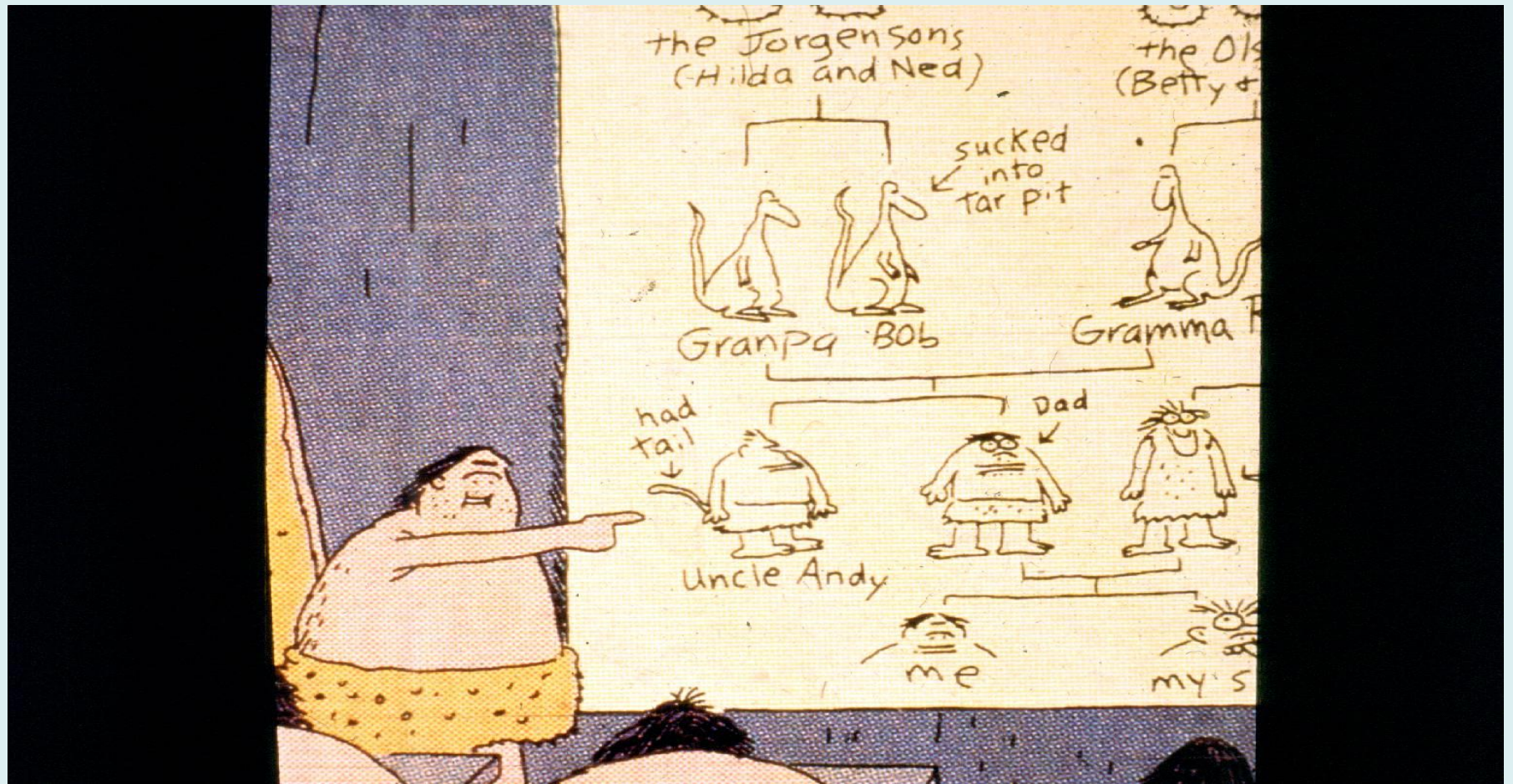
Disclaimers

- I get paid to order genetic tests

Overview

- Why is genetic testing different
- Genetic advances
- Education and training
- Infrastructure requirements

Why is Genetic testing different?



