Recommended gestational age limits when using the INTERGROWTH-21st symphysis-fundal height and fetal ultrasound standards

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The prospective, multicentre INTERGROWTH-21st study, that has produced an integrated set of clinical standards for use in routine antenatal care across the world, was population-based and conducted in eight international, geographically diverse, urban settings. Over 4500 women, at low risk of adverse maternal and perinatal outcomes, were recruited in the first trimester with accurate dating of gestational age. Their fetuses were scanned every 5±1 weeks until delivery using the same standardised equipment at each study site, and the trained, quality-controlled sonographers were blinded to the fetal biometry measures (acquired in triplicate) to minimise bias.

Importantly, the postnatal follow-up of the newborns confirmed their satisfactory health, growth and development up to 2 years of age, providing strong evidence of the cohort's suitability for the production of international growth standards. Thus, the standards represent how a fetus *should* grow if conditions are optimal, i.e. the mother is healthy, educated, not exposed to infections, living in a clean environment, adequately nourished, and receiving evidence-based antenatal care.

1. Symphysis-fundal height standards[1]

Recommendation: Use the symphysis-fundal height (SFH) standards from 15 weeks to 40 weeks' gestation.

Note: For both clinical and practical reasons, the SFH standards are recommended for use to 40 weeks' gestation. However, they can be used to 41 weeks' gestation, if clinically justified, as the derived equation can be extrapolated to that gestational age.

2. Fetal size in early pregnancy standards[2]

Recommendation: Use the fetal size (crown-rump length, CRL) in early pregnancy standards from 9 weeks to 14 weeks' gestation (or CRL of 21mm to 85mm to estimate gestational age).

Note: The standards provide CRL values up to 15 weeks' gestation; however, beyond 14 weeks' gestation, measurement of head circumference to estimate gestational age is preferable. All estimates should be provided with the corresponding error of the estimation.

3. Fetal growth standards: Bi-parietal diameter (BPD), Occipito-frontal diameter (OFD), Head circumference (HC), Abdominal circumference (AC), and Femur length (FL)[3]

Recommendation: Use the fetal growth standards from 14 weeks to 40 weeks' gestation.

Note: For both clinical and practical reasons, the fetal growth standards are recommended for use to 40 weeks' gestation. However, they can be used up to 41 weeks' gestation, if clinically justified, as the derived equations can be extrapolated to that gestational age. The BPD should be measured using the outer-to-outer caliper placement technique.

4. Estimated fetal weight standards[4]

Recommendation: Use individual fetal biometry measures for clinical decision-making. If an estimated fetal weight (EFW) is required, the EFW standards can be used from 18 weeks to 40 weeks' gestation, acknowledging the inherent margins of error.

Note: The EFW, derived from fetal biometry, is calculated using the Hadlock equation, with centiles referenced to the INTERGROWTH-21st population. As with the fetal biometry, the EFW charts can be used up to 41 weeks' gestation, if clinically justified, as the derived equations can be extrapolated to that gestational age. When using EFW to guide clinical decisions, it is important to appreciate that it represents a composite of ultrasound measurements of the fetal head, abdomen, and femur - each subject to technical variability - resulting in relatively wide confidence intervals.

5. Fetal umbilical artery Doppler centiles[5]

Recommendation: Use the fetal umbilical artery Doppler centiles from 24 weeks to 40 weeks' gestation.

Note: For both clinical and practical reasons, the Doppler centiles are recommended for use only to 40 weeks' gestation. However, they can be used to 41 weeks' gestation, if clinically justified, as the derived equation can be extrapolated to that gestational age.

References

1. Papageorghiou AT, Ohuma EO, Gravett MG, et al. International standards for symphysis-fundal height based on serial measurements from the Fetal Growth Longitudinal Study of the INTERGROWTH-21st Project: prospective cohort study in eight countries. *BMJ* 2016; **355**: i5662.

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3. Papageorghiou AT, Ohuma EO, Altman DG, et al. International standards for fetal growth based on serial ultrasound measurements: the Fetal Growth Longitudinal Study of the INTERGROWTH-21st Project. *Lancet* 2014; **384**(9946): 869-79.

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