

Screening and Treatment of Mid-trimester Short Cervix in Asymptomatic Pregnancies

I. Background

- A short cervix identified in the midtrimester of pregnancy is a strong predictor of preterm birth in all populations studied [1]
 - Effacement begins at the internal cervix os and progresses caudally, thus precedes dilatation
- Despite the strong association between short cervical length and preterm birth, most women with asymptomatic cervical shortening deliver at >35 weeks [2]

II. Goals

- A. The purposes of cervical length screening are:
 1. Identify populations of patients in which the following interventions may be beneficial:
 - Vaginal progesterone
 - Cerclage
 - Antenatal corticosteroids
 2. Avoid unnecessary interventions and subsequent screening tests in women at low risk of preterm birth. Only extremely short cervical lengths in asymptomatic patients in the midtrimester are associated with a significant risk of impending preterm birth within 2-4 weeks.
 - Women with no measurable cervical length in the midtrimester have a median time from diagnosis to delivery of 3 weeks, 65% do not deliver within 2 weeks, with only 36% risk of delivery by 32 weeks of gestation.[3]
- B. Protocols that incorporate universal cervical length screening have demonstrated a reduction in frequency of preterm birth. [4, 5]
- C. Universal transvaginal (TV) CL screening in all pregnant women is not mandated by ACOG, however, it is a reasonable evidence-based practice pattern. [6, 7] It is the preferred approach at UC. If TV CL is declined, the cervix should be visualized by abdominal approach.

III. Midtrimester (16-24 weeks) with Short Cervix

- A. Treatments with proven benefit for asymptomatic cervical shortening:
 1. Vaginal progesterone
 - Several vaginal progesterone preparations have reported efficacy for preterm birth prevention with short cervix. [4, 5, 8, 9] A meta-analysis of trials of vaginal progesterone has demonstrated efficacy in all patients studied with cervical length ≤ 25 mm. [10]
 - The most commonly used preparation is Prometrium® 200mg capsule PV qHS
 - Treatment can be discontinued at 37 wks or earlier if development of PROM.
 - 17-OHPC does not reduce the risk of PTB with incidentally noted short cervix and is not recommended as an alternative to vaginal progesterone in women with short cervix. [11]
 2. Cerclage
 - Women with a prior spontaneous preterm birth <34 weeks AND a short cervical length < 25 mm at <23 weeks, benefit from cerclage, OR 0.60 (0.37, 0.98), data from RCT. [12-15] When stratified, benefit is limited to those with shortest CL <15 mm, OR 0.23 (CI 0.08, 0.66), versus non-significant reduction for CL 15-24 mm, OR 0.84 (0.49, 1.4).

- Women with no prior spontaneous preterm birth and very short cervix <10 mm have shown to benefit from cerclage (RR 0.68, CI 0.47, 0.98), data from subgroup analysis of a meta-analysis (small n=126). [16]. Option of cerclage will be discussed with patients who meet these criteria.
 - Women with asymptomatic cervical dilation may benefit from exam indicated cerclage, mean pregnancy prolongation 34 days (CI 18-50 days), data from large meta-analysis [6, 17]
 - Cervical shortening often precedes asymptomatic cervical dilation. Up to one third of women with CL \leq 11 mm on TVUS also have cervical dilation of \geq 1cm. [18] Therefore, when asymptomatic cervical shortening \leq 11 mm is noted on ultrasound <23 weeks, digital cervical exam is advised to assess whether physical exam indicated cerclage may be indicated.
3. Antenatal corticosteroids
Improve neonatal outcomes when administered in pregnancies at risk of preterm birth. Optimum benefit is when administered in pregnancies likely to deliver within 2 weeks, i.e. in women with extremely short cervical lengths (less than 5 mm), see Antenatal Corticosteroid protocol
 4. Pessary
Current data do not support efficacy of pessary to prevent preterm birth in singleton or twin pregnancies with short cervix. Therefore, pessary is not recommended in the management of short cervix.[6]
- B. Treatments with NO proven benefit for asymptomatic cervical shortening
1. Bed rest and pelvic rest
have not been proven to improve perinatal outcomes in women with mid-trimester cervical shortening and may in fact be harmful.[19] Based on available evidence, we do not encourage activity limitations in women with asymptomatic cervical shortening in an effort to decrease preterm birth risk. Recommendations on activity limitations will be individualized after consultation with her primary OB care provider.
 2. Prophylactic tocolytic agents in patients with no evidence of preterm contractions (i.e. calcium channel blockers)
 3. Prophylactic antibiotics in patients with no evidence of infection

