University Hospitals of North Midlands NHS
NHS Trust

Achieving Sustainable Quality in Maternity Services

ASQUAM

Guideline for Suspected Large for Gestational Age (LGA) and/or polyhydramnios

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Ratified by:	Guideline meeting (Maternity forum sub-group)
Author:	Consultant Obstetrician Midwife

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VERSION CONTROL SCHEDULE			
Version	**Date**	**Author**	**Comments**
1	2012 (March)		Large for gestational age guideline first implemented
1	2014 (November)	[redacted] [redacted] 5th Year Medical Student [redacted] Consultant Obstetrician [redacted] Consultant Obstetrician	Polyhydramnios guideline first implemented
2	2015 (August)	Reviewed by [redacted] Consultant Obstetrician	Full review undertaken
The above guidelines have been amalgamated.			
3	2020 (September)	Reviewed by [redacted], Consultant Obstetrician and Gynaecologist [redacted] Midwife	Full review undertaken

1. PURPOSE OF THE GUIDELINE

The aim of this guideline is to provide information to medical and midwifery personnel regarding the management and follow up of women at risk of and/or presenting with suspected large for gestational age babies and/or polyhydramnios at the UHNM. The information presented in this guideline takes into account the current evidence regarding this topic.

This guideline is to be read in conjunction with the following ASQUAM guidelines:

- **Induction of labour**
- **Guidelines for Care of Women with Body Mass Index (BMI) ≥35 during Pregnancy, Delivery and Postnatal Period**
- **Diabetes in pregnancy**
- **Caesarean section**
- **Guideline for the Screening, Investigation and Management of the Small for Gestational Age Fetus and Fetal Growth Restriction**

2. BACKGROUND

2.1 Definitions

Large for gestational age (LGA) refers to a suspected macrosomia in pregnancy and will be the term used instead. The thresholds used to define LGA antenatally will be;

- Symphysio-fundal height (SFH) >90th Centile for gestation
- Abdominal circumference (AC) >95th centile for gestation
- Estimated fetal weight (EFW) >95th centile for gestation

Macrosomia is a definition based on neonatal birthweight, therefore a fetus cannot be defined as macrosomic until it is born.[1] The commonly used cut-off is 4500g.

Polyhydramnios is defined by ultrasound scan (USS).[2] The vertical measurement of the deepest pocket (DVP) of amniotic fluid free of fetal parts is used to classify polyhydramnios into:

- mild (8–11 cm),
- moderate (12–15 cm)
- severe (≥16 cm)

2.2 Risk factors for macrosomia[3]:

- Pre-pregnancy maternal obesity (Booking BMI ≥30)
- Multiparity (≥5)
- Previous pregnancy resulting in neonatal macrosomia
- Pre-existing diabetes / gestational diabetes

2.3 Risks and complications associated with fetal macrosomia:

Fetal macrosomia is associated with an increased risk of maternal and neonatal complications[4].

Maternal complications include an increased risk of:

- Emergency caesarean section (CS)
- Instrumental delivery
- Postpartum haemorrhage (PPH)
- Perineal trauma (increased risk of third or fourth degree tears).

Neonatal complications include increased risk of:

- Shoulder dystocia resulting in brachial plexus injury
- Fracture of clavicle or humerus
- Birth asphyxia.

2.4 Incidence and causes of polyhydramnios:

The incidence of polyhydramnios ranges from 0.93% to 2%, [5,6,7] of which two thirds of cases are mild to moderate and one third are severe polyhydramnios.[5] Clinically, polyhydramnios may be acute or chronic, however acute polyhydramnios is less common with an estimated incidence of 1 in 3888.[8]

The causes of polyhydramnios can include maternal and fetal conditions. About two-thirds of polyhydramnios cases are idiopathic and one-third associated with underlying pathology.[5] In general, fetal anomalies are those which either result in fetal polyuria or reduced swallowing of amniotic fluid by the fetus. Other well known causes of polyhydramnios include maternal diabetes mellitus and multiple pregnancy, particularly monochorionic monozygous twins, with acute polyhydramnios at 16-22 weeks mainly seen in association with twin-to-twin transfusion syndrome.[8]

Table 1 Causes of Polyhydramnios:

Idiopathic (unknown)	60% of cases will fall into this category
Maternal conditions	Diabetes mellitus
Fetal anomalies	Structural malformations: ▪ Gastrointestinal atresia or obstruction ▪ Abdominal wall defects ▪ Neural tube defects Aneuploidies Neuromuscular disorders
Multiple pregnancy	Monochorionic monozygous twins (twin-to-twin transfusion syndrome)
Combined disorders	▪ Rhesus isoimmunisation ▪ Congenital infections ▪ Congenital anaemia
Fetal causes	▪ Structural inhibition of swallowing such as tracheo-oesophageal fistula, oesophageal or duodenal atresia ▪ Diaphragmatic hernia or obstruction of the gastrointestinal tract ▪ Neurological inhibition of swallowing Less common causes include: ▪ Severe fetal anaemia usually due to isoimmunisation or fetal-maternal haemorrhage ▪ Congenital viral infections. [9,10]

