

# NATIONAL SCREENING COMMITTEE

## ANTENATAL SCREENING FOR DOWN'S SYNDROME – POLICY AND QUALITY

### ISSUES

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#### EXECUTIVE SUMMARY

- This report is based on a report from the NHS Health Technology Assessment Programme (1), other research (Appendix 2), a review of Down's syndrome screening in England (2), and the experience of those professionals who have been involved in the consultation process.
- National action is necessary and urgent to offer all pregnant women screening with a good standard of effectiveness, safety and quality.
- Minimum acceptable standards will also be defined, and programmes that can achieve higher standards should be encouraged to do so.
- Currently, the minimum acceptable standard is that all women should be offered screening by tests that produce a 60% detection rate and a 5% false positive rate by the 1 April 2004.
- Good standard screening requires all women who present in the first trimester to be offered screening that will achieve a 75% detection rate and less than 3% false positive rate by 1 April 2007. The rate of progress will be determined principally by the rate at which good quality nuchal translucency screening can be developed. Early booking should be encouraged and

facilitated, and different ways of arranging ultrasound screening and the blood test will be explored to optimise the tests and minimise the inconvenience for women.

- This policy will also provide cost-effective screening for trisomy 18 and trisomy 13; there is no national policy to screen for sex chromosome abnormalities.
- Good standard screening requires all women who present in the second trimester to be offered triple screening by 1 April 2005, and quadruple screening at a date to be determined when the Inhibin-A pilot study has been completed.
- The integrated test and the serum integrated test should be piloted in a programme, or programmes, in addition to that programme in which it has been developed. The serum integrated test will be of particular importance to populations whose services have difficulty in developing ultrasound of adequate quality.
- A comprehensive quality assurance programme should be supported.
- There should be continuing investment in research and development.
- The programme should take into account the diverse needs and preferences of women.
- All these measures should be implemented and managed as part of a national Down's Syndrome Screening Programme which should report annually.

- The ethical implications of all screening programmes are important. These implications are particularly important in antenatal screening and the need to respect the values and beliefs of different groups and individuals is of highest importance.

These recommendations have cost implications which will be offset in part by reductions in the cost of invasive testing and diagnosis.

## **ANTENATAL SCREENING FOR DOWN'S SYNDROME – POLICY AND QUALITY ISSUES**

### **1. The imperative for change**

The variations in policy and practice, and in quality and safety of Down's syndrome screening programmes make the present situation untenable. Change is necessary to offer all women a programme of acceptable quality and safety.

Action is necessary and urgent to tackle the main problems and the need to solve major problems quickly requires action that will bring all programmes up to an acceptable standard and offer all women screening in both the first and second trimesters. Some programmes will be able to offer services of a higher standard and the long-term aim would be to bring all programmes up to this standard. The difficulty in achieving this should not divert attention from the need to achieve an acceptable standard.

### **2. Variations in practice and quality**

The National Screening Committee turned its attention to Down's syndrome screening because of reports that there were worrying variations in policy, practice and service quality. These reports were substantiated by the national survey of Down's syndrome screening that was carried out by the Down's Syndrome Screening Development Team, which was set up to improve the quality of screening (1) (see Table 1 below).

| <b>Table 1: The gap between current service provision and the best available situation (5)</b> |                             |
|--|-----------------------------|
| <i>Type of test</i>  | <i>Number of programmes</i> |
| No test offered  | 11                          |
| Nuchal translucency (NT) only  | 29                          |
| NT and hCG   | 26                          |
| Double test – AFP, hCG   | 107                         |
| Triple test – AFP, hCG, uE3  | 31                          |
| Quadruple test – as above including Inhibin A  | 1                           |
| Inhibin A as part of the triple test   | 2                           |
| <b><i>Total</i></b>  | <b><i>207</i></b>           |

Top priority for the National Screening Committee was to tackle the variations in quality, because whatever the screening policy adopted in one part of the country or another, the impact on the population served by that service was determined by the quality of service offered. Obviously there was a need to work towards a common policy for the country as a whole, but when the NSC started its work on Down's syndrome screening, it did so knowing that the Health Technology Assessment Programme had commissioned work specifically to advise on policy options in 1995.

