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# CERVICAL LENGTH SCREENING: DO'S AND DON'TS

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APRIL 19, 2019*

# LECTURE OBJECTIVES

- Why does Cervical Length Matter?
- How to obtain an adequate Cervical Length
- Management options for short cervix (BRIEF)
- Who should be screened, who could be screened, and who shouldn't be screened?
- Patient Cases

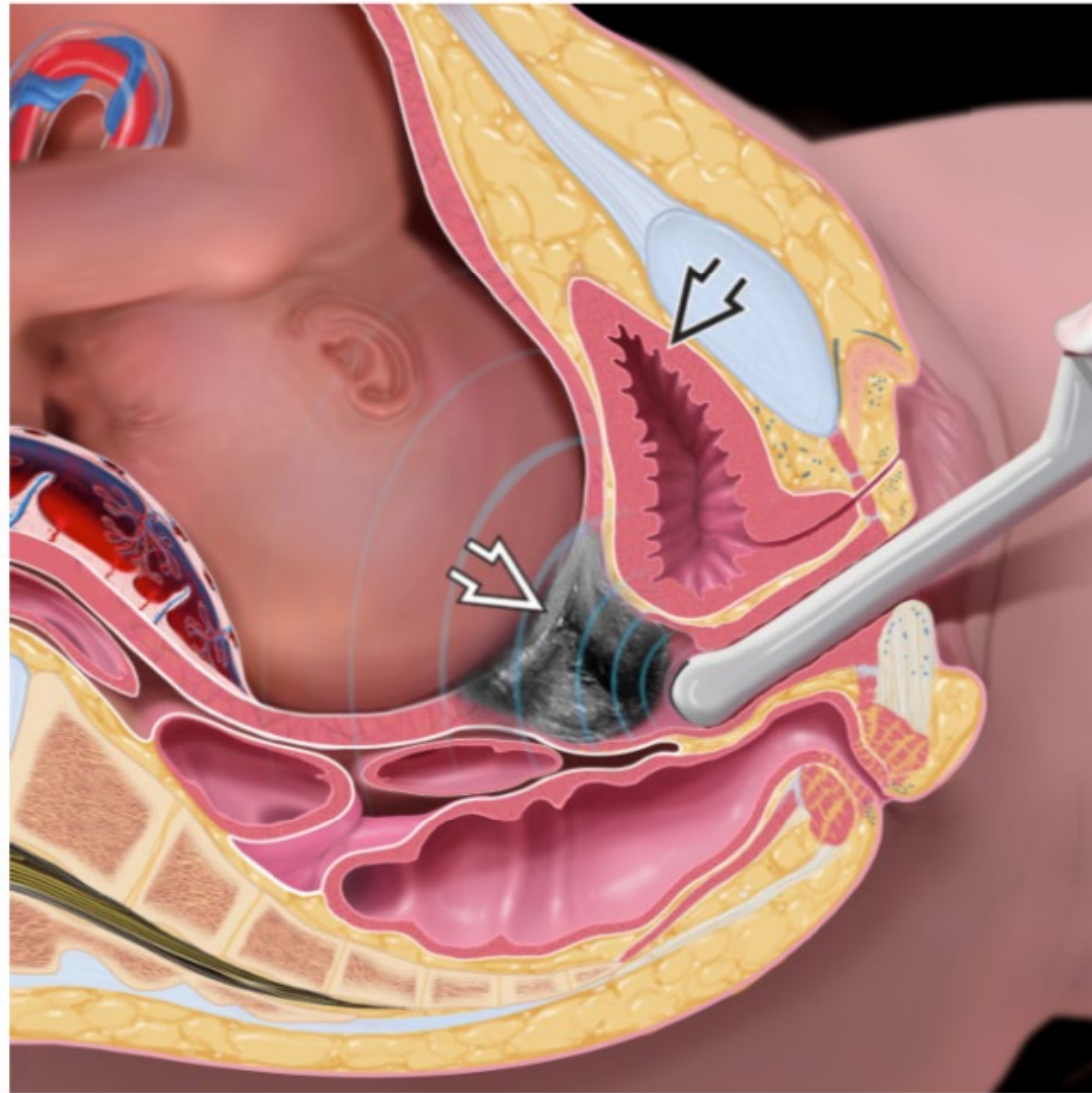
# WHY DOES CERVICAL LENGTH MATTER?



