Reference ranges for fetal volumes in the late first trimester, obtained using 9 degree rotations.

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Introduction
In the course of another study we calculated fetal volume percentile values for each week of gestation from 11 to 14 weeks using nine-degree rotation steps. Crown Rump Length and fetal volume were measured as per Salomon 2013 and Butt 2014 guidelines.

Methods
The 3D static volume angle was pre-set at 75 degrees. The image was optimised. The fetal volume was acquired in the mid sagittal plane. The standardised Z-technique was applied for fetal volume manipulation (Abuhamad 2006). VoCal was employed to calculate the fetal head and trunk volume utilising 9-degree “manual” rotation steps. The head and trunk outline was traced on the longitudinal (horizontal A-plane) image, then repeated through twenty rotations of nine degrees each. The volume was automatically calculated and presented on screen. Statistical Package for the Social Sciences (Version 20) was employed.

Results
The intraclass correlation coefficient ($r$) for fetal volume measurements was 0.994. Scatterplot above represents fetal volume at certain gestational age. The central table above indicates the 5th, 50th and 95th percentile of FV per week gestation. No data was lost.

Conclusion
Fetal volume can be quickly and easily measured in the late first trimester. The increase in volume is highly correlated with gestation ($r=0.993$). The clinical utility remains to be established.