### 3. Evidence-based screening

The National Screening Committee and its officers are part of the national public health service. It is not a Research and Development Committee and has neither the remit, competence nor resources to commission research. The National Screening Committee and its officers base their decisions on the evidence produced by research workers, principally on the Health Technology Assessment reports produced by the R&D Programme of the English Department of Health. Some decisions are based on MRC trials and research sponsored by other funders, but the main evidence base for the National Screening Committee is the Health Technology Assessment Programme. The committee has made use of all of the reports on screening produced by the HTA Programme, about twenty in number.

Thus the National Screening committee started to work on variations in practice and quality, seeking to increase the detection rate and improve safety, but did not go into the details of policy-making while awaiting the results of the HTA study. One policy issue that was tackled by the National Screening Committee, however, was the issue of equity, and in 2001 guidance was issued that all women who were pregnant should be offered Down's syndrome screening using any method that would achieve a 60% detection rate and a 5% false positive rate. Both ultrasound screening and serum screening can achieve this standard which, although considered modest by a number of people, represented a significant increase in coverage for the population as a whole because in many parts of the country screening was offered only to women over a certain age, and the age threshold itself varied from one part of the country to another.

The HTA report, *First and second trimester antenatal screening for Down's syndrome: the results of the Serum, Urine and Ultrasound Screening Study*, known as the SURUSS report, was

eventually published in April 2003, although drafts of the report had circulated for some time before this and had been considered at a major workshop held on 2 December 2002.

The NSC paper is, like other National Screening Committee papers, based primarily on the study that was commissioned by the Department of Health. The comments on the draft of this report, which was made widely available in May 2003, inevitably related not only to the draft of the report itself but also to the HTA report. Of the 46 comments made on the draft of this paper which was widely distributed and made available on the National electronic Library for Screening, only one of them, from the Laboratory Sub-Committee of the Down's Syndrome Screening Management Group of the National Screening Committee, separated comments on the SURUSS report from those on the NSC report. The other respondents merged their comments on the HTA report and the NSC report.

### ***3.1 The evidence base – June 2003***

Respondents to the paper, who also took the opportunity to make specific comments about SURUSS, highlighted three issues about the SURUSS methodology and governance:

1. the failure of the SURUSS report to cite a number of studies in its references (Appendix 2);
2. the relatively small number of Down's syndrome pregnancies included in the SURUSS report and the modelling assumptions based on this number;
3. the perception that the conclusions would not be seen as unbiased because of the declaration of interest made by one of the authors of the report.

The last of these is perhaps the easiest to deal with in the short term, although the problem of the perception of conflict of interest may remain; neither the principal author of the HTA report, who declared his interest clearly, nor any of the other authors, will be involved in the final decision-taking. The first two comments will be referred to the HTA Programme, which seeks comments on published reports. All these issues were raised in the five referees' reports and dealt with by the authors and by the HTA editors over a period of six months, but a difference of opinion still persists, and it is difficult to see how this can be resolved either without a correspondence column debate, as would be the case if the SURUSS report had been published in a conventional journal, or with a definitive meta-analysis of all the studies that were deemed to be of adequate rigour.

The potential conflict of interest has been addressed by the explicit declaration of interest and by the exclusion of those who declared an interest from the final decision-taking process. It is customary to involve suppliers of goods and services in decision-making because of their technical expertise, but to exclude them from the final decision-taking, and this has been the process in these deliberations.

