Interpretation of feedback to radiology on nuchal translucency (NT) and crown-rump length (CRL) ultrasound measurements performed as part of the first trimester combined antenatal screening for Down syndrome and other conditions

In December 2015, the National Screening Unit (NSU) of the Ministry of Health began to provide regular feedback to radiology practices, radiologists and ultrasound operators, in the form of statistical evaluation reports, as part of a quality improvement initiative. The aim of the initiative is to enhance the quality of NT and CRL measurements, and to ensure women are receiving the highest quality risk result for antenatal screening for Down syndrome and other conditions, with a view to improving the overall reliability of first trimester combined screening.

The statistical evaluation reports contain an assessment of the paired NT and CRL measurements performed by each ultrasound operator, reviewed by each radiologist, or performed in each practice over the time period with an accompanying description and flags to indicate performance in three key areas:

- Bias – The difference between the NT and CRL measurements in relation to the FMF reference curve.
- Spread – The way most measurements cluster along the FMF curve.
- Trend – The shape and direction of the curve of NT and CRL measurements relative to that of the FMF reference curve.

Bias

The overall bias of paired NT and CRL measurements is estimated relative to the FMF reference curve and is the primary focus of the feedback. Ideally, half the measurements should lie above the curve and half below.

The most frequently occurring departure is a tendency to under-measure the NT. The effect of this practice is a shift in NT measurements downwards relative to the FMF reference curve.

Feedback on the degree of bias observed in each dataset is indicated using a Red (R), Amber (A) or Green (G) Flag.

Flag type	Interpretation
G	NT Bias relative to FMF reference curve is 0.10mm or less.
A	NT Bias relative to FMF reference curve is between 0.11mm and 0.30mm.
R	NT Bias relative to FMF reference curve is 0.31mm or greater.

Comments beneath the graph will describe the magnitude and direction of the bias.

Spread

A flag for spread is given on the reports to indicate whether, after taking account of CRL, the spread of NT measurement is greater or less than expected from the FMF reference curve. Only Green or Amber Flags are given for spread and the comments specify whether the NT measurements are more or less spread from the FMF reference curve.

Flag type	Interpretation
G	No evidence of substantive difference from the FMF reference curve
A	Substantive difference from the FMF reference If more spread than expected, the factor will be greater than 1 If less spread than expected, the factor will be less than 1

Trend

A flag for trend is given on the reports to indicate if there is a trend deviation from the FMF reference curve. A trend deviation describes the relationship between NT and CRL measurements in relation to the direction of the FMF reference curve. Only Green or Amber Flags are given for trend and the comments describe the direction of the trend deviation.

Flag type	Interpretation
G	No evidence of substantive trend deviation.
A	After allowing for any overall bias, the NT measurements show a trend deviation.

NT measurements of 3.5mm or more

The proportion of NT measurements of 3.5mm or more should be around 1% in a screened population. In datasets where there are at least 250 scan measurements, the proportion of those of 3.5mm or more is reported. If the proportion is less than 1%, this is also mentioned in the narrative included within the report.

Number of scans required for reliable statistical analysis

Twenty-five NT and CRL scan measurements in a six month period are usually required for statistical validation. All ultrasound practitioners who perform fewer than 25 NT and CRL scans in the period will still have received a plotted graph but will have been assigned a White Flag.

Reports are based on cumulative totals over a two year period. When ultrasound practitioners reach the target of 25 scans, their reports going forward will be based on the most recent 25 scans in the dataset.

In data sets of 4 or more scans, an indicative Green, Amber or Red flag has also been assigned where the bias is evident.

Spread or trend has not been assigned until a cumulative total of 25 scans are reached.

Interpretation of reports for ultrasound practitioners

Ultrasound practitioners, who receive a Green Flag for bias, spread and trend should be regarded as having satisfactory performance. No action is required to continue screening.

It is recommended that ultrasound practitioners who receive an Amber Flag for bias should discuss the adjustments required to improve practice with the person in the practice nominated to support the feedback process – ideally an ultrasound practitioner who has received a Green Flag report or a radiologist.

Ultrasound practitioners who receive a Red flag for bias should be regarded as having unsatisfactory performance. Further training, support, advice and supervision are recommended until measurements improve to receive Amber or Green Flag status for bias.

Interpretation of reports for radiologists

Reports for radiologists show the results for the NT and CRL measurements reviewed and reported during the period.

The same flag system is used to highlight the quality of the scans signed out by radiologists in terms of bias, spread and trend.

It should be noted that the feedback to radiologists is based on the *combined results of more than one practitioner*. Therefore, a Green Flag for a radiologist does not necessarily indicate the satisfactory performance of all practitioners contributing to that result (i.e. a practitioner with positive bias could nullify the effect of one with negative bias). This initial feedback does not include details of individual practitioners. However, future reports may do so if requested by the sector.

In the meantime, it is recommended that radiologists increase attention given to all reports signed out by them.