

SOUTH AUSTRALIAN & TASMANIAN MATERNAL SERUM ANTENATAL SCREENING PROGRAM[©]

Department of Genetic Medicine
4th floor Rogerson Building
Women's and Children's Hospital
NORTH ADELAIDE SA 5006



Phone (08) 8161 7285
Fax (08) 8161 8085
E-mail samsas@wch.sa.gov.au
www.chempathadelaide.com/samsas

First Trimester Screening NT Provider Progress Report 4

01/04/05

Dear Colleague,

Your NT Provider Code is

You have been chosen from your practice to receive this progress report. Please review and discuss with your group. Results are confidential and coded so that only you know your code. To maintain confidentiality your code will have changed from the previous report. If you wish to nominate another individual from within your organisation to receive these reports please let us know. Code 20 is a collective group for those NT providers with too few measurements to be displayed individually.

Nuchal Translucency Measurements

Enclosed are graphical representations of nuchal translucency (NT) measurements submitted to the SAMSAS program from South Australia, Tasmania and Northern Territory, for the 2004 Calendar year during which 8727 valid combined risk assessments were issued.

From our smoothed curve, a CRL of 43 mm corresponds to 11 wks 0 days with 81 mm being 13wks 6 days. When measuring the NT, if the fetal position and image is optimal but the CRL is a few mm outside the above range, still measure and report the NT, chances are the blood sample is within the acceptable gestational age window. If in doubt please call us on 08 8161 7285. SAMSAS software is designed to and our staff are trained to pickup discrepancies in submitted gestational age information; consequently corrections are initiated before risk calculations.

An important point to note is that 1st trimester blood samples are accepted from 10wks to 13wks 6 days, they DO NOT have to be collected on the same day as the nuchal scan. Any gestational age variations for the blood samples will be automatically corrected back to the collection date once the NT report is received. The optimal time for the blood sample is 10-12 wks.

Most data presented in this report are in the form of Box Plots. A number N= is displayed on the X axis, this represents the number of measurements displayed in the box plot for the respective group. The Box Plot provides summary statistics visually, eliminating the need for detailed statistical knowledge. The Box includes the 25th to the 75th percentiles (or the interquartile range, IQR), with the median (or 50th percentile) being the line in the box. 50% of cases fall within the Box. The tails or whiskers at either end of the box display the smallest and largest observed values that are not outliers. From the length of the box you can determine the spread or variability of your measurements. If the Median value is not in the centre of the box, then your measurements are skewed.

Representing the NT measurements in multiples of the population median (MoM), eliminates variability from differences in gestational age. For example, 1 MoM at 11 weeks is directly comparable to 1 MoM at 12 weeks etc, whereas the respective measurements in mm would be different.

Figure 1 shows the NT MoM distributions for each NT provider. From this display one is able to compare measurements between groups. Ideally for each group the median measurement should be 1 MoM with the box distribution being tight around 1 MoM.

Those groups deviating from the reference line are advised to review their measuring technique.

NT provider 9, in particular, needs to review their practices as 46% of their measurements lie below the reference line when only 25% would normally be expected. Lower than average measurements will result in an underestimate of risk.