Dirk brings his family history to class

Sharing of information



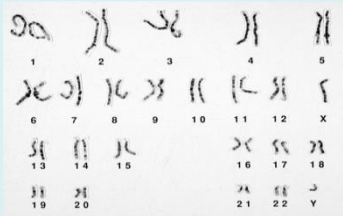
Informed Consent



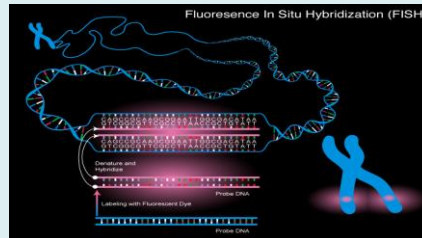
Cytogenetic Advances



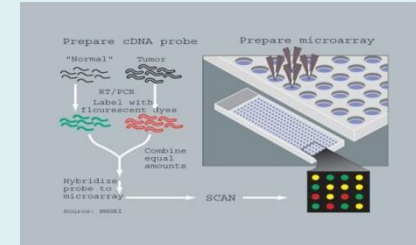
KARYOTYPE



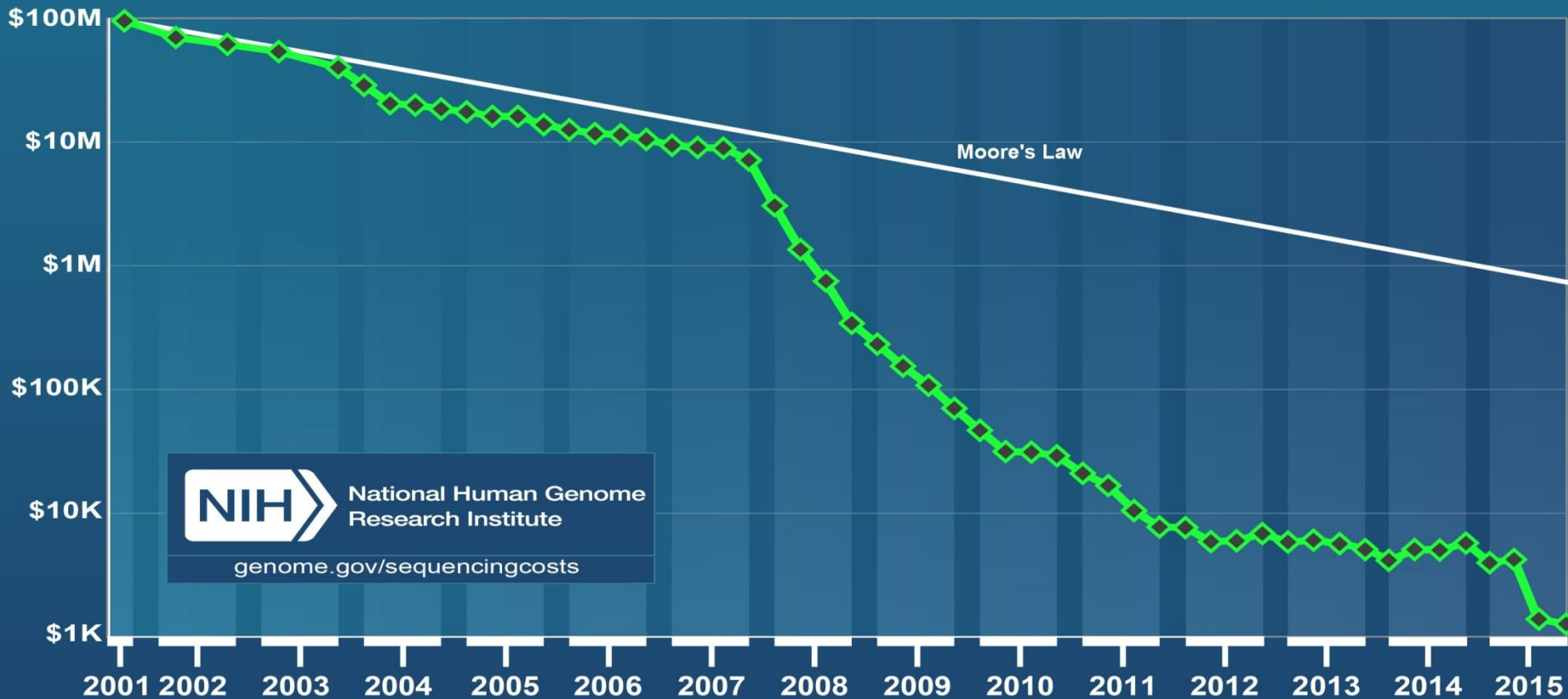
FISH



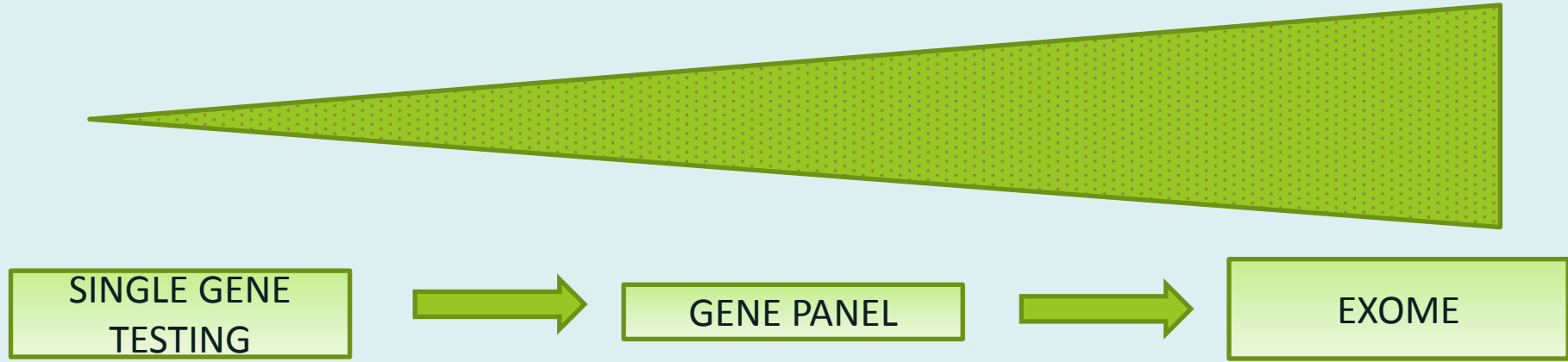
MICROARRAY



Cost per Genome



Molecular genetic advances

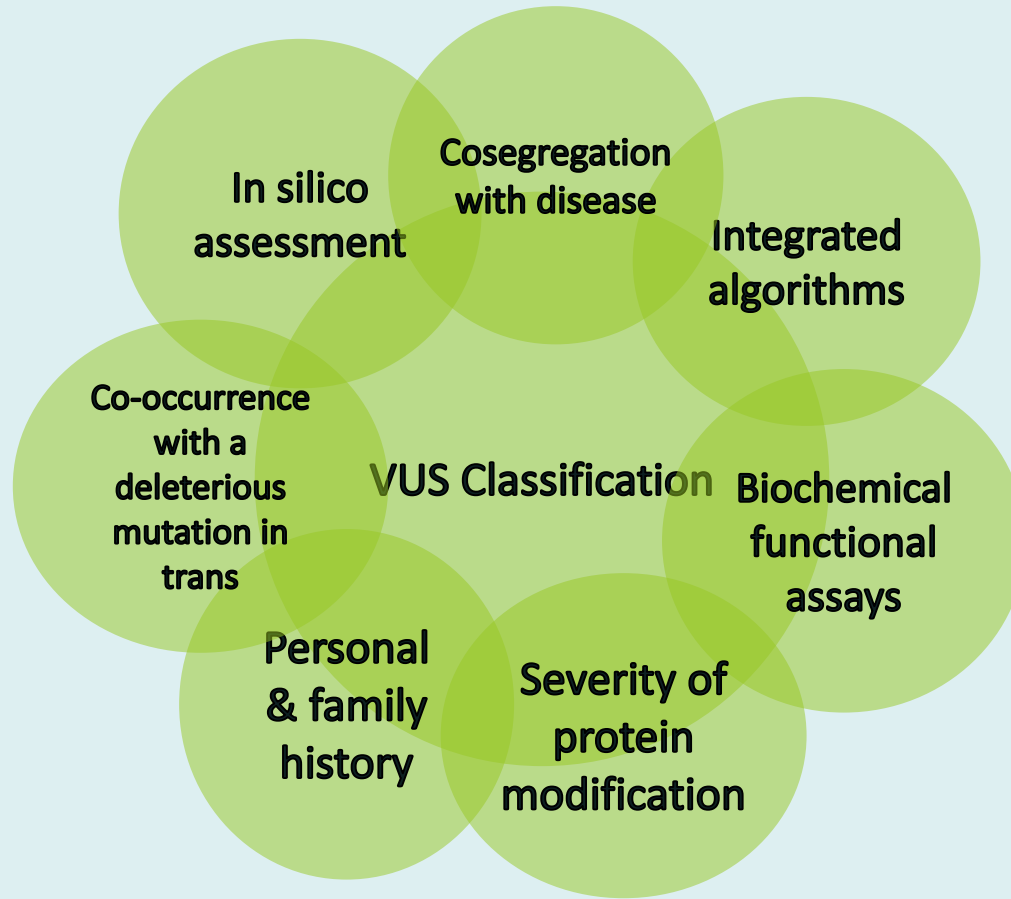


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Open

Reassessment of Mendelian gene pathogenicity using 7,855 cardiomyopathy cases and 60,706 reference samples

Roddy Walsh, BSc, MSc^{1,2}, Kate L. Thomson, BSc, FRCPATH^{3,4}, James S. Ware, PhD, MRCP^{1,2,5},
Birgit H. Funke, PhD, FACMG^{6,7}, Jessica Woodley, BSc³, Karen J. McGuire, BSc³,
Francesco Mazzarotto, BSc, MSc^{1,2}, Edward Blair, BMSc, MRCP⁸, Anneke Seller, PhD³, Jenny C. Taylor, PhD^{9,10},
Eric V. Minikel, MS^{11–14}, Exome Aggregation Consortium¹⁴, Daniel G. MacArthur, PhD^{11,12,14,15},
