SASUOG

South African Society for Ultrasound in Obstetrics and Gynaecology

Best Practice Guideline for private obstetricians re. Obstetric Ultrasound Scanning and Screening

1. **Inform patients about purpose** of BASIC scan versus DETAIL scan, both T1 and T2

   (ADDENDUM 1 - Patient information leaflet)

   Disclose option of alternative providers depending on patient's wishes/scan needs.

2. Precede scan by risk profile assessment

Patients with an increased risk for fetal anomalies of any kind should be encouraged to accept referral to an ultrasound specialist.

3. Screening

- **a. All patients should be offered screening for T21**
  - i. As a minimum, serum screening is to be offered (preferably at 9-10 (up to 13) weeks or 15-16 (up to 20) weeks)
  - ii. Referral to an FMF-accredited practitioner for NT needs to be offered
    1. For all patients, if practical
    2. For those whose risk on T1 serum screening is higher than 1:1000, if practical
  - iii. NT-based risk calculation must not be used for screening UNLESS assessed by an FMF-accredited practitioner
  - iv. Biochemistry-based risk must NOT be adjusted to a lower risk if the NT appears normal to a non-FMF-accredited practitioner
  - v. Discuss option of NIPT (as per guideline)
- **b. All patients should be offered screening for NTDs**
  - i. On all T2 detail scans, an image must be obtained of the head, including the transventricular plane and the transcerebellar plane, showing normal features and dimensions as shown in the "Basic examination" in GUIDELINES Sonographic examination of the fetal central nervous system: guidelines for performing the 'basic examination' and the 'fetal neurosonogram' *Ultrasound Obstet Gynecol* 2007; 29: 109–116
  - ii. Unless the T2 detail scan is/will be performed by a fetal-medicine-trained practitioner, maternal serum AFP should be assessed (preferably 15-16 weeks) and all patients with a value above 2 MoM for gestation should be offered referral to an expert (level III scan)

c. All patients should be offered screening for structural fetal anomalies

i. All fetal detail scans must be performed according to nationally or internationally accepted guidelines.

ii. Practitioners who are not competent to meet these criteria are advised to disclose this to their patients and refer them to an accredited practitioner UNLESS the patient declines this (and signs a written statement pertaining to this) after being fully informed that the practitioner may not detect severe malformations.

iii. For ANY abnormal findings, referral to an ultrasound specialist is recommended.

4. Content of basic scan (any gestation)

- Measurements for dating and/or growth
- Diagnose multiple pregnancies + Chorionicity
- Rule out placenta praevia
- Assess liquor
- Assessment of uterus and adnexal structures

5. Content of T1 detail scan (ADDENDUM 2)

One of the exisiting guidelines needs to be followed for the first trimester detail scan. *See:* ***ISUOG Practice Guidelines: performance of first-trimester fetal ultrasound scan.*** *Ultrasound Obstet Gynecol* 2013; 41: 102–113; For a T1 detail scan incl. NT between 11 and 14 weeks. *See: https://fetalmedicine.org/nuchal-translucency-scanps://fetalmedicine.org/nuchal-translucency-scan*

- Ideal gestation 11-13+6w
- Measurements: CRL, BPD
- NT, NB, DV, TR: only with FMF accreditation and according to FMF criteria
  If not accredited but all look normal: DO NOT reduce biochemistry-based risk
  If not accredited but one of these looks abnormal: REFER ASAP
- ***Recommended images to keep:***
  - CRL with bladder and stomach
  - BPD
  - AC, cord insertion
  - Two arms, two legs, straight spine (coronal)
  - If NT-based T21 risk assessment: Midsagittal profile incl. NT, NB, IT
  - If twins: T- or Lambda sign

6. Content of T2 detail scan (ADDENDUM 3)

The ISUOG guideline needs to be followed for a mid-trimester detail scan. ***Practice guidelines for performance of the routine mid-trimester fetal ultrasound scan*** L. J. SALOMON *et al* on behalf of the ISUOG Clinical Standards Committee *UOG 2011;37:116 - 126*

See also the "Basic examination" in ***GUIDELINES Sonographic examination of the fetal central nervous system: guidelines for performing the 'basic examination' and the 'fetal neurosonogram'.*** *Ultrasound Obstet Gynecol* 2007; 29: 109–116 AND ***ISUOG Practice Guidelines***

(updated): sonographic screening examination of the fetal heart. *Ultrasound Obstet Gynecol* 2013; 41: 348–359

- Ideal gestation 18-20+6w
- Gestational age must not be changed on subsequent scans
- Measurements: BPD, HC, AC, FL, atrium, TCD, CM, NF
- Any abnormal finding by a generalist should preferably be referred

