

**NATIONAL EXTERNAL QUALITY
ASSESSMENT SCHEME
IN
CLINICAL CYTOGENETICS**

ANNUAL REPORT

2010

UK NEQAS for Clinical Cytogenetics

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Steering Committee

Dr Lorraine Gaunt (Chair, Manchester)
Mr Eddy Maher (Deputy S.O, Edinburgh)
Mrs Sandra Birdsall (Cardiff.)
Mrs Carolyn Campbell (Oxford)
Dr Sheila O'Connor (Leeds)
Prof Andrew Green (Dublin)
Mr Nick Bown (Newcastle)
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Dr Ros Hastings (S.O, Oxford, JR)
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Mrs Helen Dickinson (Leeds) **
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Mr Roger Mountford (NQAAP, Liverpool)
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* Ended their term in office December 2010 ** Ended their term in office October 2010

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1. Introduction to the Scheme

The National External Quality Assessment Scheme (NEQAS) for Clinical Cytogenetics has been a member of the UK NEQAS Consortium since 1983. The Scheme is accredited to the new CPA guidelines (ILAC 43). The Scheme has been accredited with CPA (UK) Ltd since July 2007. The Scheme had a full accreditation inspection in November 2010 and has retained its accredited status.

The annual management review for the 2010 EQA seasons was completed in January 2011, reviewed by the Steering Committee and sent to the CPA office. Quality objectives for 2011 have been set and are available on request.

For further information about the Clinical Cytogenetics Scheme please contact the Scheme Organiser (ros.hastings@orh.nhs.uk) or visit the Scheme web site at www.cneqas.org.uk or via the UK NEQAS web site, www.ukneqas.org.uk

2. External Quality Assessment (EQA) distributions in 2010

The EQA assessments consider **technical**, **analytical** and **interpretive performance**. All EQAs offered in 2010 were fully interpretative EQAs

- Technical proficiency tested via submitted slides, DNA samples and cell suspensions;
- Analytical proficiency tested via validated cell suspensions, DNA and online EQA;
- Interpretive proficiency is assessed for all EQAs and specifically tested via case scenarios and retrospective external audit of reports on work undertaken in diagnostic laboratories.

2.1 Constitutional Scheme

In 2010 there was a single distribution for each of the following EQAs -

- Amniotic fluid (slide distribution)
- CVS (retrospective)
- Blood (online)
- Urgent Blood (case scenario)
- Molecular Rapid Aneuploidy (MRA) (DNA distribution)
- Fanconi Anaemia (online)

2.2 Haematological Scheme

In 2010 there was a single distribution for each of the following EQAs -

- CML (online)
- AML (slide distribution)
- ALL (retrospective)
- Tumour (case scenario)
- LPD (online/cell suspension)

2.3 Pilot EQA Schemes

- Microarray/Array CGH (DNA distribution)

The online Microarray pilot involved the analysis of a single DNA sample (one case). 42 laboratories registered for the pilot and 40 participated.

3. Scheme participation

In 2010, 101 laboratories participated in the scheme; 43 UK laboratories, and 58 non-UK cytogenetic laboratories. As well as UK cytogenetic laboratories, some haematology and histopathology laboratories participate in either the LPD EQA or the Tumour EQA. A total of 691 EQA distributions were sent out by the Scheme Office. UK cytogenetic laboratories generally participate in more EQAs than non-UK laboratories (ratio approx 3:2).

4. Scheme submissions

- 5 laboratories failed to remove their laboratory identification on the reports or referral cards this year. This is more than in previous years and was not limited to new participants.
- The reporting format and style are not marked but may be commented upon. Clerical errors are not penalised. The full score for interpretation and reporting is 2 marks
- For non-UK labs:- Interpretation of a cytogenetic result is an essential part of the diagnostic report. Laboratories must submit an interpretation with the report. If the interpretation of cases in your department is routinely done by a Clinician or Clinical Geneticist, please (a) involve them when completing the case online and (b) submit a copy of the Clinician's or Clinical Geneticist's letter with the retrospective reports.
- UK NEQAS for Clinical Cytogenetics does not determine the Professional Guidelines. The ACC Professional Standards Committee (UK), CPA UK Ltd and other European or International bodies (e.g. ECA, ISO standards, ISCN, leukaemia trial studies) produce the guidelines and standards. UK NEQAS for Clinical Cytogenetics has referred issues arising out of the EQA rounds to the ACC Professional Standards Committee and the ISCN Committee in the past and will continue to approach the professional organisations if additional guidance/clarification is required
- UK NEQAS marks the laboratory submissions against its interpretation of these guidelines/standards. If you have issues in the way the guidelines/standards have been interpreted by UK NEQAS please submit them to the Scheme Office through the appeals process.