Martin Farrall, FRCPATH^{4,10}, Stuart A. Cook, PhD, MRCPATH^{2,5,16,17} and Hugh Watkins, MD, PhD^{4,10}



Atlas of Cardiac Genetic Variation

The genetics of cardiomyopathy has become increasingly heterogeneous and complex in recent years, with ever more genes and variants associated with each condition. However, as our understanding of the level of rare variation in the general population has grown, it has become clear that many of these associations are not robust and may in fact represent benign, background variation unconnected to disease. The **Atlas of Cardiac Genetic Variation** utilises two substantial resources of genetic data - population data from the [Exome Aggregation Consortium \(ExAC\)](#) and clinical data from the Oxford Molecular Genetics Laboratory (OMGL) and the Laboratory of Molecular Medicine (LMM) - to clarify the genetics of cardiomyopathies and inform clinical decision making. Clinical geneticists and researchers can explore the overall genetic architecture of HCM, DCM or ARVC, examine the role of specific genes or check the status of individual variants identified in cardiomyopathy patients to assess the likelihood of pathogenicity. This resource was produced in conjunction with the following publication:

Reassessment of Mendelian gene pathogenicity using 7,855 cardiomyopathy cases and 60,706 reference samples.

Roddy Walsh, Kate L. Thomson, James S. Ware, Birgit H. Funke, Jessica Woodley, Karen J. McGuire, Francesco Mazzarotto, Edward Blair, Anneke Seller, Jenny C. Taylor, Eric V. Minikel, Exome Aggregation Consortium, Daniel G. MacArthur, Martin Farrall, Stuart A. Cook and Hugh Watkins. *Genet. Med.* 2016 doi:10.1038/gim.2016.90.

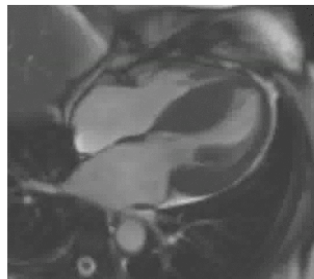
Explore by variant

Select a gene and enter a variant (HGVS format, e.g. c.1234A>T) in the form below to assess frequency in population databases (ExAC, ESP, 1000 Genomes), detection and classification by OMGL and LMM clinical labs, and the likelihood of pathogenicity for the variant in relevant cardiomyopathies.