- **Soft aneuploidy markers**
  For an anomaly scan to qualify as a "genetic" or "soft marker" scan, the following should be included, in addition to the full fetal biometry and anatomy ("detail scan"): humerus length, nasal bone length, assessment of the facial profile on a perfect mid-sagittal view for micrognathia, nuchal fold measurement (must be < 6mm at 20w), renal pelvis diameter (must be < 5mm at 20w), rule out echogenic focus (and ARSA if possible), ensure both hands open fully, ensure offsetting of the AV-valves at the crux of the heart. This is usually not useful after prior NIPT or after prior T1 combined risk assessment by an expert resulting in a very low risk. In all other situations, refer if any marker detected.
- ***Recommended images to keep:***
  - BPD, atrium, TCD
  - AC, FL
  - 3-vessel cord
  - Face profile
  - Transverse palate
  - Sagittal spine incl. sacral upsweep
  - Transverse two kidneys
  - Abdominal cord insertion
  - 4-chamber view, 3-vessel view
  - Soft markers

7. T3 growth scan

- Measurements: BPD, HC, AC, FL, EFW (Hadlock)
- Interpretation of concordance
- Interpretation of size (Salomon or INTERGROWTH-21st)
- Interpretation of liquor volume
- UA RI and MCA PI if any suggestion of suboptimal growth (refer if not skilled)

8. Write complete report on ALL scans (ADDENDUM 4 and 5 - suggested templates for basic, detail, T1 and T2)

- Measurements must be recorded in mm and interpreted according to accepted graphs.

- For the sake of greater uniformity, it is recommended to use Robinson or INTERGROWTH 21st for interpretation of CRL, Chitty, INTERGROWTH 21st or WHO for BPD, HC, AC and FL; and WHO, INTERGROWTH 21st or Salomon for EFW (EFW calculated with formula of Hadlock). Practitioners using other graphs should preferably disclose this on their reports.

9. **Referral indications in T1 or T2** – this will depend on the expertise of the managing obstetrician and the availability of a level II unit
    - Family history of a first degree relative with a congenital defect or genetic disorder
    - Three or more first trimester miscarriages
    - Pre-existing metabolic disease (Diabetes, Phenylketonuria);
    - Teratogen exposure (Retinoids, Phenytoin, Carbamazepine, Sodium valproate, Lithium carbonate, MTX);
    - Screen high risk (>1:300) for the common trisomies
    - Nuchal translucency > 3.5mm or abnormal ductus venosus flow in T1
    - (Suspected) fetal anomaly incl. nuchal edema (> 6mm), ventriculomegaly (> 10mm)
    - Echogenic bowel or intra-fetal calcifications other than intracardiac echogenic focus
    - Monochorionic twin pregnancy or unknown chorionicity
    - Dichorionic twin pregnancy with discordant growth > 20%
    - Placental abnormalities (hydropic, "jelly-like", "moth-eaten", tumour)
    - Olighohydramnios (Deepest pool < 2cm)
    - Polyhydramnios (Deepest pool > 8cm)
    - Specific maternal infections (Parvovirus B19, Rubella, Coxsackie, Toxoplasmosis, CMV)
    - Significant titers of anti-red cell antibodies

10. Criteria for equipment

For detail scans:

- Not older than 10 years
- Curvilinear transducer
- 2-5 MHz
- Obstetric measurement programme
- Robinson, Chitty for biometry or INTERGROWTH-21st
- Hadlock for EFW or INTERGROWTH-21st

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ADDENDUM 1 - Patient information leaflet

As per SASOG BetterObs Prenatal tests leaflet and consent form

ADDENDUM 2: Content of T1 detail scan

- Measurements: CRL, BPD

	Normal	Abnormal	Take Note
Spine	Intact vertebral column and skin Intracranial translucency present and normal	Spina Bifida Kyphoscoliosis	Sagittal view Coronal view
Head	Skull bones ossified Falx present Choroid plexus butterfly shape Measure BPD, (HC)	Anencephaly Holoprosencephaly	Transverse section
Face	Nasal bone present Two orbits Retronasal triangle	Absent/ hypo-plastic nasal bone	Ethnic differences
Heart	Four chambers V-sign Heart rate If accredited: check DV and TV flow	Negative A-wave DV TR	Use colour
Abdomen	Stomach left side Intact anterior wall Measure AC 2 perivesical vessels Bladder length Kidneys	Absent/ right side Omphalocoele® Gastroschisis * SUA Megacystis (> 7mm)	 Beware: Physiological gut herniation (9-12w) Use colour Sagittal Coronal section (optional)
Limbs	2 arms/legs/hands/feet Measure FL	Missing limbs	

®Omphalocoele at CRL > 45mm with bowel and liver involvement

*Gastroschisis should only be diagnosed at CRL > 68mm.