### **3.2 *The SURUSS report results and conclusions***

The main results from SURUSS are set out below (Table 2).

| <b>Table 2: The main results from SURUSS</b> |  |                                   |                                 |
|--|--|-----------------------------------|---------------------------------|
| <i>Test (all include maternal age)</i>       | <i>Measurements</i>  | <i>FPR for 85% detection rate</i> | <i>95% confidence intervals</i> |
| Integrated test:                             | NT and PAPP-A at 10 weeks and AFP, uE <sub>3</sub> , free β-hCG and Inhibin-A at 14-20 weeks | 1.2% (1.3%*)                      | 1.0-1.4 (1.2-1.4*)              |
| Serum Integrated test:                       | Integrated test without NT. PAPP-A at 10 weeks   | 2.7% (4.9*)                       | 2.4-3.0 (4.4-5.4*)              |
| Combined test:                               | NT, free β-hCG and PAPP-A at 10 weeks  | 6.1% (6.0*)                       | 5.6-6.5 (5.5-6.5*)              |
| Quadruple test:                              | AFP, uE <sub>3</sub> , free β-hCG, Inhibin-A at 14-20 weeks                                  | 6.2%                              | 5.8-6.6                         |
| Triple test:                                 | AFP, uE <sub>3</sub> , free β-hCG at 14-20 weeks   | 9.3%                              | 8.8-9.8                         |
| Double test:                                 | AFP and free β-hCG at 14-20 weeks  | 13.1%                             | 12.5-13.7                       |
| NT:  | Nuchal translucency at 12-13 weeks   | 20.0%                             | 18.6-21.4                       |

FPR = false positive rate; DR = detection rate

\*NT and /or serum measurement at 12 weeks

An important feature of the SURUSS report is that these different tests are compared using the same risk cut-off. The risk cut-off is 1 in 250 mid-term; this is not to imply that this is the cut-off point that would be used in practice. The cut-off used in practice is recommended as being 1 in 250 at term, but for the purpose of appraising and comparing tests or programmes, a standard cut-

off is needed that allows tests used in the first trimester to be compared with tests used in the second trimester, and for this reason 1 in 250 at mid-term is the cut-off used in the SURUSS report.

Results from several published studies of the effectiveness of first trimester screening combined NT and biochemistry testing have shown better detection rates and better false positive rates than quoted in the SURUSS report, with detection rates of over 90% and false positive rates of around 5%. These have usually been achieved in centres with rigorous management of the quality of the NT measurement. However, direct comparison of detection rates and false positive rates between publications is complicated because of assumptions that may be made about fetal loss rates and the age profile of the women being screened.

The main conclusions of the SURUSS report are set out below.

*“Our results showed that overall, on the basis of efficacy, safety, and cost, the integrated test is the test of choice. Adding other markers provided little benefit. The integrated test yielded an 85% detection rate for a false-positive rate of 1.2% or a satisfactory NT measurement was obtained for all or nearly all pregnancies and PAPP-A was measured at 10 complete weeks. If an NT measurement was not available, the serum integrated test (using the same serum markers) would be the next best screening method (85% detection rate for a 2.7% false-positive rate), materially better than any first or second trimester serum screening test.*

*The benefits of integrating markers across the two trimesters is greater than might intuitively be expected; it decreases the false-positive rate substantially, compared with screening in either trimester alone. It therefore has a large impact in reducing the number*

*of women requiring an invasive diagnostic procedure and hence reducing the loss of unaffected pregnancies.*

*For women who present for the first time in the second trimester of pregnancy, the SURUSS results suggest that the quadruple test is the test of choice, confirming the results from other studies. For women who request a screening result and a diagnosis and a diagnosis made before 14 completed weeks of pregnancy, the combined test was found to be the best option, though women would need to be informed that the efficacy and safety of this screening and diagnostic regimen is inferior to the use of the integrated test.*

*The SURUSS results show that in antenatal screening for Down's syndrome it is now possible to obtain a high level of detection (detecting 8 or 9 out of every 10 affected pregnancies) with a false-positive rate (1-2%) that is substantially lower than in the past, so achieving a significantly higher level of safety by reducing the number of women who need an invasive diagnostic test such as amniocentesis."*

Certain of the conclusions receive a broad level of support from respondents, notably that:

- screening in the first trimester with a combination of nuchal translucency (NT) and biochemical testing provides acceptable detection and false positive rates, with one respondent proposing that NT alone would achieve adequate quality if it was well done;
- acceptable levels of detection and false positive rates can be obtained by the use of the serum screening test for women who present in the second trimester;

- no feature other than nuchal translucency thickness can be used in ultrasound screening at present; all other markers should be used only in the context of a peer reviewed and ethically approved research project.