2.5 Risks and complications associated with polyhydramnios:

Polyhydramnios has an increased risk of perinatal morbidity and mortality. [11,12] However the prognosis usually depends on the underlying cause, and most pregnancies complicated by unexplained polyhydramnios have a normal outcome.[11] Polyhydramnios whether idiopathic or not, is associated with prematurity, low birth weight and perinatal death.[12] It is also a risk factor for umbilical cord prolapse at rupture of membranes,[13] and for the mother; polyhydramnios increases the risk of postpartum haemorrhage.[14]

3. RECOGNITION AND ANTENATAL MANAGEMENT OF LARGE FOR GESTATIONAL AGE (LGA)

Despite best efforts, there remains a lack of an accurate method to predict neonatal macrosomia in a suspected LGA pregnancy antenatally. Recent studies demonstrate that ultrasound is significantly better than symphysio-fundal height (SFH) in predicting LGA neonates. A large multicentre study[15] showed that ultrasound assessment of Estimated Fetal Weight (EFW) detected a significantly higher proportion of LGA neonates with fetal macrosomia (>4500g), based on ultrasound scan between 37 and 41 weeks of gestation, compared with SFH alone. These results are logical, despite the relatively large margin of error, as there is a degree of objectivity in assessing fetal biometry using ultrasound scan as opposed to the subjectivity of clinical examination.

There is further evidence to suggest that combined screening using maternal demographics (booking BMI, parity and previous history) and fetal biometry performed at 19–24, 30–34 and 35–37 weeks of gestation improves the prediction of macrosomic babies.

3.1 Management of Women With A Suspected LGA Fetus

Women with risk factors for fetal macrosomia (see section 1) should be identified at booking visit.

- USS should be arranged at 35-37 weeks; if LGA is suspected at that scan (i.e. EFW >95th centile), then pregnancy should be managed as per suspected LGA as below.
- If the woman is already on an existing care pathway (such as BMI>35 or diabetes), then USS at the above gestations should be included and management accordingly.

LGA detected at 24-35^{+6} weeks gestation

- If the symphysial-fundal height (SFH) is >90th centile on routine measurements then an ultrasound scan for fetal biometry should be arranged for the next available routine appointment if the woman does not already have one arranged.
- If the EFW ≤95th centile then the woman can return to routine care. If the growth trajectory on SFH remains the same, even though it is above the 90th centile a repeat scan is not indicated. If the growth trajectory on SFH changes (rises or falls) then these women will require a repeat growth scan.
- If EFW >95th centile on USS:

    - A Glucose tolerance test (GTT) should be arranged as soon as possible.
    - if a GTT has been performed at an earlier gestation, consideration should be made regarding whether a repeat test is necessary. The decision should be made by a senior registrar or consultant taking into account any other evidence of development of diabetes, for example glycosuria.

- If the GTT is positive refer to the specialist diabetic team.
- Care in labour and postnatally as per gestational diabetes guideline.

LGA detected at 36-40 weeks gestation

- If SFH is >90th centile for the first time on routine measurements then a routine ultrasound scan for fetal biometry should be arranged.
- If EFW ≤95th centile then the woman can return to routine care.
- If EFW >95th centile:

    - Review by medical team and referral for home blood glucose monitoring and review of results.

- If blood sugar monitoring is positive, then refer to the diabetic specialist team. Care in labour and postnatally as per gestational diabetes guideline.
- If negative refer to consultant for review of further care and management. In women who have other risk factors in addition to the LGA fetus, for example a previous caesarean section, care should be individualised regarding the timing and mode of delivery.

4. RECOGNITION AND ANTENATAL MANAGEMENT OF POLYHYDRAMNIOS

4.1 Recognition of polyhydramnios

On examination, recognition of a large fundal size remains key to diagnosis. If there is excessive growth (defined as a steeper curve than any curve on the customised growth chart) or a clinical suspicion of polyhydramnios, an ultrasound scan should be arranged. If polyhydramnios is demonstrated, then a referral to the antenatal clinic at either the County Hospital or the Royal Stoke Hospital should be made.

Some women may be symptomatic and experience e.g. persistent shortness of breath or excessive uterine activity and should be referred to the maternity assessment unit acutely or antenatal clinic on ultrasound diagnosis.