Recommended images to keep:

- CRL with bladder and stomach
- BPD
- AC, cord insertion
- Two arms, two legs, straight spine (coronal)
- If NT-based T21 risk assessment: Midsagittal profile incl. NT, NB, IT
- If twins: T- or Lambda sign

ADDENDUM 3: Content of T2 detail scan Ideal gestation 18w0d-20w6d

- All standard planes and measurements should be made according to ISUOG guidelines
- Gestational age must not be changed on subsequent scans
- Measurements: BPD, HC, AC, FL, (HL), atrium, TCD, CM, NF, (NB), (PNT)

	Landmarks	**Measurements**
Head and Neck	Intact ovoid cranium Ossification of skull bones Cavum septi pellucidi Falx in midline, reaching the occiput Thalami symmetrical Cerebral ventricles Cerebellum Cisterna Magna Nuchal fold Neck masses or cystic hygroma	BPD, HC Atrium width (inner to inner) Trans-cerebellar diameter (outer to inner) (outer to outer)
Face	Two orbits, spacing Palate intact Upper lip intact Facial profile – assess chin size Nasal bone present Facial skin	IOD and EOD if suspected hyper- or hypotelorism (transverse view) (coronal view) Nasal bone length Pre-nasal thickness
Chest Heart	Four chamber Position in chest Heart rate, regular Chambers balanced Off-setting of valves, both moving No pericardial effusion Septum intact Flap foramen ovale left Outflow tracts: L and R including valve motion Three vessel view Exclude diaphragmatic hernia	(apical view) 45° deviation to left 120- 160 bpm (2mm) (lateral view, colour)
Abdomen	Stomach present, on left, size Diaphragm Bowel - Not dilated Bowel echogenicity Two kidneys Bladder	 (parasagittal view) compare to iliac wings AP diameter of pelvis
Umbilical cord	Cord insertion – abdominal wall integrity Three vessels Cysts	 (Colour flow Doppler at level of bladder; transverse view)
Spine	Exclude hemi-vertebra and spina bifida Cervical, Thoracic, Lumbar and Sacral: “up sweep” in sagittal view; tapering in coronal view	Check in sagittal and transverse planes
Extremities	Twelve long bones, straight and well ossified	Humerus and Femur lengths

	Presence of hands and feet Open hands – 5 fingers Exclude talipes Plantar view of feet – 5 toes, no gap	(lateral view)
Placenta	Position Relation to internal cervical os* Vasa praevia Accessory lobes Grannum	Anterior, posterior, fundal or lateral RCOG Guideline for placenta praevia
Amniotic fluid	Liquor volume Polyhydramnios ** Oligohydramnios ***	Deepest vertical pool (< 24w or twins) or amniotic fluid index
Gender	Male or female	Optional Evaluation of multiple gestations

*__Placental location__ should be reported correctly - RCOG Guideline on low lying placenta: If placenta within 20 mm of internal os at 18 to 20 week scans - Confirm with Trans vaginal ultrasound:

- If covering os: rescan 28 to 32 weeks
- Reaching os: rescan 32 weeks
- If not reaching os but within 20 mm of os: rescan if vaginal bleeding

**__Polyhydramnios (AFI > 25cm; MVP >8cm in twins or early):__

- Careful check for structural and/or markers for aneuploidy
- Screen for gestational Diabetes
- Do TVS for cervical length

If any fetal abnormality detected / SGA fetus / AFI > 30 cm: Refer / Consider invasive testing and close follow-up.

*** **Oligohydramnios (AFI < 5cm; subjective if early MVP <2cm):** Always confirm presence of normal kidneys, bladder filling, history of SROM and UA Doppler

Recommended images to keep:

- BPD, atrium, TCD
- AC, FL
- 3-vessel cord
- Face profile
- Transverse palate
- Sagittal spine incl. sacral upsweep
- Transverse two kidneys
- Abdominal cord insertion
- 4-chamber view, 3-vessel view
- Soft markers

ADDENDUM 4 – BASIC Scan Report

Doctor: ……. Date: ……. Patient: ……..				
Ultrasound Report BASIC SCAN *(please tick boxes or fill in numbers)*				
Intrauterine	Yes	No		
Number of fetuses	……			
Heartbeat	Yes	no		
Fetal movements	Yes	No		
Fetal lie	Cephalic	Breech	Transverse	Oblique
Placenta	Anterior	Posterior	Lateral	
	High	Low		
	Distance from os if low		……mm	
Cord	3 vessels	2 vessels	Abnormal	……
Liquor	Normal	Reduced	Increased	
	If abnormal: AFI or DVP		……cm	
Biometry	**Concordant**		**Discordant**	
CRL	……mm	**AC**	……mm	
BPD	……mm	**FL**	……mm	
HC	……mm	**HL**	……mm	
EFW	……g			
Mean GA	……w……d			
Growth	adequate	inadequate	not applicable	
Comments				

ADDENDUM 5 – DETAIL Scan Report

Date: ……

Doctor: ……

Patient: ……

Ultrasound Report DETAIL SCAN *(please tick boxes or fill in numbers)*

Risk Profile	low	high	**Scan level**	basic	detail
Anatomy	***Normal N***	***Abnormal AbN***	***Not seen NS***		

BPD plane	Chest	Spine
Ventricular plane	4-CV	12 long bones
TCD plane	Outflows	Distal limbs
Eyes transverse	AC plane	Gender
Palate transverse	Abdominal wall	

Dopplers (if indicated)

Umbilical art.	RI	PI	N	> p95	AREDF
Uterine art	mean PI		N	AbN	
MCA	PI		N	AbN	
	Vmax	cm/s	N	AbN	
DV	PI		N	AbN	

Comments

Normal Major AbN Markers SGA Risk T21 1/

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