The main criticism of the SURUSS report conclusions, as distinct from the criticisms of research method and governance listed above, were:

1. the recommendation that Inhibin-A be introduced immediately to the NHS as a whole to create the quadruple test was not supported without further work;
2. the performance of nuchal translucency screening was said to achieve higher detection and false positive rates than reported in the SURUSS report, provided the screeners had been properly trained; however, although criticising this aspect of the SURUSS report, only one responder suggested that nuchal translucency alone provided an adequate screening test in the first trimester;
3. the integrated test and the serum integrated tests posed too many practical problems to be introduced nationally at present, even if all parts of the country had the combined test for the first trimester and the quadruple test for the second trimester; among the concerns raised about the implementation of the integrated test were:
  - that in any population that was socially transient and sought care from more than one provider, the problems of integrating the two test results were not to be underestimated;

- that the ethical issues associated with holding data from the first trimester test had not been clearly described, and the way in which the options inherent in the integrated test could be put to women had not been described and tested in an ordinary service setting;
- that the feasibility of translating savings from reductions in referral for diagnostic testing to laboratory services was felt to be more difficult in practice than in theory.

### **3.3 *Implications for safety of different tests and strategies***

The choice of tests is based on the characteristics of the tests, expressed as their detection rate and their false positive rate, equivalent to the terms “sensitivity” and “1-specificity” which are more commonly used in screening technology appraisal. In Down’s syndrome screening, however, these rates also vary depending on the “risk cut-off” chosen as a threshold for defining results deemed to be “positive” or “higher risk”, and therefore determining the number of women offered a diagnostic test, chorionic villus sampling, or amniocentesis.

Table 3 shows the number of Down’s syndrome pregnancies and the number of unaffected pregnancies lost from amniocentesis or chorionic villus sampling (CVS) at two detection rates (75% and 85%). At an 85% detection rate the four tests recommended by the SURUSS authors achieve a ratio of 4 or greater in the number of Down’s syndrome pregnancies detected to the number of procedure-related unaffected fetal losses (Table 4).

| <b>Table 3: Outcome in 100,000 women screened (1)<br/>(derived from Table 20 in the SURUSS report)</b> |  |                                  |                                  |  |  |                                  |                                  |  |
|--|--|----------------------------------|----------------------------------|--|--|----------------------------------|----------------------------------|--|
| <i>75% detection rate</i>  |  |                                  |                                  |  | <i>85% detection rate</i>                  |                                  |                                  |  |
|  | Unaffected women referred for CVS or amnio | No. of Down's syndrome diagnosed | No. of unaffected fetuses lost * | No. of Down's syndrome diagnosed per unaffected fetuses lost | Unaffected women referred for CVS or amnio | No. of Down's syndrome diagnosed | No. of unaffected fetuses lost * | No. of Down's syndrome diagnosed per unaffected fetuses lost |
| Tests  |  |                                  |                                  |  |  |                                  |                                  |  |
| Double   | 6,500                                      | 152                              | 47                               | 3.2  | 13,100                                     | 173                              | 94                               | 1.8  |
| Triple   | 4,200                                      | 152                              | 30                               | 5.1  | 9,300                                      | 173                              | 67                               | 2.6  |
| Quadruple  | 2,500                                      | 152                              | 18                               | 8.5  | 6,200                                      | 173                              | 45                               | 3.8  |
| Combined   | 2,300                                      | 152                              | 17                               | 9.0  | 6,100                                      | 173                              | 44                               | 3.9  |
| Serum integrated   | 800  | 152                              | 6                                | 25.4   | 2,700                                      | 173                              | 19                               | 9.1  |
| Integrated   | 300  | 152                              | 2                                | 76.3   | 1,200                                      | 173                              | 9                                | 19.2   |

\* Assuming an 80% acceptance rate of amniocentesis or chorionic villus sampling and 0.9% loss rate.

