

ULTRASOUND IN LABOR AND DELIVERY



HOW CAN ULTRASOUND CONTRIBUTE TO A SAFE AND HEALTHY BIRTH?

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Advantages of Ultrasound in Labor and Delivery

Objective Assessment of:

- **Cervical Dilatation:** Good correlation between ultrasound (US) and vaginal examination (VE) until 7 – 8 cm, though there is slight underestimation of ≈ 1 cm by US as compared to VE
- **Labor Progress:** Good correlation between angle of progression (AoP) and head-perineum distance (HPD) with head station determined by VE as well as time to delivery, plus the additional value provided by serial US measurements
- **Fetal Presentation** at onset of labor and Head Position prior to operative delivery
- **Fetal Wellbeing:** low cerebro-placental ratio (CPR) prior to labor increases the risks of emergent Cesarean delivery and identifies women requiring close surveillance in labor

Prediction of Vaginal Delivery: AoP $\geq 120^\circ$ and/or HPD ≤ 40 mm is associated with 90% chance of an uncomplicated vaginal delivery; both have similar predictive value for failed induction of labor in comparison to cervical length determined by transvaginal US or Bishop score determined by VE, and serial measurements allow identification of cases that will end up requiring a Cesarean delivery because of failure to progress.

High Reproducibility: AoP is reliable regardless of fetal head station or clinician's level of US experience although differences are encountered with different US devices.

Higher Acceptability by women than VE and less painful.

Facilitates Parental Counselling through the use of objective images.

Other: Objective **sonopartogram** and **images** of labor progress, **placenta localization**, vaginal delivery of **2nd twin**, antepartum and postpartum **bleeding**, identification of **fetal distress** (fetal bradycardia or loss of contact on CTG), etc.

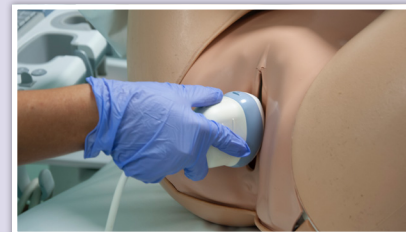
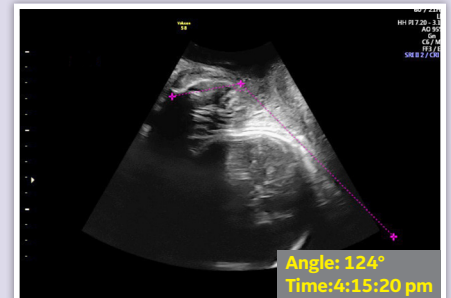
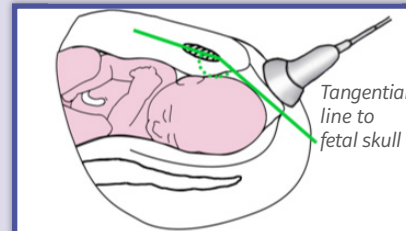


Useful Measurements

Angle of Progression

Line that divides symphysis in 2 symmetric portions.

Probe in sagittal position

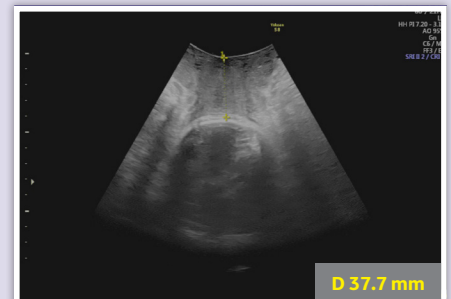
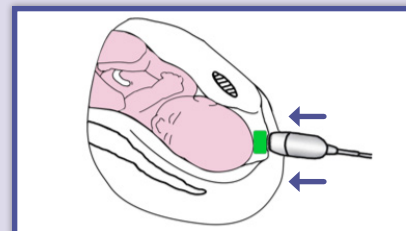


TIP: Place probe in sagittal position and slide laterally to identify symphysis. Point downwards to visualize all bony structures.

Head to Perineum Distance

Perineal compression until the shortest distance between perineum and fetal skull is achieved.

