

WS80A with Elite

5D Limb Vol : Rapid Semi-Automated Fractional Limb Volume for Fetal Soft Tissue Assessment



Key Advantages

Streamlined Workflow



Semi-automated workflow identifies limb soft tissue boundaries and efficiently calculates fractional limb volume

Easy of Use



Provides simplified workflow with editing capabilities

Diagnostic Confidence



Improves reproducibility and reduces operator dependency

5D Limb Vol

Fractional limb volume is a soft tissue parameter that is measured from 3D ultrasound of the fetal limbs. This parameter evaluates limb fat, muscle, and bone. Fractional arm volume (AVol) and fractional thigh volume (TVol) are based on 50% of the long bone diaphysis length.

Current fetal weight prediction models do not include soft tissue parameters due to several reasons; 1) soft tissue parameters are difficult to standardize, 2) manual tracing for fetal limb measurement with 3D ultrasound is time consuming, and 3) soft tissue borders are poorly visualized at the ends of fetal long bones.

However, the **5D Limb Vol** technology addresses these challenges by providing an efficient way to rapidly measure fractional limb volume. This soft tissue parameter can be added to conventional 2D ultrasound measurements of the fetal head (BPD) and abdomen (AC) to improve the precision of estimated fetal weight (EFW). This computer-assisted technology has clinical potential to detect and monitor malnourished fetuses with growth abnormalities.

“**5D Limb Vol** technology of **WS80A with Elite** improves the efficiency for measuring fractional limb volume in a busy clinical practice. This practical advancement improves the precision of estimated fetal weight by adding a soft tissue parameter to 2D anatomic measurements.”

- Dr. Wesley Lee, Department of Obstetrics & Gynecology, Baylor College of Medicine Houston, Texas, USA

Exclusive Technologies

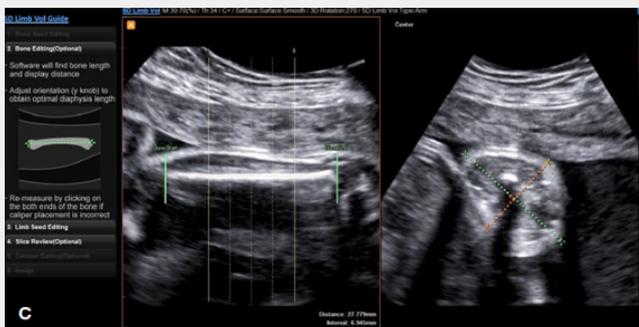
5D Limb Vol provides semi-automated and manual modes to measure fractional limb volume for fetal weight estimation. The semi-automated mode offers editing capabilities of semi-auto (adjust) and semi-manual (drawing) to improve workflow efficiency.



Step 1. 3D ultrasound volume acquisition of fetal thigh volume. A sagittal 3D transducer sweep creates a multi-planar display.



Step 2. Manual placement of a bone seed at the center of the long bone diaphysis using an axial limb cross section from the original multi-planar view.



Step 3. Semi-Automated Fractional Limb Volume Measurement Setup. The femur diaphysis length is automatically calculated (green vertical lines), and manually adjusted if necessary, to define five central image slices (left panel). Limb soft tissue borders are manually marked for short and long axis diameters (red and green dotted lines) to initiate a computer-assisted edge detection algorithm (right panel).



Step 4. Fractional Limb Volume Summary. The calculated fractional limb volume is 24.1 mL. A surface-rendered partial limb volume is also displayed in the bottom right panel to verify that appropriate soft tissue limb borders are being used.

Reference

1. Lee W et al., Fractional limb volume: a soft tissue parameter of fetal body composition. validation, technical considerations, and normal ranges during pregnancy. *Ultrasound Obstet Gynecol* 2009;33:427-440.
2. Lee W et al., Prospective validation of fetal weight estimation using fractional limb volume. *Ultrasound Obstet Gynecol.* 2013;41:198-203.

* This feature may not be available in some countries or regions.