The detection rate and the benefit:hazard ratio are the two key criteria in specifying how the four tests should be interpreted in a systematic and rational way. A mid-trimester risk cut-off of 1 in 250 will achieve a ratio of four or greater with all four tests and exceed a detection rate of 80% (see Table 4).

| <b>Table 4: Detection rate and false-positive rate using a 1 in 250 mid-trimester risk cut-off level according to test (derived from Tables 30 &amp; 31 in the SURUSS report)</b> |                    |                         |         |
|---|--------------------|-------------------------|---------|
|   | Detection rate (%) | False-positive rate (%) | DSD:UFL |
| Integrated test*  | 90                 | 2.8                     | 9.0     |
| Serum integrated test*  | 88                 | 4.0                     | 6.2     |
| Combined test*  | 83                 | 5.0                     | 4.7     |
| Quadruple test*   | 84                 | 5.7                     | 4.2     |
| Triple test*  | 81                 | 6.9                     | 3.3     |

DSD = Number of Down's syndrome pregnancies diagnosed

UFL = Number of unaffected fetal losses

\* = First trimester markers measured at 10 weeks

### **3.4 Cost-effectiveness**

Because of the reduction in referrals, the cost of shifting from double to triple testing is estimated as being offset by the reduction in diagnostic costs, as shown in Table 5.

| <b>Table 5: The cost of shifting from double to triple testing, offset by the reduction in diagnostic costs<br/>(Derived from costs cited in SURUSS report)</b> |                           |                           |                           |
|---|---------------------------|---------------------------|---------------------------|
| <i>Nationally *</i>   |                           | <i>For an average PCT</i> |                           |
| Reagent costs   | Diagnostic services costs | Reagent costs             | Diagnostic services costs |
| £560,000<br>(Increase)  | £3,240,000<br>(Decrease)  | £2,000<br>(Increase)      | £11,700<br>(Decrease)     |

\* Assuming: 1) one-sixth of women are already being offered triple test;  
2) 80% acceptance of offer.

The addition of uE3 to the double test to create the triple test is not likely to require additional laboratory equipment in a large proportion of laboratories. The costs of moving from triple to quadruple testing are of the same magnitude with respect to the costs of reagents, but there will be a capital cost associated with this; this is being studied by the Laboratory Sub-Group of the development project.

The Laboratory Screening Sub-Group of the Down's Syndrome Screening Management Group was unanimous in advising that Inhibin-A could not be recommended for national introduction at present, and on the basis of this advice, the pilot study of the use of Inhibin-A and its costs and service implications should be conducted. This will take place in Glasgow and the west of Scotland.

The additional costs of introducing the combined test relate both to the cost of offering PAPP-A as a serum test and the cost of the high quality ultrasound service that is required. This issue will be further explored by the National Screening Committee during 2003 as part of the Antenatal Sub-Group's review of fetal anomaly screening and ultrasound services.

It is also important to emphasise that anxiety is associated with a referral for diagnosis; this has not been costed in financial terms but its impact, both short-term and long-term, should not be underestimated.

### **3.5 *The integrated test***

The SURUSS results demonstrate the potential value of integrating tests in the first and second trimester. However, experience with the integrated test is relatively limited. At the workshop on 2 December 2002 it was reported that the integrated test was being used and was acceptable to a proportion of women in Maine, Ontario, and in north London. More information is being gathered about the actual use of the integrated test and about the way in which choices are put to women who need to understand that they could either make a decision after the first trimester test or, at the cost of some weeks of anxiety, have a higher detection rate and a lower false positive rate by combining their first trimester results with the results of serum tests in the second trimester.

Of the 24 responses that were received, three respondents were in favour of introducing the integrated test without piloting, and two of these respondents were authors of the SURUSS report. It is therefore proposed that the integrated test be piloted and evaluated in a programme in which

there is both first trimester combined testing and second trimester serum testing of adequate quality.