IV. Cervical length screening in selected populations

A. History suspicious for cervical insufficiency [20]

1. Women with history consistent with cervical insufficiency: offer history-indicated cerclage placement at 12-14 weeks (i.e. women with one or more prior second-trimester loss related to painless cervical dilation or those with a history of successful cerclage in prior pregnancy).
This prior history does not exclude women with current twin pregnancy.
2. Women with equivocal history, unclear whether there is cervical insufficiency: Offer serial CL screening and cerclage if short cervix identified. Initiate TV ultrasound cervical lengths at **14 weeks**
 - If CL \geq 30 mm, repeat every 2 weeks until 22^{6/7} weeks
 - If CL 25-29 mm, repeat every 1 week until 22^{6/7} weeks
 - If CL \leq 25 mm, offer cerclage placement

B. History of spontaneous preterm birth in prior pregnancy at 17 to <34 weeks (see figure)[15]

1. Initiate TV ultrasound cervical lengths at **16 weeks**
 - If CL \geq 30 mm, repeat every 2 weeks until 22^{6/7} weeks
 - If CL 25-29 mm, repeat every 1 week until 22^{6/7} weeks
 - If CL <25 mm, offer cerclage placement
2. No further scheduled CL screening after 22^{6/7} weeks
3. Special scenarios:
 - Both vaginal progesterone and cerclage have shown benefit with short cervix in this population, however they have not been compared to each other for superiority. Both should be discussed as treatment options. It is not known if placing cerclage in women already taking vaginal progesterone is additionally beneficial, but may be offered. [6]
 - Women with history of preterm labor but delivered at term do not fit in this category and should be treated as Low Risk.

C. Multifetal gestation

1. Single TV US cervical length at **18-24 weeks**, at anatomic survey
 - If \leq 25 mm, vaginal progesterone
 - If >25 mm, routine care
 - a. For short cervix, consider vaginal progesterone
 - There are conflicting results from trials regarding efficacy of vaginal progesterone to prevent preterm birth in twin gestations with short cervix \leq 25 mm, some showing benefit and others no benefit. [8, 21] However, vaginal progesterone is reasonable intervention considering its potential benefit and no known risk [4]
 - b. There is insufficient data to recommend for or against cerclage for short cervix in multifetal gestation. [22, 23]
 - c. Asymptomatic cervical dilation in twin pregnancies- exam indicated cerclage- may be offered based on RCT data demonstrating benefit in this population. [24]

D. Low Risk singletons (nulliparous or multiparous with prior term birth – includes pregnancies with other risk factors such as history of LEEP or uterine malformation), figure 1

1. Recommended screening is:
 - Single TVUS cervical length at **18-24 weeks**, at anatomic survey
 - If \leq 25 mm, offer vaginal progesterone[10]
 - If >25 mm, routine care
 - Women with very short cervix <10 mm may also benefit from cerclage and it should be discussed with the patient.[16]

V. Counseling

- A. Provide patient information regarding estimated likelihood of PTB based on the specific CL at gestational age when assessed, see appendix. [2, 17, 25, 26]
- B. Patients with normal cervical length > 25 mm, but otherwise at high risk of preterm birth (twins, prior preterm birth, etc) may be reassured regarding low risk of PTB by providing individualized risk assessment, see appendix.