4.1 ISCN 2009

- Laboratories were expected to use ISCN 2009 in all their reports after April 2010.

4.2 Interpretation and reporting

Several EQAs raised issues which are reproduced here for participants' information
Constitutional:

- No cross reference to the preliminary report in the final cytogenetic report.
- The term 'abnormal' is not encouraged when describing an apparently balanced rearrangement.
- It is important to relate the karyotype to the referral reason e.g. abnormal ultrasound findings.
- It is important to give an assessment of recurrence risk or mention whether prenatal diagnosis is appropriate in future pregnancies. A few laboratories use the HC Forum website but the figures given on this website may be inaccurate. Some laboratories gave a risk to one or two decimal places which implies a level of precision that does not exist.
- It is important to refer the patient for genetic counselling when appropriate.
- MRA: When reporting an abnormal result it is important to specify which markers are informative. Laboratories predominantly gave both the informative chromosome band location as well as the marker/probe name which identifies the extent of the trisomic region, which is helpful to the clinician. Professional Guidelines currently do not require the markers be given for monosomy results. However, assessors considered that as the quantitative X chromosome markers are fully informative for copy number the name/location of these markers should be given.

Acquired:

- There is an error in ISCN 2009 page 109, *i.e. der(9)t(9;22)del(9)(q34q34)*– the ISCN should be *der(9)del(9)(q34q34)t(9;22)* (personal communication from one of the ISCN editors, Lynda Campbell).
- ISCN is written from pter to qter taking into account the frame order (personal communication from ISCN committee). Most genes will be written 5' proximal to 3' but there are several genes e.g. *SS18* where 3' is proximal to the 5'.
- It is recommended that HUGO gene names are used in the ISCN and written report e.g. *ABL1*, *ETV6-RUNX1*. When there is fusion or rearrangement the genes can be written as *IGH-CCND1*

(i.e. use a – sign rather than a /) to distinguish the fusion product from a mixed probe kit (WHO 2008).

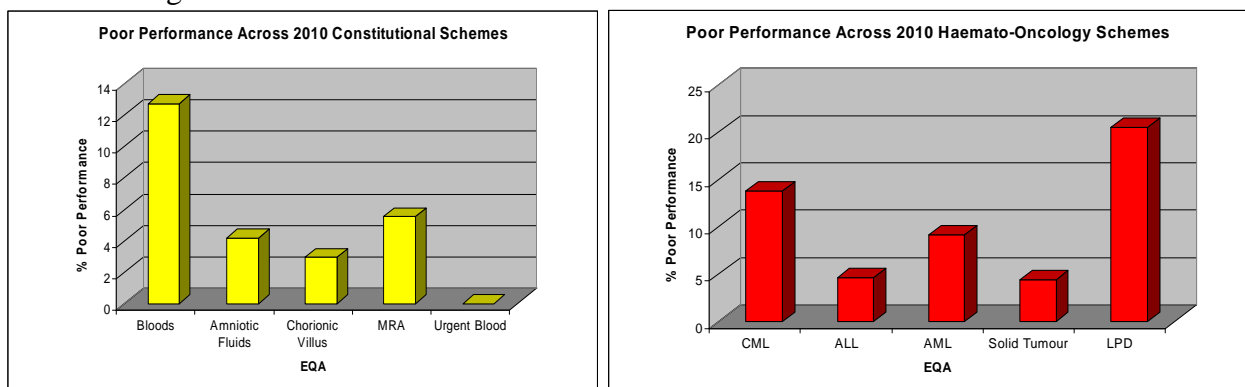
- A few reports separately interpreted each chromosome abnormality in relation to the disease. It is important to address the clinical question and prognostic significance of the karyotype as a whole.
- Cell numbers: Percentages in the absence of an overall total are inadequate. This information is important to establish the robustness of the results.
- Some labs write extremely long reports where exhaustive descriptions of the abnormalities detected often make it difficult to pick out the salient points.
- AML: If a normal chromosome result is found, then an intermediate prognosis can be given only if an AML diagnosis is confirmed. Some laboratories qualified their reports by mentioning that the intermediate prognosis of normal AML cases was influenced by molecular abnormalities rather than just cytogenetics.

