

# Earlier Gestations Increase the Risk of Screen Positive Quadruple Test Result

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The recommended screening test for Down's Syndrome between 14+2 and 20+0 weeks is the quadruple test. The UK National Screening Committee recommends a detection rate of greater than 75% and a screen positive rate of less than 3% (1). Reducing the false positive rate will reduce the overall number of invasive diagnostic tests and their complications. We looked at whether the screen positive rate in our hospital met these recommendations and how this varied with gestation at sampling and maternal age.

## Methods

We performed a retrospective cohort study of women with singleton pregnancy receiving the quadruple test for Down's Syndrome screening between 14+2 and 20+0 in a London hospital between July 2009 and January 2014. A positive result was a risk >1:150 for sampling after 1<sup>st</sup> Jan 2010 and >1:250 for sampling before this date (in keeping with Model of Best Practice guidelines). Patients were identified from screening records. Ultrasound data, amniocentesis results and pregnancy outcome were collected from hospital computer records for all women who delivered in our maternity unit.

## Results

- 1,800 women received the quadruple test over the study period. Maternal demographics characteristics and pregnancy complications are shown in Table 1.
- 79 women had a positive result (screen positive rate= 4%).
- 30% accepted invasive testing via amniocentesis. Fetal karyotype was normal in all amniocentesis samples.
- There was one confirmed case of Down's Syndrome in the screen positive cohort and two confirmed cases in the screen negative cohort (detection rate=33%).
- Screen positive rates decreased with increasing gestation (Table 2). Rates before 16+6 weeks were 5.4%, compared to 2.9% afterwards.
- As expected, screen positive rates increased with increasing maternal age (Table 3).

Gestational Age at Sampling (days)	Tests Performed (n)	Screen Positives (n)	Screen Positive Rate (%)
100-104	132	7	5.3
105-111	520	26	5
112-118	410	24	5.9
119-125	270	11	4
126-132	158	2	1.2
133-139	98	3	3
140-146	113	3	2.7
147-153	60	1	1.7

**Table 2: Screen Positive Rate by Gestational Age**

## Conclusions

In our small cohort of screen positive women who had amniocentesis, the karyotype was normal in all cases. Despite the small sample number, our study showed earlier gestation at sampling almost doubled the screen positive rate, with rates much higher than recommended levels. Larger studies are needed to confirm this finding. To avoid unnecessary invasive testing at this gestation we propose further research into alternative screening at this particular gestation.

**Table 1: Patient Demographics**

		%
Age (y)	<35	54
	35-40	27
	>40	19
Ethnicity	Black African, Carribean	27
	White Caucasian	28
	Indian, Pakistani, Sri Lankan, Bangladeshi	32
	Chinese	10
	Other	4
Hypertensive Disease	Pre-eclampsia	6
	Pregnancy induced hypertension	3
	Pre-existing hypertension	5
	Normotensive	86
Metabolic disease	Pre-existing diabetes	1
	Gestational diabetes	6
Smoking status	Smoker	3
	Non-smoker	97

**Table 3: Screen Positive Rate by Maternal Age**

Maternal Age at Sampling (y)	Tests Performed (n)	Screen Positives (n)	Screen Positive Rate (%)
15-19	34	0	0
20-24	342	7	2
25-29	619	22	3.6
30-34	567	28	4.9
35-39	274	23	8.4
40-44	51	19	3.7

1. Screening for Down's syndrome: UK NSC Policy recommendations 2011–2014 Model of Best Practice NHS Fetal Anomaly Screening Programme, 2011