



## MEMO

**To:** Obstetrical care providers, BCW MAP US reporting MDs, sonographers and clerical staff

**RE:** **Large for gestational age (LGA) fetus**

**From:** Dr Chantal Mayer, Medical lead BCW Ultrasound

**Date:**

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### What is changing?

BC Women's Obstetrical Ultrasound department does not currently have a standard definition for "large for gestational age" (LGA).

Starting **November 6 2023**, The Obstetrical ultrasound department at BCW will be using an **estimated fetal weight (EFW) at the 97.5<sup>th</sup> %ile using WHO fetal growth chart or greater for gestational age to identify fetuses at risk for macrosomia.**

### Why is this change happening?

There is no widely accepted definition in the literature for what constitutes a "large for gestational age" fetus. However, consistency in reporting is desirable as identification of an LGA fetus may inform management in some cases.

### Background and justification:

Proposed thresholds for identification of LGA fetus use either fetal AC, EFW or birth weight with EFW > 90<sup>th</sup> %ile as the most commonly cited cut off (1,2) (appendix 1).

While EFW > 90<sup>th</sup> %ile is most commonly cited as cut off but an associated increased morbidity in absence of coexisting comorbidity has not been clearly documented to support use of this specific cut off. Similarly, data suggesting an increased risk for stillbirth in LGA fetuses in the absence of comorbidity such as pre-existing or gestational diabetes is lacking (3).

Identification of potentially large for gestational age fetus by ultrasound is clinically relevant under the following circumstances:

1. To identify otherwise uncomplicated pregnancies at risk for macrosomia who might benefit from IOL at term:

Those are where the fetus has an estimated fetal weight (EFW) on obstetric ultrasound >95th percentile by Hadlock formula for gestational age (3500g at 36 weeks, 3700g at 37 weeks, and 3900g at 38 weeks) -see [BCW policy](#).

2. To identify otherwise uncomplicated pregnancies with fetal EFW>5000g which may benefit from fetal monitoring (4) or elective caesarean section due to increased risk of morbidity/mortality (1).
3. To identify pregnancies with possible overgrowth syndrome: while these are rare, suspicion is informed by the presence of coexisting ultrasound findings (eg omphalocele/organomegaly), and/or disproportionate biometric findings (eg macrocephaly).

**Identification of LGA fetus at risk for macrosomia: should we use a threshold based on abdominal circumference (AC) measurement or estimated fetal weight (EFW)?** Given that clinical recommendations for fetuses large for gestational are based on EFW, identification of at-risk fetuses should be informed by EFW measurement.

**Should we routinely differentiate between, and report symmetric and asymmetric macrosomia?**

This is not currently recommended since this practice is not supported by current guidelines, definitions of what exactly constitutes symmetric versus asymmetric growth are lacking and there is no evidence that this should inform management.

**What threshold should we use to identify fetuses at risk for developing macrosomia ( $\geq 4000$ g) at term?**

A threshold of EFW 97<sup>th</sup> %ile for gestational age has been proposed as opposed to 90<sup>th</sup> %ile based on increased morbidity identified with a cut off of 97<sup>th</sup> %ile (4,5).

The [BCW IOL](#) for macrosomia is based on the 2015 RCT which compared perinatal outcomes of IOL to expectant management for suspected macrosomia (6). The trial used a cut off EFW at the 95<sup>th</sup> %ile by Hadlock chart for gestational age of 36 weeks or greater. The Haldlock 95th percentile cut offs are equivalent to EFW 97.5<sup>th</sup> % ile using WHO growth chart. (see Appendix B).

Accordingly, a threshold of EFW >97.5%ile by EHO chart has been chosen to identify “large for gestational age” fetuses at risk for macrosomia

**What should clinicians keep in mind: limitations associated with using EFW to predict birth weight/ macrosomia:**

**EFW in large fetus has limited accuracy.** Hadlock is the most commonly used formula for EFW calculation and that used by WHO has an approximate 55% sensitivity and 95% specificity for a birth weight of 4000g (70).

A recent study using EFW calculated by the Hadlock formula, and EFW percentiles per the Hadlock chart, found that accuracy decreased and overestimation increased with increasing EFW (8). Another recent study offered similar findings with accuracy defined as birth weight within 10% of EFW in 78% of the AGA fetus but only 68% in the LGA fetus (9).