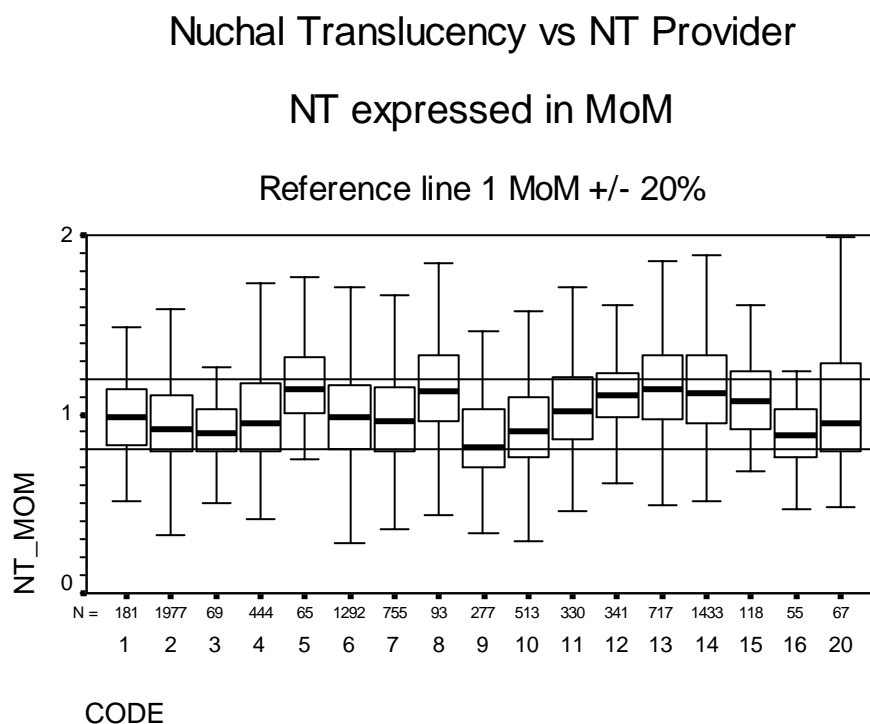


Figure 1

It is imperative that all NT providers follow the same measurement technique. The recommended method is taught by the NT Ultrasound, Education & Monitoring Program and is discussed under “Newsletters” in their website, www.nuchaltrans.edu.au. This site contains information on training and accreditation programs, all provider groups are encouraged to have registered sonographers. **In addition to accredited sonographers and the SAMSAS progress reports, quality assurance procedures within each practice are strongly recommended.**

Caution needs to be applied when making inferences about the quality of NT measurements, as ascertainment bias may result from either too few measurements or from screening practices which may preselect screened pregnancies based on either high or low NT measurements. It is however correct to say that strict adherence to the recommended method of measurement will minimise variability, lead to tighter population distributions and assist in maintaining program performance. This point can not be stressed strongly enough.

Figure 2 shows the NT MoM distribution for all NT providers combined. It represents the overall population distribution of NT measurements and is a graphical representation of data in Table 1. We want to keep the box between 1 MoM +/- 20%.

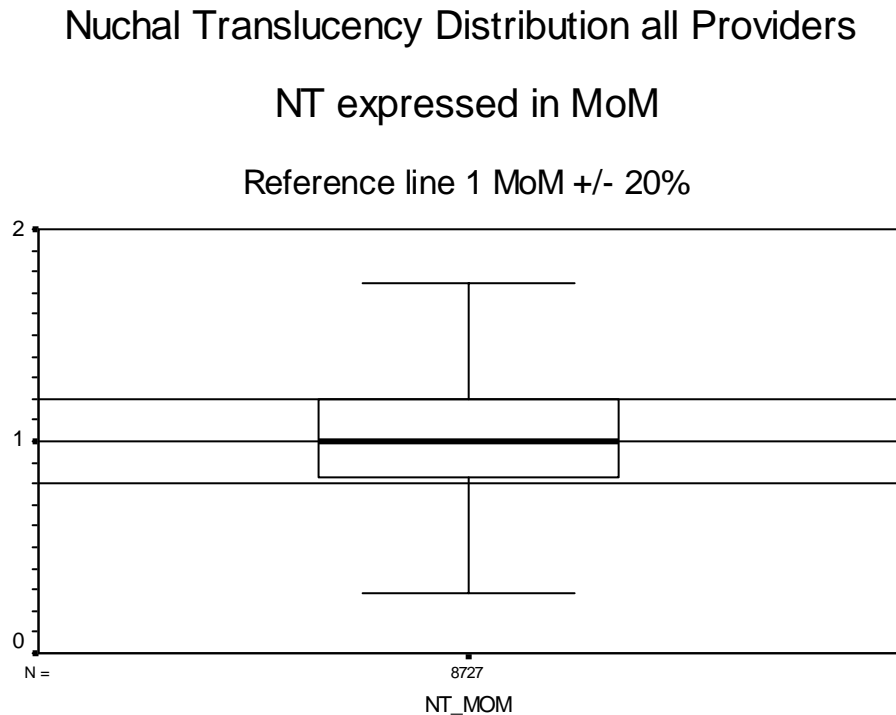


Figure 2

Table 1 shows summary data of NT MoM's for four NT progress reports. The data suggests stability in the NT distribution. This is pleasing as the number of NT provider groups has increased. The stability displayed supports current practices and the continued use of NT in the screening program.

Table 1

| | Report 1 Dec'01 | Report 2 May'03 | Report 3 April'04 | Report 4 April'05 |
|----------------------------------|--------------------|--------------------|----------------------|----------------------|
| Number of NT Provider Groups | 8 | 12 | 17 | 17 |
| Number of NT measurements | 1,845 | 2,465 | 8,198 | 8,727 |
| Percentile | MoM | MoM | MoM | MoM |
| 5 th | 0.6 | 0.59 | 0.61 | 0.62 |
| 25 th | 0.82 | 0.82 | 0.83 | 0.83 |
| 50th or Median | 0.99 | 1.0 | 1.01 | 1.00 |
| 75 th | 1.19 | 1.22 | 1.21 | 1.20 |
| 95 th | 1.62 | 1.63 | 1.63 | 1.60 |
| Interquartile Range (IQR) | 0.37 | 0.4 | 0.38 | 0.37 |

For the 8,727 screens performed the median maternal age at delivery was 31.4yrs, the median gestation for blood samples was 12wks 2 days and 12wks 3 days for the nuchal translucency scans.

