**Saint Mary’s Hospital**

**Manchester Centre for Genomic Medicine**

**Information for Ophthalmologists**

**FAQ: Genomic eye panel tests for Ophthalmologists**

**Can I order a genetic (genomic) test or should I refer a patient?**

* Genomic testing for a range of inherited eye diseases is available from NHS Genomic Laboratory Hubs. For information about the current eye panel tests available in Manchester, please visit the website: [www.mangen.co.uk](http://www.mangen.co.uk). Ophthalmologists with experience and expertise in diagnosing inherited eye conditions can collect a blood sample and order a genomic eye panel test.
* For information around consent and the competency framework for genomic testing, please visit: <https://www.genomicseducation.hee.nhs.uk/news/new-competency-framework-for-genomic-testing/>
* The National Genomic Test Directory has further detailed information and contains criteria for ordering tests: https://www.england.nhs.uk/publication/national-genomic-test-directories/

**When is it appropriate for an ophthalmologist to order a genetic test?**

* A diagnostic genetic test is appropriate for patients with symptoms or features of a genetic eye condition, where a precise genetic diagnosis may help with management and/or to provide information for the patient and/or their family.
* In some cases, unaffected family members may need testing such as for “segregation” studies (further information below).

**When is it not appropriate to order a genetic test?**

* Predictive testing is testing an asymptomatic individual for a variant that has been identified in the family. Predictive testing should only be offered following genetic counselling as it can have a significant impact on individuals and their families.
* Couples requesting carrier testing for reproductive decision making may also benefit from genetic counselling and should be referred to genetics.
* Patients with syndromic eye disease may benefit from referral to clinical genetics prior to genetic testing. Full understanding of the patient’s phenotype and the most relevant genomic investigations can be undertaken by a clinical geneticist.

**When should I refer for genetic counselling?**

* Genetic counselling is beneficial in a range of scenarios, examples include when an individual:
	+ Is asking questions about carrier testing for reproductive choices.
	+ Would like predictive testing.
	+ Requires information about inheritance patterns, risks to family members and support in communicating information to family members about risks of inherited eye disease.

**What is the cost of testing and how long does it take?**

* For costs and timeframes for the various tests please see <https://www.mangen.co.uk/healthcare-professionals/manchester-genetic-diagnostic-laboratory/ophthalmological-genetics/>

**How can I arrange a genetic test?**

* A consent form should be completed by the patient (or guardian) each time a test is ordered. See [www.mangen.co.uk](http://www.mangen.co.uk) for this form.
* For each test, the genetic lab require a completed genetic test referral form which can be found at <https://www.mangen.co.uk/wp-content/uploads/2020/04/Referral-form-Manchester-v8.pdf> along with a blood sample collected in an EDTA bottle. This needs to be sent by first class post.
* It is possible for a GP to take blood samples if not possible/appropriate to do in clinic. In this case, clearly state details of the test required on the genetic test request form and ask the patient to take the test request form to their GP to arrange the blood sample.

**What should I include on the genetic test request form?**

* Full clinical information including relevant symptoms, examination findings, family history and non- ocular features.
* Complete the tick box indicating whether the request is for a diagnostic test, carrier test or predictive test.
* If a family member is already known to the genetic department, write their name and DOB and the causative gene variant if known. Full panel genetic testing typically is not necessary when a cause in the family is known and a control sample available.

**What are the possible results?**

* Causative variant(s) identified
* No variant(s) identified
* Variant(s) of uncertain significance (VUS) identified

**What are Variant of Uncertain Significance (VUS) results?**

A VUS is a variant in the gene that cannot be classified as benign, but has insufficient evidence to know that it is pathogenic. VUS results can be discussed in a specialist genomic MDT to understand phenotyping, evidence and research that may help with interpretation. Segregation may be helpful (see below).

**What may be unexpected results?**

* Testing could reveal a syndromic cause for the eyesight problems. This possibility needs to be discussed carefully with the individual/guardian as part of the consenting process as there could be unexpected implications with this result. Referral may be needed to Clinical Genetics.
* Additional carrier findings may be identified and will be reported if the referral indicated consanguinity.

**When should I test other family members?**

1. **Testing other affected family members**
* If other family members have already been tested, it is important to inform the lab so that direct testing for the familial variant can be offered. Testing for specific family variants is cheaper, quicker and more efficient than ordering a full panel of genes.
1. **Segregation studies**
* When two different variants are found in a recessive gene and the family history is consistent for recessive inheritance, it is useful to confirm if the variants are on opposite copies of the gene. The most straightforward way to do this is to test the parents of the index patient for the specific variants found.
* A patient information leaflet for segregation studies is available at [www.mangen.co.uk](http://www.mangen.co.uk)
* If the parents of the index patient are unavailable for testing, testing of adult offspring of the index patient may be considered. Testing siblings of the index patient for segregation studies should not be performed as less likely to be informative and potentially risks performing a predictive test without appropriate counselling.
1. **Predictive/carrier testing**
* Predictive testing is testing an unaffected person for a genetic condition to find out if they may develop the condition themselves or be at risk of having an affected child.
* Carrier testing can help couples understand their chances of having children who could be affected.
* Both situations require referral to clinical genetics to be seen by a genetic counsellor. Details of their condition and genetics result should be included in the referral.

There is also an option to discuss your cases at the monthly genetic ophthalmic MDT. For further information contact Stuart Ingram at Stuart.Ingram@mft.nhs.uk