**EFW alone has limited ability to predict perinatal morbidity:** A 2020 systematic review assessed the performance of EFW >90<sup>th</sup> percentile for GA or >4000g and AC>36cm (or >90<sup>th</sup> percentile). Both thresholds had a >50% sensitivity for predicting macrosomia at birth with positive LR of 8.7 and 7.6 respectively. A EFW >4000g (or 90<sup>th</sup> percentile) had a 22% sensitivity at predicting shoulder dystocia (LR 2.2) (7).

Clinicians should consider EFW along with other risk factors such as advanced maternal age, maternal obesity, and pre-existing, or gestational diabetes when assessing the pregnancy's risk for adverse outcomes (1).

#### References:

1. Macrosomia. ACOG Practice Bulletin, Number 216. Obstetrics & Gynecology 135(1):p e18-e35, January 2020. | DOI: 10.1097/AOG.0000000000003606
2. ISUOG Practice Guidelines: ultrasound assessment of fetal biometry and growth. Ultrasound Obstet Gynecol 2019; 53: 715–723
3. Stephen Wood & Selphee Tang (2020) Stillbirth and large for gestational age at birth, The Journal of Maternal-Fetal & Neonatal Medicine, 33:12, 1974-1979, DOI:10.1080/14767058.2018.1534229
4. H Xu, F Simonet, Z-C Luo. Optimal birth weight percentile cut-offs in defining small- or large-for-gestational-age. Pædiatrica/Acta Pædiatrica 2010 99, pp. 550–555
5. Sheree L. Boulet, MPH, Greg R. Alexander, RS, MPH, ScD, Hamisu M. Salihu, MD, PhD, and MaryAnn Pass, MD, MPH Macrosomic births in the United States: Determinants, outcomes, and proposed grades of risk. Am J Obstet Gynecol 2003;188:1372-8.
6. Michel Boulvain, Marie-Victoire Senat, Franck Perrotin, Norbert Winer, Gael Beucher, Damien Subtil, Florence Bretelle, Elie Azria, Dominique Hejaiej, Françoise Vendittelli, Marianne Capelle, Bruno Langer, Richard Matis, Laure Connan, Philippe Gillard, Christine Kirkpatrick, Gilles Ceysens, Gilles Faron, Olivier Irion, Patrick Rozenberg, for the Groupe de Recherche en Obstétrique et Gynécologie (GROG). Induction of labour versus expectant management for large-for-date fetuses: a randomised controlled trial. Lancet 2015; 385: 2600–05
7. Moraitis AA, Shreeve N, Sovio U, Brocklehurst P, Heazell AEP, Thornton JG, et al. (2020) Universal third-trimester ultrasonic screening using fetal macrosomia in the prediction of adverse perinatal outcome: A systematic review and meta-analysis of diagnostic test accuracy. PLoS Med 17(10): e1003190. <https://doi.org/10.1371/journal.pmed.1003190>

8. Song J, Liu J, Liu L, et al. The birth weight of macrosomia influence the accuracy of ultrasound estimation of fetal weight at term. J Clin Ultrasound. 2022; 50(7):967-973. doi:10.1002/jcu.23236

9. Mozas-Moreno, J.; Sánchez-Fernández, M.; González-Mesa, E.; Olmedo-Requena, R.; Amezcua-Prieto, C.; Jiménez-Moleón, J.J. Perinatal and Maternal Outcomes According to the Accurate Term Antepartum Ultrasound Estimation of Extreme Fetal Weights. J. Clin. Med. 2023, 12, 2995. <https://doi.org/10.3390/jcm12082995>

**APPENDIX A: Guidelines LGA definitions:**

Source	Cited LGA definitions
<a href="#">ACOG #216 “Macrosomia”, 2020</a>	birth weight >90 <sup>th</sup> %ile for gestational age as commonly used
<a href="#">RANZOG third trimester fetal growth scan template 2019</a>	EFW>90 <sup>th</sup> %ile
<a href="#">ISUOG Guideline 2019: ultrasound assessment of fetal growth</a>	EFW/ AC >90 <sup>th</sup> , 95 <sup>th</sup> , 97 <sup>th</sup> , +2 SD or Zscore deviation as possible cut offs.
RCOG, CNOF, SOGC	No guidance found

**APPENDIX B: WHO and Hadlock charts comparison:**

GA	Hadlock 95 <sup>th</sup> %ile	WHO 97.5 <sup>th</sup> %ile
36 weeks	3500g	3422g
37 weeks	3700g	3697g
38 weeks	3900g	3973g