#### **4. Policy recommendations**

On the basis of the evidence that is available, the following recommendations are made.

- The development of first trimester screening using the combined test, namely ultrasound screening of nuchal translucency combined with free  $\beta$ -hCG and PAPP-A, should be undertaken; to minimise the resource consequences nuchal translucency testing should be combined with the dating scan. A training and quality assurance programme needs to be developed to ensure that the nuchal translucency screening performed as part of dating is of adequate quality. The only marker to be used in ultrasound screening is nuchal translucency; all other markers should be measured in the context of ethically approved and peer reviewed research projects. The detection rate and false positive rate of using serum markers alone is unclear, and serum screening without ultrasound in the first trimester is not recommended.
- For all women who present in the second trimester of pregnancy, serum screening should be made available. Women should be offered the triple test in the second trimester.
- The feasibility of using Inhibin-A nationally should be evaluated in a pilot service so that the laboratory and financial implications can be examined.
- When satisfactory screening is in place in the first and second trimester, a pilot of integrated screening should be organised in a routine NHS setting. The attitudes and experience of

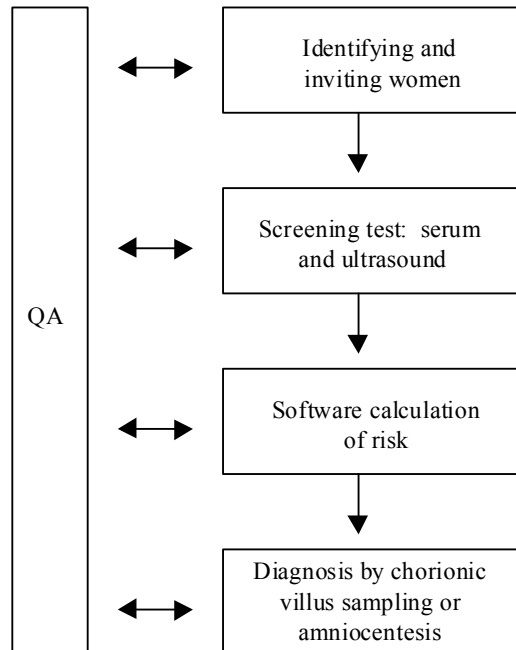
women both about the choice and about the effect of waiting should be the principal outcomes, although other factors relating to the feasibility of the test, particularly in inner city populations, also need evaluation.

- The serum integrated test should also be piloted.
- The comments made about the methodology of SURUSS should be fed back to the HTA Programme and the authors of SURUSS. This should include the references to studies not cited in the HTA report, with the recommendation that they consider commissioning an ongoing meta-analysis of the data.

## **5. Quality assurance and improvement**

Whatever screening policy is in place, it is essential to measure performance, compare it with standards, and seek to achieve improved performance year on year – a process of quality assurance and improvement. This process maximises the probability of benefit and minimises the probability of harm. The National Screening Programme has been working on measures to improve the quality of Down's syndrome screening for the last two years through a series of measures linked to, but distinct from, policy-making.

Screening is a programme, not a test, and the stages and components of the Down's Syndrome Screening Programme are set out in the diagram (Figure 1).



**Figure 1**

Each of these stages needs quality assurance and improvement.

### **5.1 Identifying and inviting women**

The outcome of screening is choice. The aim of the Down's Syndrome Screening Programme is to offer those women who might wish to make a choice the opportunity to do so. This requires not only that the woman is clear about the possible consequences of testing before she accepts the offer of testing, but also that she receives the information, advice and support needed to make a decision at each stage in the process.

There is also a need to ensure that professionals have a good understanding of the principles and practice of Down's syndrome screening and that they are able to discuss the issues with the woman seeking support.