For the definitive diagnosis, ultrasound scanning should be used with objective measures to estimate the amniotic fluid volume.

At UHNM, DVP >8cm is used to identify polyhydramnios.

4.2 Management of polyhydramnios

Initial management of polyhydramnios**:**

If polyhydramnios is confirmed on ultrasound, the sonographer at County Hospital or Royal Stoke Hospital should check the images for the following features in order to screen for various fetal causes (This is an option under the overall diagnosis on ViewPoint):

- Four chamber view of the heart
- Upper lip of the face (cleft lip)
- Stomach (size, position, 'double bubble')

If the sonographer obtains clear views of the anatomy, i.e. the heart, face and stomach then there is no need to refer to fetal medicine UNLESS

- EFW <5th centile or
- clear views of the anatomy cannot be obtained or
- DVP ≥12 cm (this correlates with the increased severity that is thought to be linked to increased perinatal risk, although the evidence base on this is inconsistent).

If any abnormality is suspected, this should prompt an additional ultrasound scan with a consultant in fetal medicine for a detailed structural assessment and measurement of the middle cerebral artery.

The following blood tests should be arranged:

- Oral glucose tolerance test when next available (unless >28 weeks and already performed) if <36 weeks. Refer for home blood glucose monitoring if 36-40 weeks.

- Maternal infection screen: toxoplasmosis, parvovirus, cytomegalovirus (CMV) and Rubella.[16]
- Check maternal antibody screening result.[16]

Amniocentesis for fetal karyotype

Polyhydramnios is associated with an increased incidence of fetal chromosomal anomalies particularly when seen at gestations less than 28 weeks or where fetal growth restriction is evident. However in a fetus that appears normal on ultrasound, the risk of fetal aneuploidy is low (less than 1%[17]) therefore fetal karyotyping should not be routinely offered. However, in presence of intrauterine growth restriction or with structural anomalies identified on ultrasound scan consider amniocentesis for fetal karyotype.[18,19]

Antenatal care once polyhydramnios is confirmed on USS:

Serial ultrasound scans assessing the amniotic fluid volume and fetal growth should be performed every 4 weeks, once polyhydramnios has been diagnosed. There is no value in scanning more than once a month. High risk women will also need regular review in the antenatal clinic (ANC) at the County Hospital or the Royal Stoke Hospital.

If DVP ≥12 cm on subsequent monitoring, refer to fetal medicine team.

Over half of women with idiopathic polyhydramnios who are asymptomatic may resolve spontaneously.[20] If idiopathic polyhydramnios resolves spontaneously, then the woman can be returned to routine care as per existing pathway.

However, if symptoms develop e.g. excessive uterine activity or persistent shortness of breath, delivery or medical/ surgical interventions (such as amnioreduction, or the use of non-steroidal anti-inflammatory drug) may be indicated after discussion with a fetal medicine specialist.

5. PLANS FOR DELIVERY

Suspected LGA on USS at 36-40 weeks

Evidence:

A Cochrane systematic review[20] comparing induction of labour with expectant management of suspected LGA babies on USS demonstrated a 40% reduction in the risk of shoulder dystocia (RR 0.60, 95% CI 0.37–0.98) and an 80% reduction in risk of fractures (RR 0.20, 95% CI 0.05–0.79), but there was no significant difference in the rate of CS, instrumental delivery, brachial plexus injury or birth asphyxia. There was an increase in the risk of third- and fourth-degree tears, but this could be estimated in only one study.

A further systematic review and meta-analysis[21] evaluating the impact of a policy of induction of labour (IOL) versus expectant management on the rate of CS in pregnancies with suspected macrosomia in nondiabetic women, revealed no significant difference in the risk of emergency CS or any adverse maternal or neonatal outcome. However, an 83% reduction in the risk of fractures, was reported.

Management:

- Discuss risks associated with suspected macrosomia and benefits of induction over expectant management.
- Offer induction of labour and information leaflet (as per induction guideline).
- Induction of labour may therefore be offered between 38 and 39 weeks depending on the degree of suspected macrosomia and the preferences of the woman.
- Document discussion and agreed management in K2.

Non-diabetic and EFW ≥5000 g on USS at 36-40 weeks

Management:

- Discuss risks associated with vaginal delivery and benefits of elective caesarean section over vaginal delivery.
- Offer elective CS and information leaflet (as per caesarean section guideline).
- Arrange date and pre-admission preparations.
- Document discussion and agreed management in K2.

Diabetic and EFW ≥4500g

Management:

- Elective caesarean section is the preferred mode of delivery. The woman should be managed in the diabetic ANC as per guidance.

