SAFE MATERNITY ULTRASOUND IN THE WEST MIDLANDS: CURRENT DEMANDS ON RESOURCES

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PCTs are being asked for increased resources for maternity ultrasound from 2009/10, in parallel with a major effort of increased staff training. The table below outlines the various requirements currently being put forward for increased ultrasound services to support maternity care. This document has been prepared at the request of the Governing Board of the West Midlands Perinatal Institute, by Prof Jason Gardosi - Director WMPI and Mr Peter Thompson - Medical Director, BWH. It includes service modelling prepared by Ann Tonks, WMPI and members of the Regional Ultrasound Group [A].

	1st trimester	2nd trimester	3rd trimester
Current practice	Dating scans offered routinely as standard in WM, according to NICE guidance. Accurate dates important for pregnancy care as well as serum biochemistry. Current Downs screening based on 2nd trimester serum test.	Detailed mid trimester (18-20 weeks) scan including four chamber view of heart.	Assessment of fetal growth is not standardised, and follows varied protocols which are often adapted to the reality of ultrasound shortages.
Type of additional scan needed	Nuchal translucency ultrasound measurement as part of the 'Combined Test', done either as an extension of dating scan or separately	Cardiac outflow tract assessment in addition to mid T scan. Currently offered by 15% of units in WM, vs 57% in E&W.	Regular fetal 'growth' scans , including ultrasound measurement of fetal head, abdominal circumference and femur length as well as and amniotic fluid
Scope	All women being screened for Down's syndrome – currently approx 60 % across WM, varying with population	All women having a mid trimester assessment by ultrasound	Women considered high risk, or unable to be monitored by fundal height measurements alone; approx 25% of population .
Rationale	Preferred method by NSC to achieve Down's screening standard by 2010 (detection rate 75%, false positive <3%). Recommended by NICE Antenatal Care Guidelines (2008). **[B].**	Recommended by NICE in revised Antenatal Care guidelines (2008) **[B]**. Antenatal diagnosis allows better planning of postnatal care incl surgery to correct cardiac defects	WM Confidential Enquiries [**C]** found 86% of stillbirths with IUGR are avoidable, in part due to inadequate protocols which have adapted to insufficient ultrasound services.
Service implication	Requires additional scanning skill (training), scanning time and equipment; QA important with nuchal scans; proportion of scans need repeating if poor view or outside optimal gestational age window	Additional scanning time and skill required at detailed mid trimester scan; proportion of cases will need to be repeated if not possible to visualise at the time.	Scans for serial monitoring of fetal growth. In cases with suspected growth restriction, additional test is indicated, such as Doppler flow of umbilical artery.
Effect on workload	Will result in increase of 1st trimester workload by 67%, or total of 9,902 more hours of scanning in WM **[1]**	Will result in increase of 2nd trimester scan workload by 53%, or 14,402 more hours of scanning in WM **[2]**	Will result in an increase of 3rd trimester scan workload by 32%, or 7,957 more hours of scanning **[3]**
Estimated effect on performance	Additional 2.3 cases of Down's syndrome detected with 1st trimester screening in a unit with 3000 births p.a. Of these, 31% die by 2nd trimester, i.e. comparative net increase: 1.6 cases / 3000 births **[4]**	Additionally, 1.8/100,000 fewer neonatal deaths because antenatal detection results in better preparation for neonatal surgery for cardiac malformations **[5]**	Additional 2.6 stillbirths with IUGR per 3000 births p.a could be avoided with better protocols, supported by adequate 3rd trimester ultrasound services. **[6]**

Implications for PCT	First trimester screening required to achieve NSC standard. Uptake varies with population 'Combined' test is NSCs preferred option, although reasons not stated.	To be offered to all mothers as part of mid trimester detailed scan	Overall, SGA rate is 12-18%, depending on a number of factors including deprivation. Avoidance of deaths with fetal growth restriction requires implementation of best practice protocols for at-risk pregnancies
Alternatives	Contingency screening successfully piloted in WM; requires nuchal scanning only in about 20% of cases; 80% of mothers can be reassured by a first trimester serum test alone. Performance (detection rate, false +ves) as good or better than combined	Cardiac anomalies may also be identified through neonatal pulse oximetry; current multicentre trial (PI: Andy Ewer, Birmingham Women's Hosp.) will report next year.	Currently none. Research ongoing to improve early pregnancy placental function tests to improve prediction of fetal growth restriction.
Notes	- Routine nuchal scan is labour intensive; - reports of repetitive strain disorder. - Higher detection rate in part due to higher prevalence in 1st trimester & natural attrition - NICE recommendation presumably conditional on resources being available	NICE recommendation presumably conditional on resources being available	CE found many deaths potentially avoidable if better provision of growth scans. RUG has recently agreed a regional best practice protocol which could be implemented as soon as more resources are available.

Explanatory Notes:

1. 1st trimester - routine 12 min scan; assuming 90% of all screening in first trimester and an average of +6 mins, with 15% recall **[A]**
2. 2nd trimester - routine 20 min scan with 10% recall → routine 30 mins scan including outflow tracts, with 15% recall **[A]**
3. 3rd trimester growth scans (15 min): 4.5 scans for high-risk cases (25% prevalence); 0.4 scans per pregnancy for low risk (75%), incl. referrals for fundal height & DFM **[A]**
4. WM data: 7.7 additional cases per 10,000 = 2.3 additional cases detected in unit with 3000 births. NB - Higher detection due to improved test performance as well as higher prevalence of condition in first trimester (attrition between 1st and 2nd trimester approx 31%) **[A]**
5. Outflow tract (OFT) in addition to 4 chamber view: 36% of cardiac anomalies with TGA (transformation of great arteries): estimate 1.8/100,000 fewer neonatal deaths. (NB: NICE estimates another 0.334 /1000 live births with cardiac anomalies due to OFT scan but increasing live birth due to OFT scan is doubtful) **[D]**.
6. WM data: 6/1000 stillbirths or 18 p.a. in unit with 3000 deliveries. 43% are IUGR, excl cong anomalies (BMJ, 2005) → 7.74/3000. Confidential enquiries into SB with IUGR **[C]** reported 86% avoidable. 64% of these deaths were associated with insufficient ultrasound tests/protocols; if only half of these prevented → 2.6 fewer SB/3000 births.

References:

A. Service modeling – routine obstetric ultrasound - West Midlands. www.pi.nhs.uk/ultrasound/modelling.htm
B. NICE Antenatal Care Guidelines 2008 www.pi.nhs.uk/nice/CG62fullguideline.pdf
C. WM Confidential Enquiries into Stillbirths with fetal growth restriction www.pi.nhs.uk/rpnm/CE_SB_Final.pdf
D. NICE Antenatal Care Guidelines 2008, Appendix E, p297 www.pi.nhs.uk/nice/CG62fullguideline.pdf

This information will be presented and discussed in more detail at the forthcoming meeting on
Safe Maternity Ultrasound, Wednesday 29 October 2008 from 1pm at the Perinatal Institute
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