#### *5.1.1 Action*

The National Screening Committee is:

- developing and evaluating an information source for women, with the involvement of the Down's Syndrome Association, to ensure that a balanced picture is presented;
- negotiating with NHS Direct Online, and other providers of public information, to ensure that the information presented on Down's syndrome screening has the same standards of clarity and comprehensiveness;
- piloting a test to measure the NHS Advisory Centre on Patient Surveys' experience of women offered antenatal screening that could be used in surveys of women using antenatal services;
- developing training programmes for clinicians and co-ordinators;
- commissioning a database of the experience of individuals from the charity DIPEX – the Database of Individual Patient Experience – which would allow a woman to reflect on the experiences of other women who have faced similar choices;

- commissioning research to study the potential adverse impact on health inequalities of increasing the complexity of the information offered;
- developing a race equality scheme under the Race Relations Amendment Act to ensure that the Down's Syndrome Screening Programme takes into account ethnic and cultural diversity.

## 5.2 *Serum testing*

Like many other biochemical tests, inter-laboratory variation can be observed when Down's syndrome screening tests are carried out in more than one laboratory. The development of National External Quality Assessment Schemes (NEQAS) and Clinical Pathology Accreditation (CPA) offer the opportunity of reducing inter-laboratory variation by improving the quality of the service, and all laboratories have to participate in external quality assurance and be accredited. What has also emerged are the problems that laboratories with small throughputs face in evaluating their performance because they may undertake too few tests to measure the detection rate reliably. A necessary pre-requisite of quality is, therefore, not only participation in external quality assessment but the throughput of the laboratory. The development of near patient testing, as part of "one-stop screening", also needs to be costed and evaluated and a project will be set up to do this.

### 5.2.1 *Action*

The Down's Syndrome Screening Programme will:

- work with the NEQAS and CPA schemes to ensure that all laboratories are covered by these schemes for CVS diagnostic procedures;

- encourage laboratories to work more closely together and increase volume where that is appropriate;
- ensure that the serum markers used for screening are licensed for use;
- explore the possibility of national procurement of markers and equipment;
- plan the introduction of PAPP-A and uE3 to minimise quality problems when these are introduced;
- pilot the use of Inhibin-A.

### ***5.3 Nuchal translucency testing***

A number of markers are associated with an increased probability of a fetus being affected by Down's syndrome. Several other markers are currently being examined in both first and second trimesters, notably absence of the nasal bone in the first trimester, but nuchal translucency measurement in the first trimester is at present the only risk marker identifiable by ultrasound screening which should be used in screening.

Ultrasound screening is an essential component of first trimester screening, if combined with serum markers, for example the measurement of PAPP-A and free  $\beta$ hCG, and of the integrated test. To develop and maintain adequate quality it is essential for the person who is going to carry out the ultrasound test to have had adequate training, and to participate in a quality assurance programme.

### *5.3.1 Action*

The National Screening Committee is;

- planning to commission, in association with relevant professional bodies, training and quality assurance;
- discussing with those responsible for training in ultrasonographic skills how appropriate training can be incorporated in all training programmes;
- standardising the definitions used in NT screening to minimise interobserver variability.

### *5.4 The quality of the risk calculation software*

The recent review of laboratories carried out by the National External Quality Assessment System, in partnership with the National Screening Committee project team, demonstrated that even when consistent results are obtained for biochemical testing, significant differences occur in the risk estimate given to the woman when identical data are fed into the different software packages.

The feasibility of offering a personalised risk estimate will be explored.

### *5.4.1 Action*

The National Screening Committee is:

- preparing a specification for the risk calculation software, based on the Scottish specification, as a basis for national procurement of a limited number of software packages.

### ***5.5 The quality of the diagnostic services – amniocentesis and chorionic villus sampling***

There is a risk to the normal fetus whilst in the process of diagnosis. The case for carrying out these tests in centres which are able to undertake a large number of tests annually is strong and programmes should take steps to ensure that the number of such tests carried out in centres meet minimum standards.

The use of molecular diagnostic techniques to supplement or replace karyotyping has been reviewed in a workshop on PCR/FISH testing organised in June 2003 to consider the implications of this technology.

To minimise the time women have to wait, diagnosis should be by QF-PCT; karyotyping may be indicated for clinical reasons but for screening QF-PCR is the technique of choice.