Polyhydramnios persisting

Evidence (see section 2.5: Risks and complications associated with polyhydramnios)

Management:

- Inform the woman of the risks of preterm labour, cord prolapse and unstable lie.
- Offer patient information leaflet on polyhydramnios.
- Consider induction of labour (IOL) from 38 weeks gestation. This should be discussed with the consultant responsible, agreed with the woman and discussions documented in K2.

6. MONITORING AND AUDIT

The need to monitor/audit the standards set out below will be considered alongside other Directorate requirements and prioritised accordingly. The Directorate Clinical Audit programme is drafted by the Directorate Clinical auditor, in liaison with clinical staff, and approved by the Directorate.

Element to be monitored	Lead	Tool	Frequency	Reporting arrangements	Acting on recommendations and lead(s)	Change in practice and lessons to be shared
Guideline content	Guideline Co-ordinator	Guideline Review	Every three years	Maternity Forum Subgroup: Guideline Meeting	Required changes to practice will be identified and actioned with the release of the updated guideline.	Required changes to practice will be identified and actioned with the release of the updated guideline.
Clinical standards within guideline	Directorate Clinical Auditor	Clinical Audit	As required in relation to other Directorate priorities	Directorate Business, Performance and Clinical Governance Meeting	Required actions will be identified and completed in a specified timeframe as per the audit action plan.	Required changes to practice will be identified and actioned within a specific timeframe as per the audit action plan and, in addition, lessons will be shared with relevant stakeholders as per audit action plan.

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Flowchart 1 - Antenatal Pathway For The Diagnosis And Management Of The Large For Gestational Age (LGA) Fetus In Pregnant Women Without Known Diabetes

At booking visit

Risk factors for LGA?
- Booking BMI≥30
- Multiparity≥5
- Previous neonatal macrosomia(BW>4500g)
- Pre-existing diabetes

Y → Arrange a repeat ultrasound scan and review at 35-37 weeks gestation if not already included in management pathway.

24-35^{+6} Weeks

Symphysial-fundal height (SFH) > 90th centile?

(No SFH required if serial growth scans are indicated)

Y → Arrange next available routine ultrasound scan (USS) for biometry and liquor volume.
If polyhydramnios present, see polyhydramnios guideline.

EFW > 95th centile on scan biometry?

N → Back to routine care. Repeat USS only indicated if growth trajectory on SFH changes.

Y

Arrange:
- GTT next available. Consider repeat if previously normal.
- Repeat USS and review at 36 weeks gestation (if previous USS is ≥ 34 weeks, consider if a repeat USS is necessary, clinical assessment may be adequate).
- If the fetus remains LGA consider the offer of IOL at 38-39 weeks or Caesarean section if EFW >5000g.

36-40 Weeks

Symphysial-fundal height (SFH) > 90th centile for the first time?

Y → Arrange next available routine USS for biometry.

EFW > 95th centile on scan biometry?

N → Back to routine care.

Y →
- Offer IOL between 38 to 39 weeks
- Refer to DSN for home blood glucose monitoring
- Consider caesarean section if EFW > 5000g

Flowchart 2 - Antenatal Pathway for the Diagnosis and Management of Polyhydramnios in Women with a Singleton Pregnancy

Symphysial-fundal height (SFH) >90th centile for gestation?

Book next available routine scan for biometry and liquor volume.

Definition of polyhydramnios using Deepest Vertical Pool (DVP):
- **Mild (DVP 8-11cm)**
- **Moderate (DVP 12-15cm)**
- **Severe (DVP ≥16cm)**

EFW <5th Centile with DVP ≥ 8cm → Liaise with a fetal medicine specialist.

EFW > 95th centile on scan with normal liquor volume or mild polyhydramnios (DVP<12cm). → Follow LGA pathway.

Normal biometry and normal AFI? → Back to routine care. Repeat USS only indicated if growth trajectory changes.

Normal biometry with DVP ≥8cm.

Investigate:
- Glucose tolerance test (GTT) next available (unless >28 weeks and already performed) if <36 weeks; refer to DSN for home blood glucose monitoring if 36-40weeks.
- Infection screen – parvovirus, toxoplasmosis, CMV and rubella.
- Sonographer to check the following features:
  - 4 chamber view of heart.
  - Upper lip of the face (cleft lip)
  - Stomach (size, position, 'double bubble')
- Check maternal antibody screen result.

Infection screen positive OR anomaly present OR DVP ≥12cm

N

- 4 weekly with USS for fetal biometry and liquor volume and review in ANC.
- Inform woman of risks of preterm labour, cord prolapse and unstable lie.
- Offer woman information leaflet on polyhydramnios.
- Refer to fetal medicine if DVP ≥12cm
- If polyhydramnios resolves, return to routine care.
- Consider IOL from 38 weeks gestation if polyhydramnios persists.

Y

Refer to fetal medicine specialist.