- Short Cervical Length is a marker for increased risk for preterm birth (PTB)
  - PTB leading cause of death in children <5yrs
  - PTB ranks ahead of cardiovascular disease as global cause of lost human potential
- History of PTB and short cervix are most consistent risk factors for PTB
- Risk is inversely proportional to cervical length
- Worse prognosis if short cervix AND Funneling
- Amniotic sludge is independent risk factor for PTB

<https://www.askideas.com/40-world-prematurity-day-pictures-and-photos/>

# OBTAINING A CERVICAL LENGTH (CL)



## **Transvaginal Ultrasound (TVUS)**

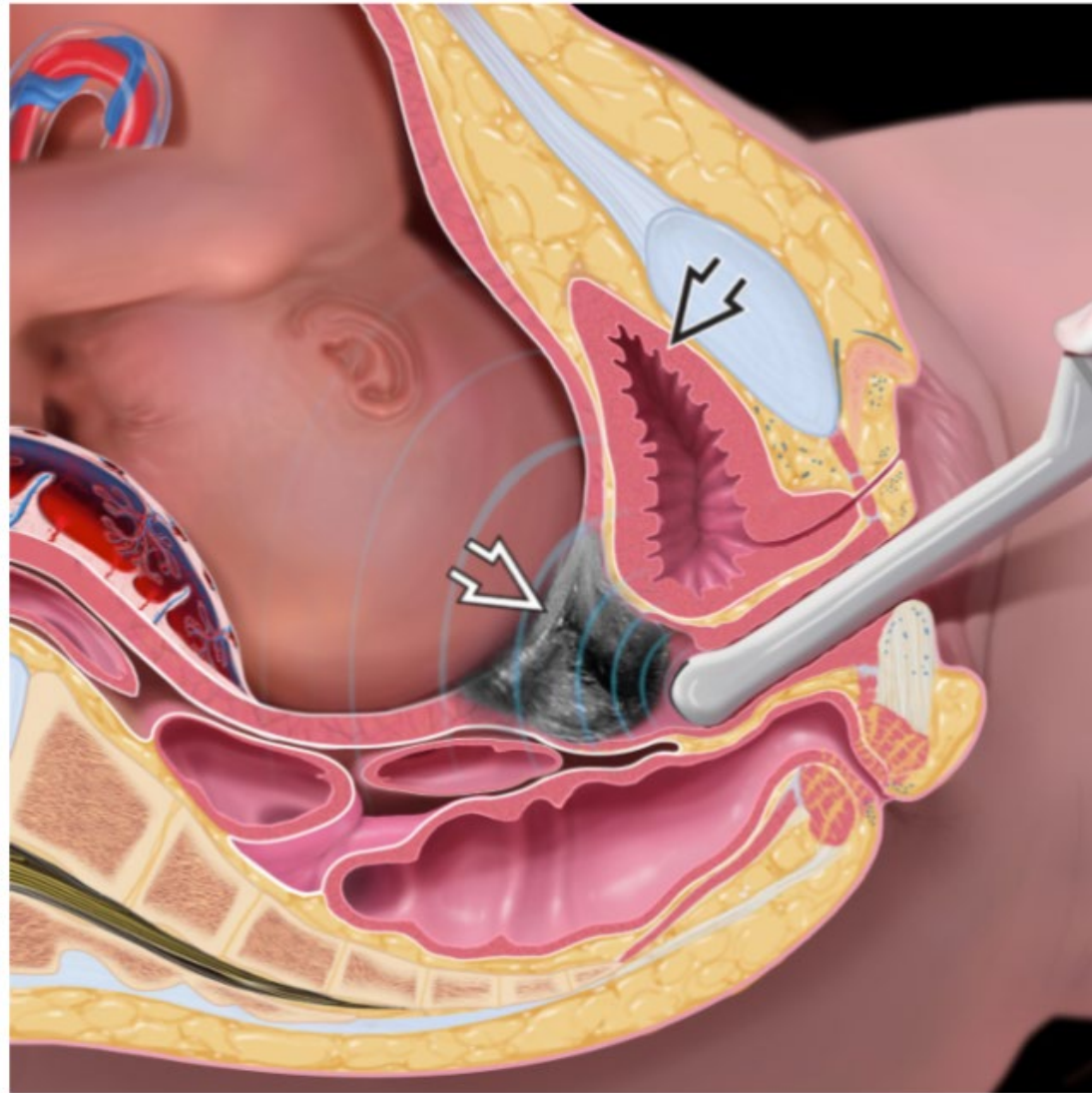
- Gold Standard
- Most reproducible technique

## **Transabdominal Imaging may be compromised by:**

- Maternal Pubic Symphysis
- Fetal Parts
- Maternal Body Habitus
- Bladder Fullness (may compress lower uterine segment and mimic long, closed cervix)



# OBTAINING A CERVICAL LENGTH (CL)



## BOX 1

### Steps for proper cervical length measurement

- (1) Ensure patient has emptied her bladder.
- (2) Prepare the cleaned probe using a probe cover.
- (3) Gently insert the probe into the patient's vagina.
- (4) Guide the probe into the anterior fornix.
- (5) Obtain a sagittal, long-axis image of the entire cervix.
- (6) Remove the probe until the image blurs and then reinsert gently until the image clears (this ensures you are not using excessive pressure).
- (7) Enlarge the image so that the cervix occupies two thirds of the screen.
- (8) Ensure both the internal and external os are seen clearly.
- (9) Measure the cervical length along the endocervical canal between the internal and external os.
- (10) Repeat this process twice to obtain 3 sets of images/measurements.
- (11) Use the shortest best measurement.