VI. Special Situations

A. Cerclage during periviable period

- Cerclage is typically placed <23 weeks. Some patients may be candidates for cerclage between 23 0/7 – 23 6/7 weeks based on individualized counseling on risks/ benefits by MFM.
- In most circumstances, women receiving ultrasound indicated cerclage at ≥ 22 0/7 weeks do not warrant perioperative ANCS.
- Women receiving exam indicated cerclage at ≥ 22 0/7 weeks may be candidates for ANCS based on individualized counseling on risks/ benefits

B. TTTS

- Some women with TTTS and short cervix may be candidates for ultrasound indicated cerclage up to 23 6/7 weeks based on individualized counseling on risks/ benefits by fetal care team.

C. Screening with TV CL after cerclage

- Role of CL screening after intervention provided is uncertain and generally not advised.
- For ultrasound and exam indicated cerclage, it is reasonable to repeat a cervical length one week following cerclage placement. There is no benefit to serial cervical length screening thereafter.
- CL screening after cerclage may assist to identify patients at high risk of impending preterm birth (i.e. funneling to the stitch or residual CL ≤ 5 mm). Therefore, in special circumstances, further cervical length screening after cerclage may be individualized.

D. Inpatient admission and antenatal corticosteroid administration

- Extremely short cervical lengths, ≤ 5 mm, prior to 28 weeks may be associated with a significant enough likelihood of preterm birth within 2 weeks to warrant inpatient management and steroid administration (mean latency with CL = zero is 3 weeks, 36% risk of delivery within 2 weeks[3])
- Women with other concomitant risk factors may warrant inpatient management at CL > 5 mm. Recommend individualized treatment with MFM consultation.

