Indications for postnatal cytogenetic testing

Rapid neonatal aneuploidy screening and sex determination by FISH
Rapid neonatal screening by FISH for trisomy 13, 18 and 21 and for sex determination can be undertaken if results are needed urgently. Reports will be faxed, usually within 24-48 hours. This is not equivalent to a full chromosome analysis and is always followed by a full karyotype.

Karyotyping

- Ambiguous genitalia/indeterminate gender
- Delayed puberty or inappropriate secondary sexual development
- Short stature, amenorrhoea in females
- Oligospermia or azoospermia in males
- Parental karyotyping after pregnancy loss of an unkaryotyped fetus with multiple congenital abnormalities or severe IUGR
- Family history of a known chromosome abnormality other than simple aneuploidy due to non-disjunction (normally only first degree relatives)
- Suspected family history of chromosome abnormality where the karyotype of the affected individual is not known
- Sperm and egg donors for NHS funded patients
- Microdeletion/duplication syndromes (includes FISH testing if probes are available and if diagnosis by molecular genetic methods is not possible)
- Chromosome breakage syndromes: ataxia telangiectasia, Bloom syndrome, Fanconi anaemia and Nijmegan breakage syndrome

If a patient falls outside these referral categories, please contact Lee Grimsley or Lucy Platts, Cytogenetic Team Leaders, to discuss the test required before sending a sample.

Please note:

Parental karyotyping is NOT appropriate in the case of:

- family history of aneuploidy arising from non-disjunction
- previous pregnancy with aneuploidy arising from non-disjunction

Please note that parental karyotyping after three or more unexplained miscarriages is no longer funded by the London Specialist Genetics Commissioners. Please see ‘Indications for cytogenetic testing after pregnancy loss’ for further information on appropriate tests.

Genome-wide microarray screening

- Unexplained learning difficulties/developmental delay/behavioural problems (including autism and Fragile X) and/or:
- Dysmorphism/multiple congenital abnormalities suggestive of a chromosome abnormality - this will include some patients suspected of having Prader-Willi syndrome, Angelman syndrome, or other microdeletion syndromes.

Fragile X syndrome or other single gene disorders require specific molecular tests for mutations in the first instance are not detected by microarray. These tests are performed by the Molecular Genetics Laboratory; samples should be sent directly to them.

Please note

Genome-wide microarray is a test for patients with suspected genomic imbalance who fall into one or both of the two categories set out below. Samples may be referred by any clinician covered by our commissioning arrangements, provided they meet the referral criteria and will be tested provided that the correct sample is received. Other samples will be accepted if a source of funding is identified.

If microarray testing is requested but it is inappropriate (as judged by referral criteria) or no clinical information is supplied and a Lithium Heparin sample is received a karyotype will be performed a report issued advising why microarray was not performed.

If a microarray test has not been requested but is judged to be appropriate then in certain circumstances it may be appropriate to perform this test. In these circumstances a microarray test can only be performed on receipt of written consent and you will be asked to provide this in the form of an email, fax or letter or a new referral form requesting microarray testing.

If you have any queries regarding the suitability of this test, please contact the Molecular Cytogenetics Section Head, Rodger Palmer to discuss the test required before sending a sample.

Microdeletion / microduplication testing

See genome-wide microarray screening

Testing for Prader-Willi syndrome and Angelman syndrome are performed by the Molecular Genetics Laboratory; samples should be sent directly to them.

Telomere screening

Telomere screening is a specialist test for patients with a family history suggesting segregation of a reciprocal translocation (i.e. 2 distinct phenotypes segregating within a family). Samples should be referred by a Clinical Geneticist.

Chromosome breakage syndromes

Specialist testing for chromosome breakage syndromes (ataxia telangiectasia, Bloom syndrome, Fanconi anaemia and Nijmegen breakage syndrome) is performed out-of-house in a referral laboratory. In order to ensure that the correct test is performed, it is essential to specify which diagnosis is indicated.

Testing for tissue specific mosaicism on skin biopsy

Karyotyping of skin biopsy from a live patient is usually performed to investigate the possibility of tissue-specific chromosomal mosaicism. This should only be undertaken once a karyotype has been obtained on a blood sample. Patients for skin biopsy should be referred through the Clinical Genetics Unit.

Single gene disorders (including fragile X syndrome)

Testing for single gene disorders such as cystic fibrosis, sickle cell anaemia, fragile X syndrome, Duchenne muscular dystrophy, Prader-Willi syndrome, Angelman syndrome etc are performed by the Molecular Genetics Laboratory; samples should be sent directly to them.