Cervical Length Education and Review ([www.perinatalquality.org/CLEAR](http://www.perinatalquality.org/CLEAR)), a program of training and certification, is offered through the Perinatal Quality Foundation.

SMFM. Role of routine cervical length screening for preterm birth prevention. *Am J Obstet Gynecol* 2016.

# OBTAINING A CERVICAL LENGTH (CL)

## Other key pointers for adequate Transvaginal Ultrasound CL

- Measure anterior-posterior diameter of Dilated Internal Os
- Check CL at beginning of exam (cervix is dynamic; length shortest in patients who have been upright recently)
- Observe for 3-5 minutes with TV US (r/o dynamic changes)
- Avoid excessive vaginal transducer pressure
- Use fundal pressure to unveil short cervix (15 seconds – r/o dynamic cervix)
- Evaluate for presence of amniotic fluid “sludge” or debris
  - Associated with increased risk for PTB



# OBTAINING A CERVICAL LENGTH

**clear**  
Cervical Length Education and Review

Home About Us Program Information Image Criteria Practice Administrators Contact Us

Username:   
Password:   
   
[Having trouble logging in?](#)  
Are you a Practice Administrator?

CLEAR Component	Cost	ACOG Credit	SDMS Credit
Lectures		1.0	1.0
Examination	\$150	1.5	2.0
Image Review			
Approval Effective Dates		2016	2016 - 2019
Total Cost/CME	\$150	2.5	3.0

The CLEAR program consists of the following:

**Lectures**

The lectures listed below are available on line on video and handouts may be downloaded as Adobe PDF or Power Point.

Lecture 1: Why Measure Cervical Length  
Lecture 2: How to Measure Cervical Length  
Lecture 3: The CLEAR Program  
Lecture 4: Translating Knowledge Into Clinical Practice

**Web-based Examination**

The CLEAR program includes a web-based examination consisting of twenty multiple choice and image-based questions. The participants must pass the examination with a score of 70%. A participant

**CLEAR ACCEPTED BY ABOG FOR MOC CATEGORY IV**

We are happy to report that successful completion of the CLEAR web course education, examination and image requirements has been accepted by the American Board of Obstetrics and Gynecology (ABOG) for Maintenance of Certification (MOC) Part IV: Improvement in Medical Practice.

**Measurement of the Cervix**

**Normal Cervix**

**Cervix Measurement Image Criteria**

Transvaginal Image  
Field of View is Optimized for Measurement  
Anterior Width = Posterior Width  
Maternal Bladder Empty  
Internal Os Seen  
External Os Seen  
Cervix Canal Visible Throughout  
Caliper Placement Correct  
Cervix Mobility Considered

The Perinatal Quality Foundation convened a cervix education task force in November 2011. The goal of the task force was to develop consensus education that presented in a widely available format the standard criteria for sonographic cervical measurements during pregnancy.

The Cervical Length Education and Review (CLEAR) program is a product of task force discussions.

Members of the task force and the organizations represented are the following:

Vincenzo Berghella, MD co-chair  
Jay Iams, MD co-chair  
Richard Berkowitz, MD Perinatal Quality Foundation