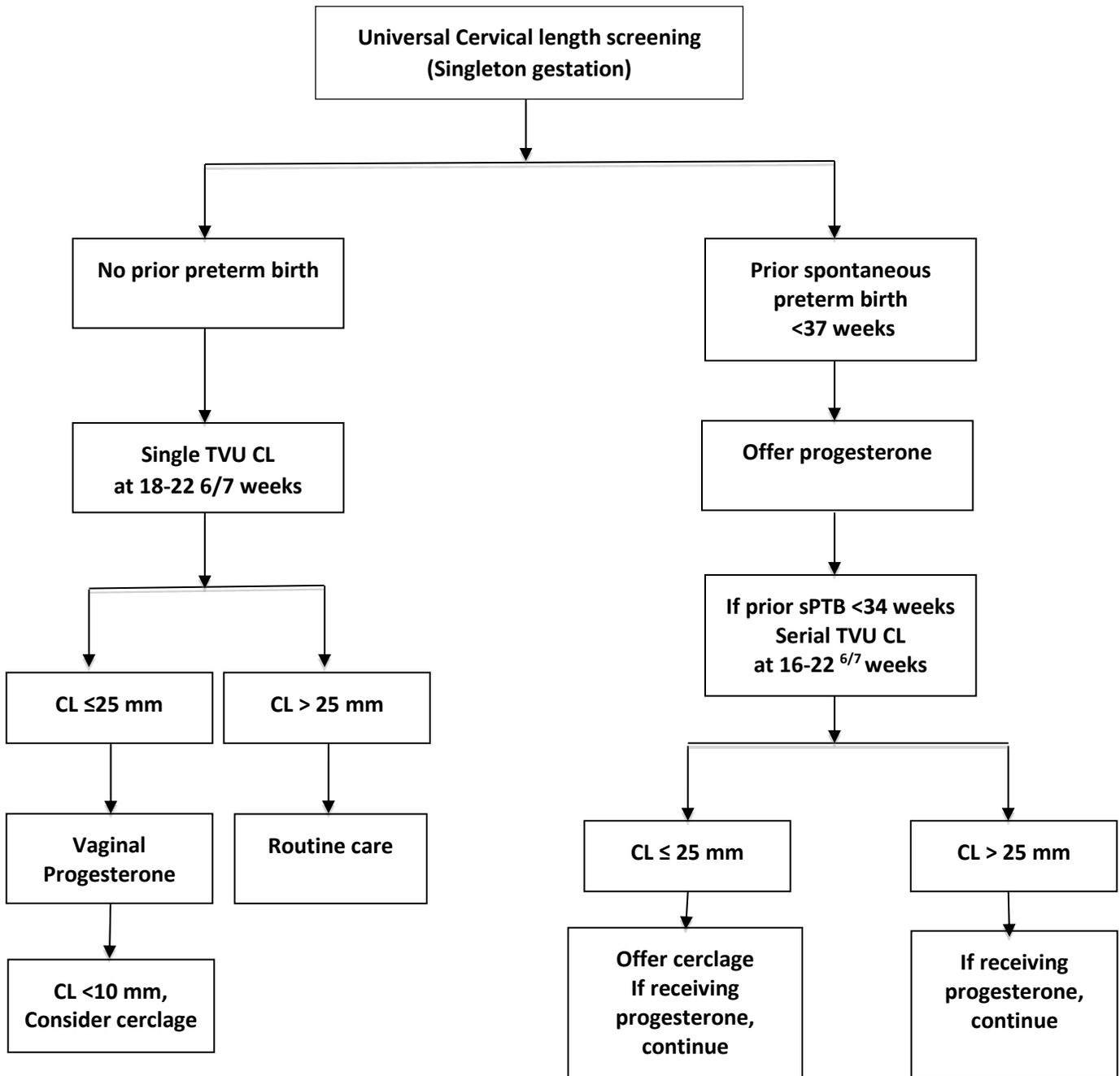
E. Preterm contractions

- Women with preterm contractions and short cervix are at especially high risk of preterm birth and should be managed by the Preterm Labor Protocol and not based on recommendations in this protocol, which is focused on the short cervix in asymptomatic women.

VII. Measuring the Cervix

- Cervical length should only be determined from images in which the lower most edge of the empty maternal bladder and the internal os and external os are visible and when the anterior and posterior lips of the cervix are of approximately equal thickness. At least 3 measurements should be captured and the single shortest measurement should be reported. Reporting additional findings such as funneling, change in length over serial measures, or change in length with fundal pressure do not add to the predictive value of reporting the single shortest cervical length measurement alone. [6, 27, 28]

Figure: Cervical Length Screening:



References:

1. Berghella, V., *Novel developments on cervical length screening and progesterone for preventing preterm birth*. BJOG, 2009. **116**(2): p. 182-7.
2. Berghella, V., et al., *Gestational age at cervical length measurement and incidence of preterm birth*. Obstet Gynecol, 2007. **110**(2 Pt 1): p. 311-7.
3. Vaisbuch, E., et al., *The risk of impending preterm delivery in asymptomatic patients with a nonmeasurable cervical length in the second trimester*. Am J Obstet Gynecol, 2010. **203**(5): p. 446 e1-9.
4. Fonseca, E.B., et al., *Progesterone and the risk of preterm birth among women with a short cervix*. N Engl J Med, 2007. **357**(5): p. 462-9.
5. Hassan, S.S., et al., *Vaginal progesterone reduces the rate of preterm birth in women with a sonographic short cervix: a multicenter, randomized, double-blind, placebo-controlled trial*. Ultrasound Obstet Gynecol, 2011. **38**(1): p. 18-31.
6. American College of, O. and B.-O. Gynecologists' Committee on Practice, *Prediction and Prevention of Spontaneous Preterm Birth: ACOG Practice Bulletin, Number 234*. Obstet Gynecol, 2021. **138**(2): p. e65-e90.
7. Society for Maternal-Fetal Medicine Publications Committee, w.a.o.V.B., *Progesterone and preterm birth prevention: translating clinical trials data into clinical practice*. Am J Obstet Gynecol, 2012. **206**(5): p. 376-86.
8. Romero, R., et al., *Vaginal progesterone decreases preterm birth and neonatal morbidity and mortality in women with a twin gestation and a short cervix: an updated meta-analysis of individual patient data*. Ultrasound Obstet Gynecol, 2017. **49**(3): p. 303-314.
9. Romero, R., et al., *Vaginal progesterone in women with an asymptomatic sonographic short cervix in the midtrimester decreases preterm delivery and neonatal morbidity: a systematic review and metaanalysis of individual patient data*. Am J Obstet Gynecol, 2012. **206**(2): p. 124 e1-19.
10. Romero, R., et al., *Vaginal progesterone for preventing preterm birth and adverse perinatal outcomes in singleton gestations with a short cervix: a meta-analysis of individual patient data*. Am J Obstet Gynecol, 2018. **218**(2): p. 161-180.
11. Grobman, W.A., et al., *17 alpha-hydroxyprogesterone caproate to prevent prematurity in nulliparas with cervical length less than 30 mm*. Am J Obstet Gynecol, 2012. **207**(5): p. 390 e1-8.
12. Berghella, V., et al., *Effectiveness of cerclage according to severity of cervical length shortening: a meta-analysis*. Ultrasound Obstet Gynecol, 2010. **35**(4): p. 468-73.
13. Berghella, V., et al., *Cerclage for short cervix on ultrasonography: meta-analysis of trials using individual patient-level data*. Obstet Gynecol, 2005. **106**(1): p. 181-9.
14. Iams, J.D. and V. Berghella, *Care for women with prior preterm birth*. Am J Obstet Gynecol, 2010. **203**(2): p. 89-100.
15. Owen, J., et al., *Multicenter randomized trial of cerclage for preterm birth prevention in high-risk women with shortened midtrimester cervical length*. Am J Obstet Gynecol, 2009. **201**(4): p. 375 e1-8.
16. Berghella, V., et al., *Cerclage for sonographic short cervix in singleton gestations without prior spontaneous preterm birth: systematic review and meta-analysis of randomized controlled trials using individual patient-level data*. Ultrasound Obstet Gynecol, 2017. **50**(5): p. 569-577.
17. Ehsanipoor, R.M., et al., *Physical Examination-Indicated Cerclage: A Systematic Review and Meta-analysis*. Obstet Gynecol, 2015. **126**(1): p. 125-35.