5. EQA structure and format

- Details of all EQAs and times of submissions are available once you log in online. In addition, the EQA timetable is available to download under EQA on the static website.
- All EQAs involve submission of documentation or analysis online. In addition, the slide distribution EQAs required laboratories to submit slides via the post; MRA and Micorarray/Array CGH EQAs involved analysis of DNA samples; the LPD EQA involved an online case plus FISH analysis of a cell suspension sample.
- All EQA summary letters include the range of actual scores, so laboratories can see how their performance compares with other laboratories. The standard that should be obtained is ‘satisfactory’.
- UK laboratories receiving additional EQA rounds following an unsatisfactory performance will be charged an additional fee of £100 to cover the increased administration costs (Laboratories were not charged in 2010). Non-UK laboratories will be notified by letter of any unsatisfactory performance.
- Laboratories have 15 working days to appeal against any penalties/comments in their individual laboratory reports.

6. Performance scoring

In accordance with the performance criteria, the standard for all laboratories to reach is “satisfactory” (CPA (EQA) Standards E5 and F5). The laboratories’ performance scores (after completion of the appeals process) for the 2010 constitutional and haematology-oncology EQA schemes are given below.



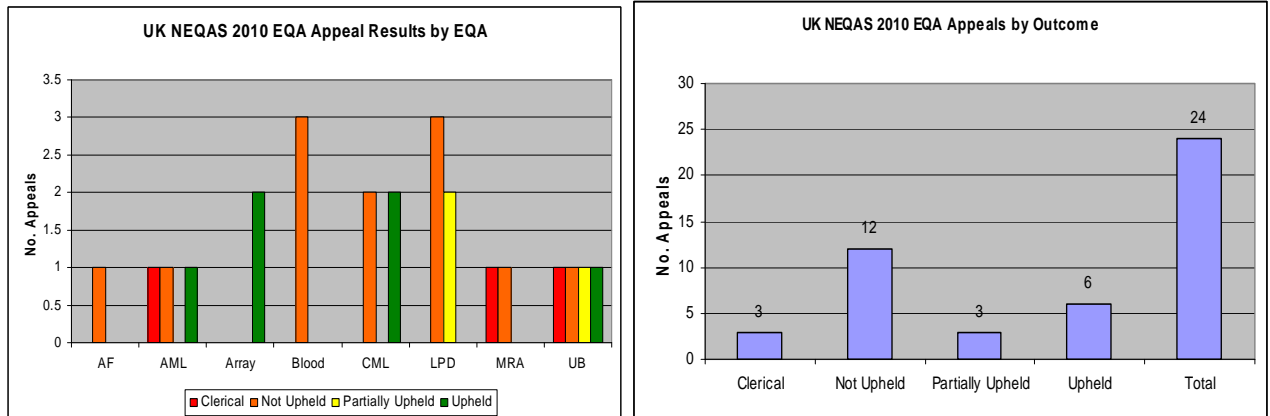
6.1 Consistency across the Scheme

The Scheme tries to be consistent between EQA schemes and across both constitutional and haematology-oncology areas but inconsistencies sometimes occur (see slight differences in the marking in the constitutional and haematology-oncology cytogenetics performance criteria). In 2010 the steering committee established a formal way to agree the marking criteria.

In addition, joint EQAs may sometimes identify inconsistencies in reporting, for example Molecular Rapid Aneuploidy results between Cytogenetic departments and Molecular Genetic departments.

6.2 Appeals

The performance criteria (v4.6 & 4.5) were used to assess all the EQA rounds and pilots this year. There were 24 appeals to the Scheme, of which 6 were fully upheld (had the appealed penalties rescinded), 3 were partially upheld (had some but not all the appealed penalties rescinded) and 12 appeals were not upheld. The remaining 3 appeals were due to clerical errors that were rectified. See below for details.



6.3 Poor performance

A zero mark in the analytical or interpretative score will automatically result in poor performance (see Performance Criteria). Since Autumn 2007, non-UK laboratories with a poor performance are requested to review their reporting policy and no obligatory additional EQA rounds are sent.

A total of 26 different laboratories received a poor performance in the 2010 EQAs, of which five non-UK laboratories failed to participate in the EQAs for which they had registered.

6.4 Persistent poor performance

Two UK based labs and one non-UK lab received a persistent poor performance categorisation (three poor performances within a rolling three year period or poor performance in the additional EQA rounds) for the first time in 2010; in addition three non-UK laboratories continued to receive persistent poor performance. The two UK laboratories have been referred to NQAAP.