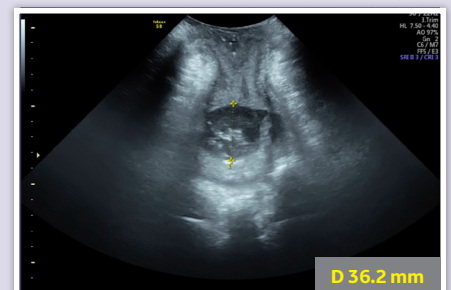
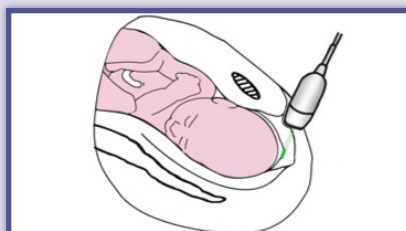
Probe in transverse position



TIP: Hold probe in transverse over the ischial tuberosity with firm pressure and tilt downwards so that it points anteriorly.

Cervical Dilatation

Probe in transverse position



TIP: Place probe in transverse over the anterior part of the labia and tilt it upwards so that it points posteriorly. Slide slightly to identify the internal os.

Recommended Literature

Barbera AF, Pombar X, Perugino G, Lezotte DC, Hobbins JC. A new method to assess fetal head descent in labor with transperineal ultrasound. *Ultrasound Obstet Gynecol* 2009; 33: 313-319.

Benediktsdottir S, Salvesen KÅ, Hjartardottir H, Eggebø TM. Reproducibility and acceptability of ultrasound measurements of head-perineum distance. *Acta Obstet Gynecol Scand* 2018; 97:97-103.

Chaemsaithong P, Kwan AHW, Tse WT, Lim WT, Chan WWY, Chong KC, Leung TY, Poon LC. Factors that affect ultrasound-determined labor progress in women undergoing induction of labor. *Am J Obstet Gynecol* 2019; 220: 592.e1-592.e15.

Chan YT, Ng KS, Yung WK, Lo TK, Lau WL, Leung WC. Is intrapartum translabial ultrasound examination painless? *J Matern Fetal Neonatal Med* 2016; 29: 3276-80.

Ghi T, Contro E, Farina A, Nobile M, Pilu G. Three-dimensional ultrasound in monitoring progression of labor: a reproducibility study. *Ultrasound Obstet Gynecol* 2010; 36: 500-506.

Hassan WA, Eggebø TM, Ferguson M, Lees C. Simple two-dimensional ultrasound technique to assess intrapartum cervical dilatation: a pilot study. *Ultrasound Obstet Gynecol* 2013; 41: 413-418.

Kasbaoui S, Séverac F, Aïssi G, Gaudineau A, Lecointre L, Akladios C, Favre R, Langer B, Sananès N. Predicting the difficulty of operative vaginal delivery by ultrasound measurement of fetal head station. *Am J Obstet Gynecol* 2017; 216: 507.e1-507.e9.

Molina FS, Terra R, Carrillo MP, Puertas A, Nicolaidis KH. What is the most reliable ultrasound parameter for assessment of fetal head descent? *Ultrasound Obstet Gynecol* 2010; 36: 493-499.

Sabdia S, Greer RM, Prior T, Kumar S. Predicting intrapartum fetal compromise using the fetal cerebro-umbilical ratio. *Placenta*; 36: 594-8.

Tse WT, Chaemsaithong P, Chan WWY, Kwan AHW, Huang J, Appiah K, Chong KC, Poon LC. Labor progress determined by ultrasound is different in women requiring cesarean delivery from those who experience a vaginal delivery following induction of labor. *Am J Obstet Gynecol* 2019; 221: 335.e1-335.e18.

Tutschek B, Torkildsen EA, Eggebø TM. Comparison between ultrasound parameters and clinical examination to assess fetal head station in labor. *Ultrasound Obstet Gynecol* 2013; 41: 425-9.

Wiafe YA, Whitehead B, Venables H, Dassah ET, Eggebø TM. Intrapartum ultrasound assessment of cervical dilatation and its value in detecting active labor. *J Ultrasound* 2018; 21: 233-239.

Yuce T, Kalafat E, Koc A. Transperineal ultrasonography for labor management: accuracy and reliability. *Acta Obstet Gynecol Scand* 2015; 94: 760-765.

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