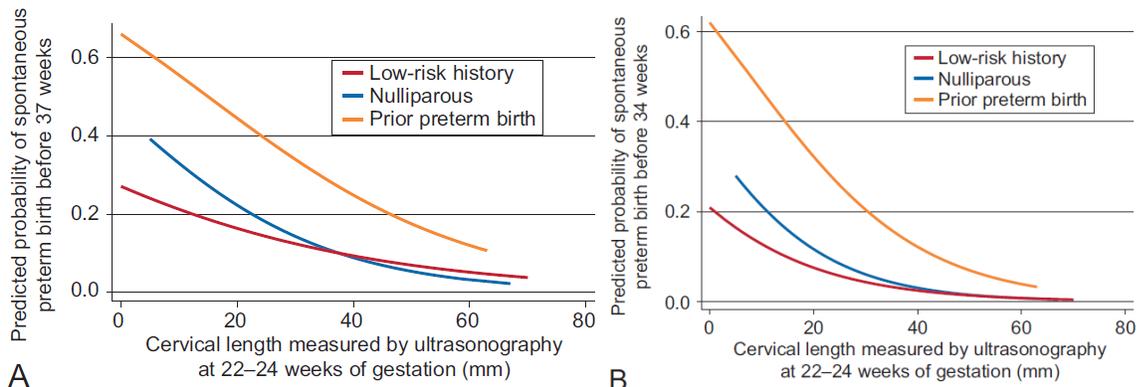
18. Boelig, R.C., et al., *Predicting asymptomatic cervical dilation in pregnant patients with short mid-trimester cervical length: A secondary analysis of a randomized controlled trial*. Acta Obstet Gynecol Scand, 2019. **98**(6): p. 761-768.
19. Grobman, W.A., et al., *Activity restriction among women with a short cervix*. Obstet Gynecol, 2013. **121**(6): p. 1181-6.
20. American College of, O. and Gynecologists, *ACOG Practice Bulletin No.142: Cerclage for the management of cervical insufficiency*. Obstet Gynecol, 2014. **123**(2 Pt 1): p. 372-9.
21. D'Antonio, F., et al., *Role of progesterone, cerclage and pessary in preventing preterm birth in twin pregnancies: A systematic review and network meta-analysis*. Eur J Obstet Gynecol Reprod Biol, 2021. **261**: p. 166-177.
22. Li, C., J. Shen, and K. Hua, *Cerclage for women with twin pregnancies: a systematic review and metaanalysis*. Am J Obstet Gynecol, 2019. **220**(6): p. 543-557 e1.
23. Saccone, G., et al., *Cerclage for short cervix in twin pregnancies: systematic review and meta-analysis of randomized trials using individual patient-level data*. Acta Obstet Gynecol Scand, 2015. **94**(4): p. 352-8.
24. Roman, A., et al., *Physical examination-indicated cerclage in twin pregnancy: a randomized controlled trial*. Am J Obstet Gynecol, 2020. **223**(6): p. 902 e1-902 e11.
25. Celik, E., et al., *Cervical length and obstetric history predict spontaneous preterm birth: development and validation of a model to provide individualized risk assessment*. Ultrasound Obstet Gynecol, 2008. **31**(5): p. 549-54.
26. Facco, F.L. and H.N. Simhan, *Short ultrasonographic cervical length in women with low-risk obstetric history*. Obstet Gynecol, 2013. **122**(4): p. 858-62.
27. Conde-Agudelo, A. and R. Romero, *Predictive accuracy of changes in transvaginal sonographic cervical length over time for preterm birth: a systematic review and metaanalysis*. Am J Obstet Gynecol, 2015. **213**(6): p. 789-801.
28. Saade, G.R., et al., *Cervical funneling or intra-amniotic debris and preterm birth in nulliparous women with midtrimester cervical length less than 30 mm*. Ultrasound Obstet Gynecol, 2018. **52**(6): p. 757-762.
29. Ehsanipoor, R.M., et al., *Gestational age at cervical length measurement and preterm birth in twins*. Ultrasound Obstet Gynecol, 2012. **40**(1): p. 81-6.