7. Scheme personnel

- **Scheme Organiser:** Dr Ros Hastings was appointed in June 2003.
- **Deputy Scheme Organiser:** Mr Eddy Maher was appointed in November 2003.
- **Quality Manager:** Bettina Quellhorst-Pawley was appointed in October 2005. Bettina is also the CEQA (European Cytogenetics EQA) QM/administrator.
- **Steering Committee:** Dr Lorraine Gaunt was appointed in December 2009
- **Steering Committee Executive:** Consists of the Chair, Scheme Organiser, Deputy Scheme Organiser, Secretary and a senior cytogeneticist specialising in haematology-oncology (Nick Bown) from the Steering Committee.

7.1 Assessors –

The Scheme is keen to recruit new assessors for 2012, as some assessors are completing their term of office in 2011. UK assessors will normally have part 1 of the FRCPATH and will be

regularly involved in reporting. Non-UK assessors are normally recognised experts with a minimum of 10 years experience in their specialist area. Potential assessors need to send a brief curriculum vitae to the Scheme Office (ros.hastings@orh.nhs.uk) in the first instance. All assessor appointments will be ratified by the Steering Committee.

There were 7 non-UK and 26 UK assessors (including the MRA assessors but excluding the Scheme Organiser).

The following assessors completed their term of office or resigned in 2010.

- Mr Mike Griffiths
- Mr Paul Roberts
- Dr Bjorn Menten
- Mrs Helen Dickinson
- Dr Fiona Ross
- Dr Carol English

The Scheme is very grateful for the time, support and commitment given by these individuals and their laboratories over the last 4 to 8 years.

In 2011 the following assessors will join the Scheme

- Mrs Nicola Foot
- Mrs Caroline Devlin
- Ms Amy Logan

8. Changes to the Scheme for 2011

In order to simplify the EQA process and to reduce the workload for participating laboratories, The Scheme has decided to discontinue the slide distribution EQA and merged two Haematology-Oncology Schemes. The Blood EQA will now also include urgent referrals. The following Schemes are offered in 2011.

8.1 Constitutional Scheme –

- Blood (includes urgent referrals)
- Amniotic Fluid
- CVS
- MRA
- Microarray (pilot)
- Fanconi Anaemia (pilot)

8.3 Haematology-Oncology Scheme –

- Myeloid (previously AML/MDS/CML)
- LPD
- ALL (change)
- Tumour

8.4 Laboratory codes

Please use your unique laboratory code in all communications with the Scheme (including emails).

8.5 Future Developments to Management System (QA Manager)

The static website has been updated. The 2011 timetable and Participants' Manual for 2011 are also available on the website.

A number of changes to the QA Manager are in development and will be implemented in the course of the year.

8.6 Performance criteria

New performance criteria have been ratified by NQAAP and are available on the static website. There are new performance criteria for the microarray EQA.

9. Scheme finances

The Scheme finances are healthy and financial returns are submitted annually to UK NEQAS Central Office in Sheffield. Laboratories who provided assessors for the 2010 Scheme will receive a credit of £100 per assessor on their invoice for 2011.

10. CPD recognition for activities within the Scheme

Scheme-based activities performed by the assessors are accredited by the Royal College of Pathologists for CPD (6 CPD credits).

11. Scheme presentations

The Scheme Organiser or Quality Manager for UK NEQAS for Clinical Cytogenetics have given presentations on quality issues at the following meetings:-

- Participants' Meeting, London, July 2010 (RJH)
- Symposium plus Workshop, ESHG Conference, Gothenburg, Sweden, June 2010 (RJH)
- Goldrain Cytogenetics Workshops, Goldrain, Italy, September 2010 (RJH)
- International Congress for Maternal and Infant Health, Barcelona, Spain, September 2010 (BQP)

The participants' meeting expenses were met from UK NEQAS income. Conference fees and travel expenses for all other meetings were met from other income sources.

12. Annual Participants' Meeting

The 2011 Participants' Meeting was held during this year's ACC Spring Conference in Durham University at 9.00am on Tuesday 5th April.

Appendix A

Final summary reports scores

Constitutional Scheme	Registered	Non submission	Satisfactory	Poor	%PP
Bloods	55	2	48	5	13
Amniotic Fluids	48	0	46	2	4
Chorionic Villus	34	1	33	0	3
MRA	36	0	34	2	6
Urgent Blood	32	0	32	0	0
Total Constitutional	205	3	193	9	26

Haematology-Oncology Scheme	Registered	Non submission	Satisfactory	Poor	%PP
CML	51	1	44	6	14
ALL	43	0	42	2	5
AML	44	0	40	4	9
Solid Tumour	23	1	22	0	4
LPD	44	0	35	9	20
Haematology-Oncology	205	2	183	21	52