#### *5.5.1 Action*

The National Screening Committee is:

- supporting the development of evidence-based guidelines by the Royal College of Obstetrics and Gynaecology;

- to cost and plan QF-PCT testing services.

## **5.6 Programme management**

Screening is a programme, not a test, and someone has to have designated responsibility for the organisation and delivery of the Down's Syndrome Screening Programme.

The main task of the Director of Public Health is not to manage screening programmes but to ensure that his or her population is covered by a screening programme of adequate quality. Responsibility for the quality of the programme rests with the individual identified as being responsible for its co-ordination and management, with each specific service within the programme, for example, the biochemical laboratories, having responsibility for their service which forms part of the programme. A service manager may also be the programme manager but the two roles are distinct.

To manage the programme properly it is also necessary to have numbers of sufficient size to observe trends and discern variations from the standards set. It is therefore appropriate to aim for a programme of between 20,000 and 30,000 births per year. It may be that more than one laboratory will be present within a programme, bearing in mind the fact that laboratories, like programmes, often benefit from a higher throughput, but Down's syndrome screening programmes themselves need a significantly larger population base than is currently the case.

Regional Directors of Public Health will be asked to review the pattern of programmes in their Regions and take appropriate action to create larger programmes.

### *5.6.1 Action*

The National Screening Committee is:

- supporting the Register of Down's syndrome births to ensure that process measures of quality are complemented by outcome measures;
- working with Regional Directors of Public Health, Medical Directors of Strategic Health Authorities and the relevant professional groups to discuss the creation of larger population-based programmes and the possible implications for laboratory and other investigative services;
- making available software that can be used for programme review.

### *5.7 Private screening and testing*

The National Screening Committee aims to protect the health of the population, not simply to advise the NHS. Although screening policy and quality in the private sector is more difficult to regulate than in the NHS, the NSC has a duty to consider it. Public health professionals have to use the resources available to them to ensure that members of the public are neither misled by the claims of people providing private screening nor exposed to screening of poor or unknown quality.

There has been a rapid growth of testing for risk factors in the private sector in recent years, due in part to the lack of clarity in NHS policy. The screening has been introduced by large-scale and well-organised providers, but we have also seen a growth of small-scale testing, where individual

clinicians purchase the necessary equipment and carry out part of the screening programme. However, screening is a programme and not a test, and simply providing, for example, ultrasound screening without participation in an adequate quality assurance programme and without providing CVS or amniocentesis, is not providing a screening programme and should be discouraged. If private providers wish to provide screening, they should provide not only serum screening and ultrasound measurement of the nuchal translucency, but also ensure that there is sufficient provision to offer amniocentesis or CVS of adequate quality to people deemed at high risk by their programme. Furthermore, everyone involved in the provision of ultrasound screening in the private sector should be part of a recognised quality assurance programme and should produce an annual report which would allow their performance to be assessed against explicit standards. It also needs to be recognised that there is a possible conflict of interest in the advice that may be given by clinicians to the local providers or commissioners, if those clinicians are providers of screening in the private sector.

Part of the impetus for this development has been due to the lack of clarity about NHS policy. The clear commitment to provide support to the NHS services that have the capacity to develop nuchal translucency screening will reduce this uncertainty and thus reduce the motivation to develop screening outside general antenatal services.

#### *5.7.1 Action*

The National Screening Committee is:

- developing clear standards for ultrasound screening;

- creating programme standards which will require anyone who is providing a single part of the programme to participate in quality assurance and to relate the outcomes of their work to the next stage in the screening process so that the quality of their work can be measured and improved; this work will be done in partnership with the Commission for Health Care Audit and Inspection and the relevant professional Colleges and Societies.

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Spencer K, Nicolaidis KH. Screening for trisomy 21 in twins using first trimester ultrasound and maternal serum biochemistry in a one stop clinic: a review of three years experience. (Reference not yet available).

Professor Howard Cuckle also submitted his draft chapter for Milunski's textbook which contained 261 references.