Variant Search - Gene: Variant:

Explore by disease & gene

Hypertrophic Cardiomyopathy - HCM



MYBPC3 - MYH7 - TNNI3 - TNNT2 - TPM1 - MYL2
FHL1 - MYL3 - GLA - PRKAG2 - NEXN - ACTC1
LAMP2 - PLN

Dilated Cardiomyopathy - DCM



TTN - DSP - MYH7 - LMNA - TNNT2 - TPM1 - VCL
TCAP - LDB3 - MYBPC3 - ABCC9 - DES - TNNI3
ACTC1 - SGCD - PLN - TAZ

Arrhythmogenic right ventricular cardiomyopathy - ARVC



PKP2 - DSP - DSG2 - DSC2

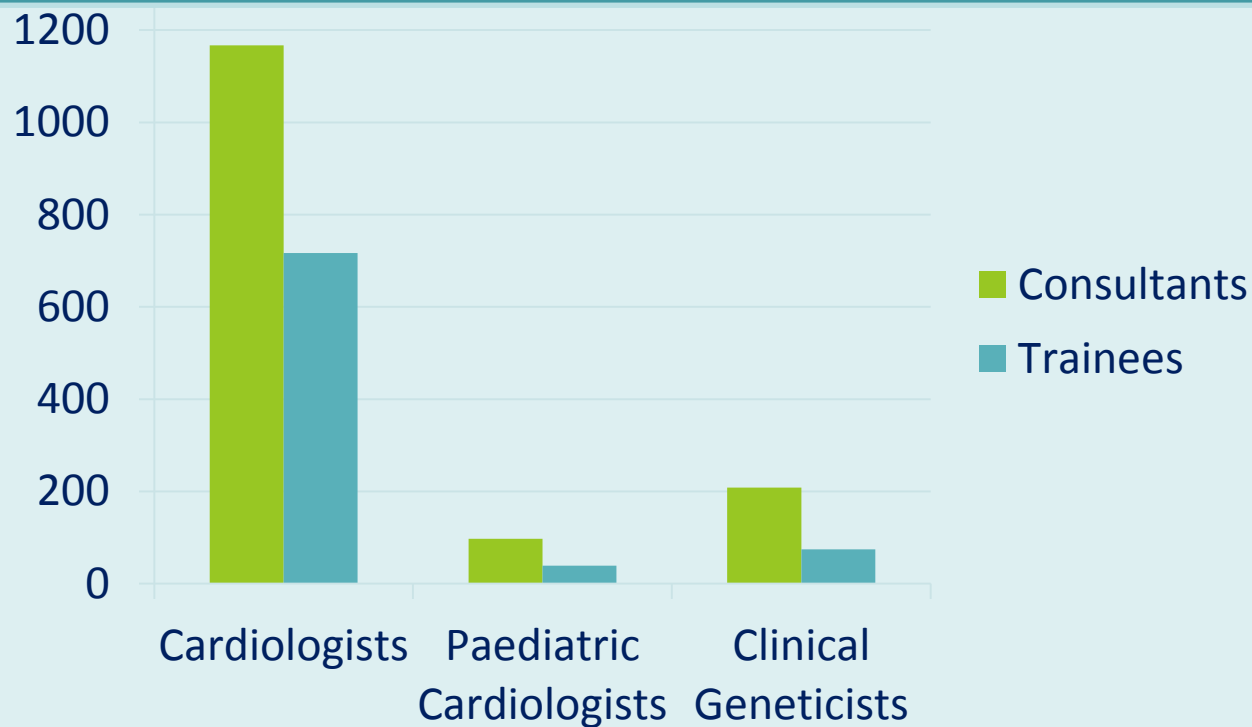


Predictive Genetic Testing





RCP census 2014-15



Education and Training



EUROPEAN
SOCIETY OF
CARDIOLOGY®

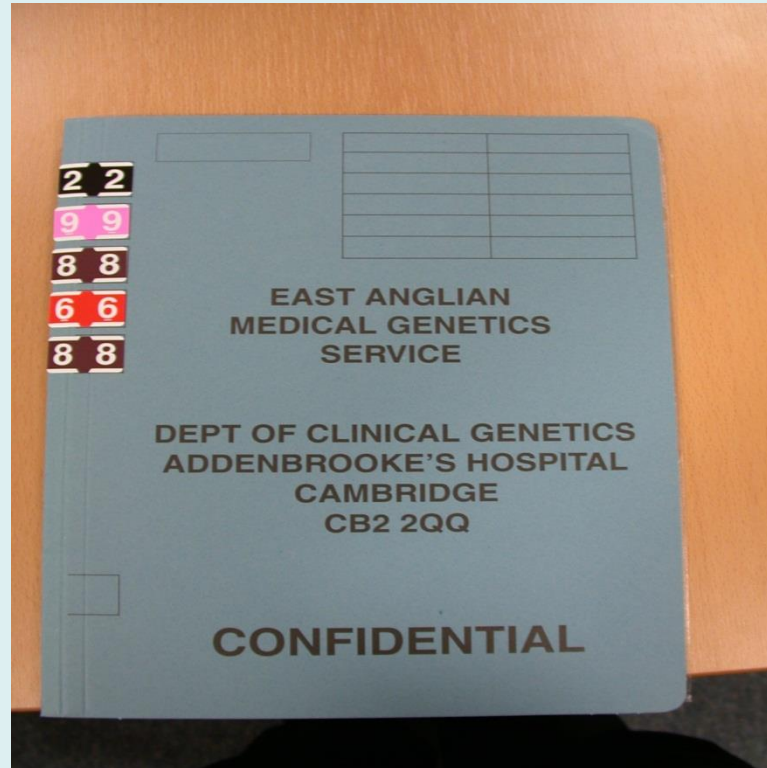
European Heart Journal (2013) **34**, 2381–2411
doi:10.1093/eurheartj/ehs234

CURRENT OPINION

ESC Core Curriculum for the General Cardiologist (2013)

European Society of Cardiology

Hospital Infrastructure



Hospital Infrastructure

The screenshot displays the 'Media Manager - Orders Only on 15/04/2015 with TAYLOR, Amy, Counsellor' window. The left sidebar contains navigation options: Chart Review, Orders Only (selected), Communications, Orders for Admin..., Sign Visit, FYI, Media Manager, Demographics, Flowsheets, Care Teams, and Patient Chart Ad... The main area shows a table with columns: Document ID, Internal ID, Description, Document Type, and File Attachment. A single row is visible with details for document Z9999999_BOADICEA report.pdf.

An 'Edit File Information' dialog box is open, featuring several sections:

- Attach File To:** Buttons for Patient, Enc..., and Order... Below this, a yellow bar displays 'Patient: TEST_TestTest [123456]' and 'Encounter: Orders Only on 15/04/2015 with TAYLOR, Amy, Counsellor'.
- Document Information:** Fields for Description (Z9999999_BOADICEA report.pdf), Doc type (Study Attachment for Report), Effective date, Expires date, Service on date, Received date, Received by (TAYLOR, AMY), Status, Group, and Location.
- Signature:** Fields for Signed by, Signed date, Relationship, Representative, Witnesses (with a table for Name and a value of 1), and Comments.
- Send Import Notification To:** Recipient and Modifier fields, with buttons for Add GP, Add My List, Build My Lists, and Clear All.
- Result Information:** A section indicating it is not supported from Visit Navigator, with checkboxes for Modify result and Send message, and fields for Date, Abnormal status, Status, and Billing consultant.

At the bottom of the dialog are buttons for View/Play, Preview pane, Accept, and Cancel.