First Trimester Combined Screening Strategy Performance

Since June 2001 SAMSAS has screened in excess of 26,000 pregnancies in 1st trimester, audits for 2003 and 2004 are not yet complete, however there are to date 46 confirmed cases of Down syndrome.

Table 2 is a summary of performance from this data set, comparing the combined strategy to biochemistry only and NT only.

The overall median monthly patient MoM values for the 4 years are NT = 1.0, free beta = 1.01, Papp-A = 0.98, median maternal age was 31.4 yrs and the % Recall Rate was 5.6%.

The 46 affected cases have median MoM values of NT = 1.7, free beta = 2.2, Papp-A = 0.5 with a median maternal age of 36.6yrs. Median gestation for blood samples was 12wks 1 day and for the NT 12wks 3 days.

These findings and in particular those summarised in Table 2 below are similar to those in the SURUSS report. SURUSS stands for Serum, Urine and Ultrasound Screening Study, a UK based study. The full report can be accessed on <http://www.nchta.org> , and Search for SURUSS.

Table 2

| | Downs Population | Background Population | |
|---|------------------------------|-----------------------------|----------------------------|
| NT measurements ≥ 2.0 MoM | 21/46 or 46% | 2.2% | |
| NT measurements ≥ 2.0 mm | 27/46 or 59% | 12% | |
| 1st Trimester Down syndrome screening | | | |
| | Combined (NT + Biochemistry) | Biochemistry only | Nuchal Translucency only |
| Actual Performance | 41/46 DR 89.1% RR 5.6% | 40/46 DR 87% RR 11.1% | 29/46 DR 63% RR 6.1% |
| Missed | 5 | 6 | 17 |
| Performance for a fixed 5% RR | | | |
| | 38/46 DR 82.6% | 32/46 DR 69.6% | 26/46 DR 56.5% |
| Missed | 8 | 14 | 20 |
| Performance for a fixed 3% RR | | | |
| | 36/46 DR 78.3% | 26/46 DR 56.5% | 23/26 DR 50% |
| Missed | 10 | 20 | 23 |

Some points which can be taken from the SURUSS report are as follows;

- SURUSS report Executive summary, page 4, table states that for NT only, there is a 20% RR for 85% DR. SAMSAS data confirms this showing a 19.8 %RR to detect 85% of cases (39/46), the risk cut off needing to be 1:1000!
- SURUSS report page 15 supports our observations that about 2% of unaffected pregnancies have NT MoM values ≥ 2 .

- SURUSS report pages 17 & 19 supports SAMSAS observed median MoM values in affected cases as stated above.
- SURUSS report page 20 supports SAMSAS observation of NT only performance at a 5%RR (where they state a DR 63%, 95%CI 51 to 75%).
- SURUSS report page 40 states NT "has poor performance as a screening test for Down's syndrome on its own or with maternal age alone." and supports its use with the two or more biochemical markers and maternal age.

In addition the UK National Screening Committee has set a benchmark of 75% or better detection for a 3% false positive rate, to be achieved by April 2007. This benchmark as shown in Table 2 has already been achieved by SAMSAS.

Summary

- Blood samples and nuchal translucency scans can be done on different days. It is preferable to have the blood sample collected before the NT scan.
- Sonography practices should have their own internal quality assurance procedures.
- NT provider group 9 should review measuring practice.
- From a population screening perspective the spread and stability of NT measurements continues to be acceptable.
- The combined screening strategy performance continues to be high and meets benchmark performance levels.
- Nuchal translucency screening alone has poor performance.

There are still some delays in SAMSAS receiving NT reports. Could all groups please reinforce to staff the need for copies to be e-mailed without delay. If a report is sent to the doctor then a copy can be sent to SAMSAS (this does not apply to OACIS users as SAMSAS has direct access). If your practice uses Promedius software please send reports under Dr A SAMSAS or Dr SAMSAS using the e-mail address samsas@promedius.net . Please contact Promedius on 03 9426 9988 if assistance is required.

South Australia is in a unique position of offering centralised services both with its maternal serum screening programs and with cytogenetic services. This feature means effective program management and evaluation. I would like to thank all participants within this service network. Your continued cooperation and input have the lead to the success of the program.

The data presented and the performances quoted in this report are those of the SAMSAS program and do not apply to other software or testing centres.

Yours sincerely,



Robert Cocciolone, BAppSc, Med Lab Sc, Head, Antenatal Screening (SAMSAS) Program