Appendices

Singletons:

Estimate the risk of preterm birth by cervical length:

<https://fetalmedicine.org/research/assess/preterm/cervix>[25]



Facco and Simhan. Short Cervix in Low-Risk Women. *Obstet Gynecol* 2013.

[26]

Twins:

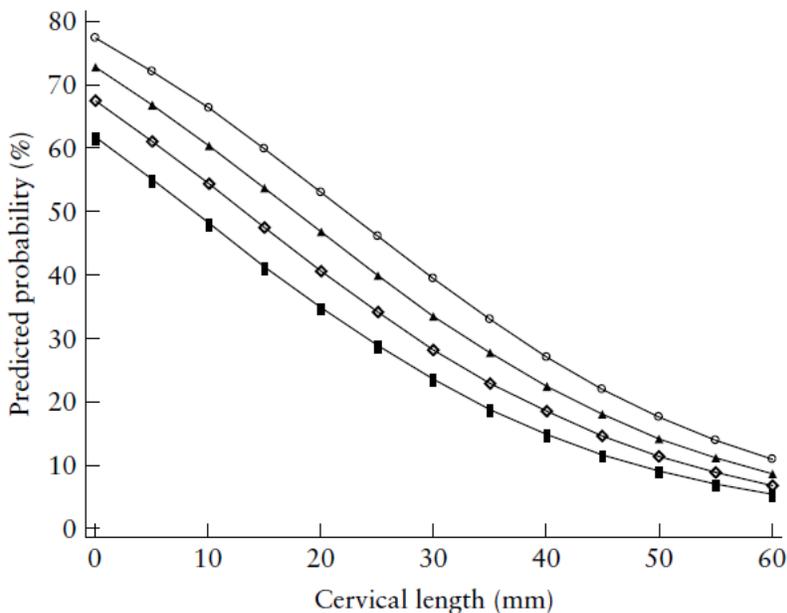


Figure 2 Predicted probability of delivery of twin pregnancies before 35 weeks' gestation based on cervical length and gestational age (GA) at time of measurement. ○, GA 16 weeks; ▲, GA 20 weeks; ◇, GA 24 weeks; ■, GA 28 weeks.

Ultrasound Obstet Gynecol 2012; 40: 81–86 [29]