Patient information

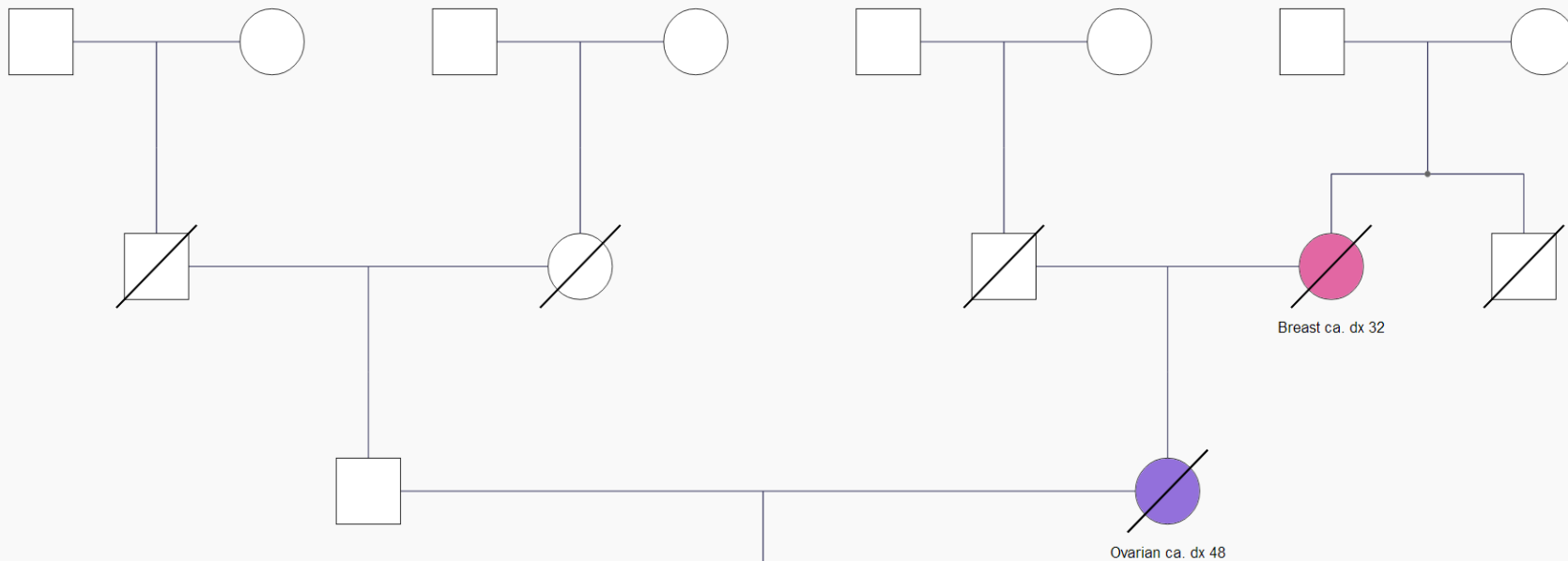
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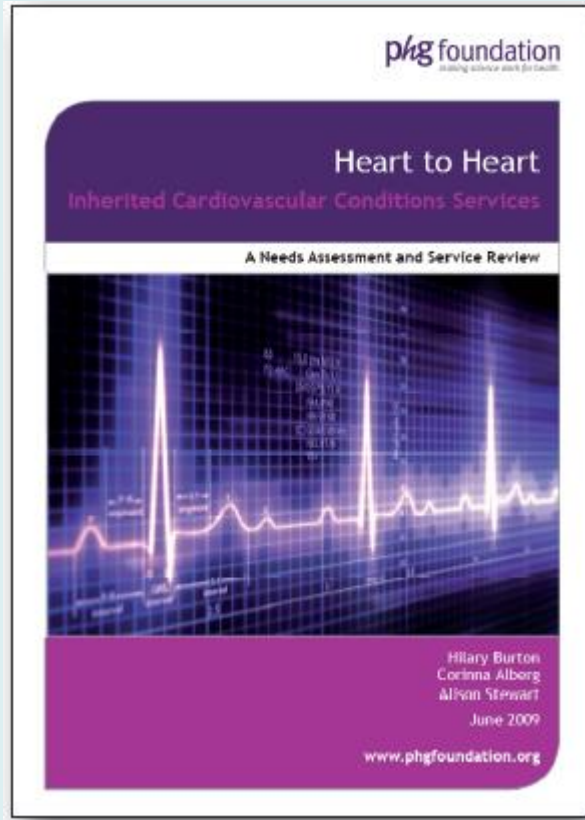
TT test

Family history and pedigree

PEDIGREE

[EDIT PEDIGREE](#)





Every UK cardiac network should ensure that its population has access to specialised expert ICC services for children and adults, although most will not have their own service.

***This house believes that ALL
cardiologists should be ordering
ALL genetic tests***

***This house believes that SOME
cardiologists should be ordering
SOME genetic tests***

Questions?