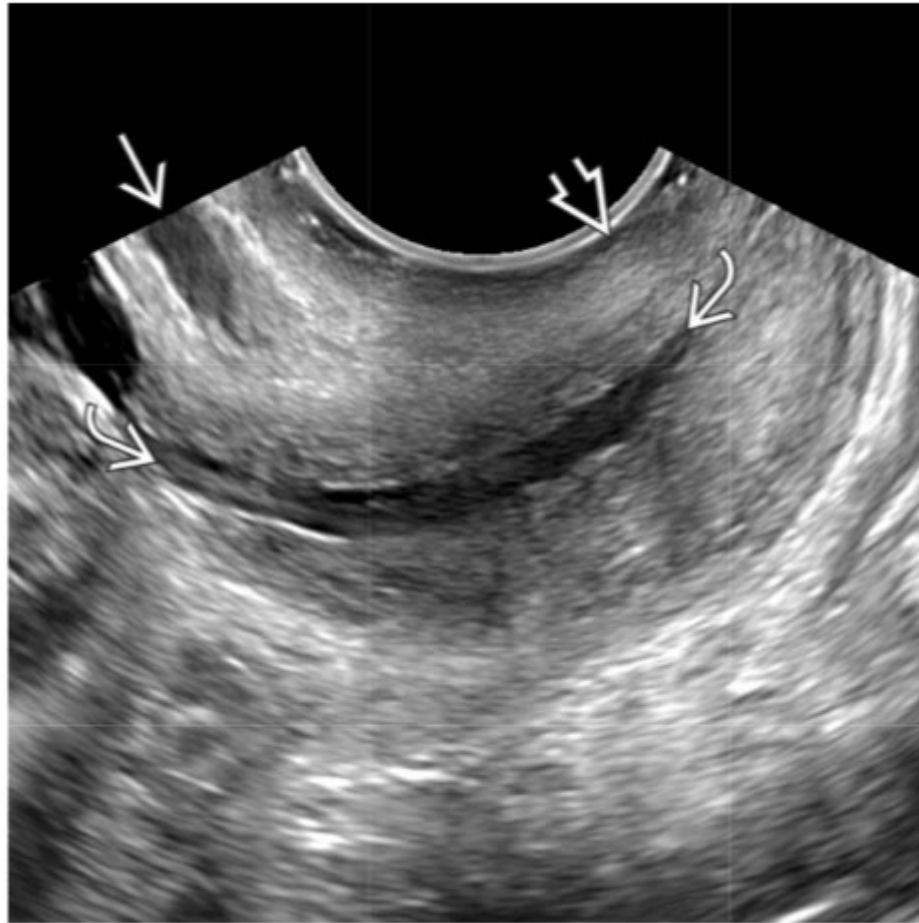
**SMFM: We recommend sonographers and/or practitioners receive specific training in the acquisition and interpretation of cervical imaging during pregnancy (Grade 2B)**

## Cervical Length Education & Review (CLEAR) (SMFM and Perinatal Quality Foundation)

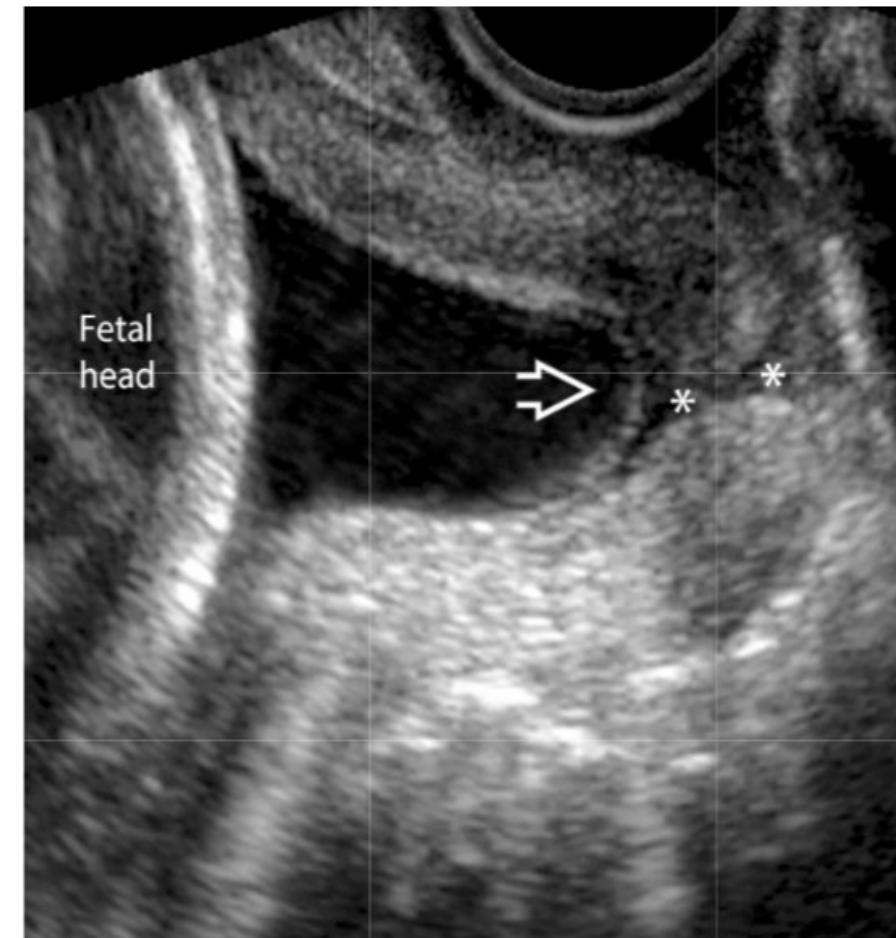
- Online Training Program
  - CME Credit and satisfies ABOG MOC Part IV requirements for Improvement in Medical Practice
- Online Lectures (4 Total)
- Online Exam
- Image Review Program
  - Participants submit a batch of 5 CL images)
  - Images reviewed and graded by experienced reviewers

<https://clear.perinatalquality.org/> SMFM Consult Series #40 (smfm.org)

# OBTAINING A CERVICAL LENGTH



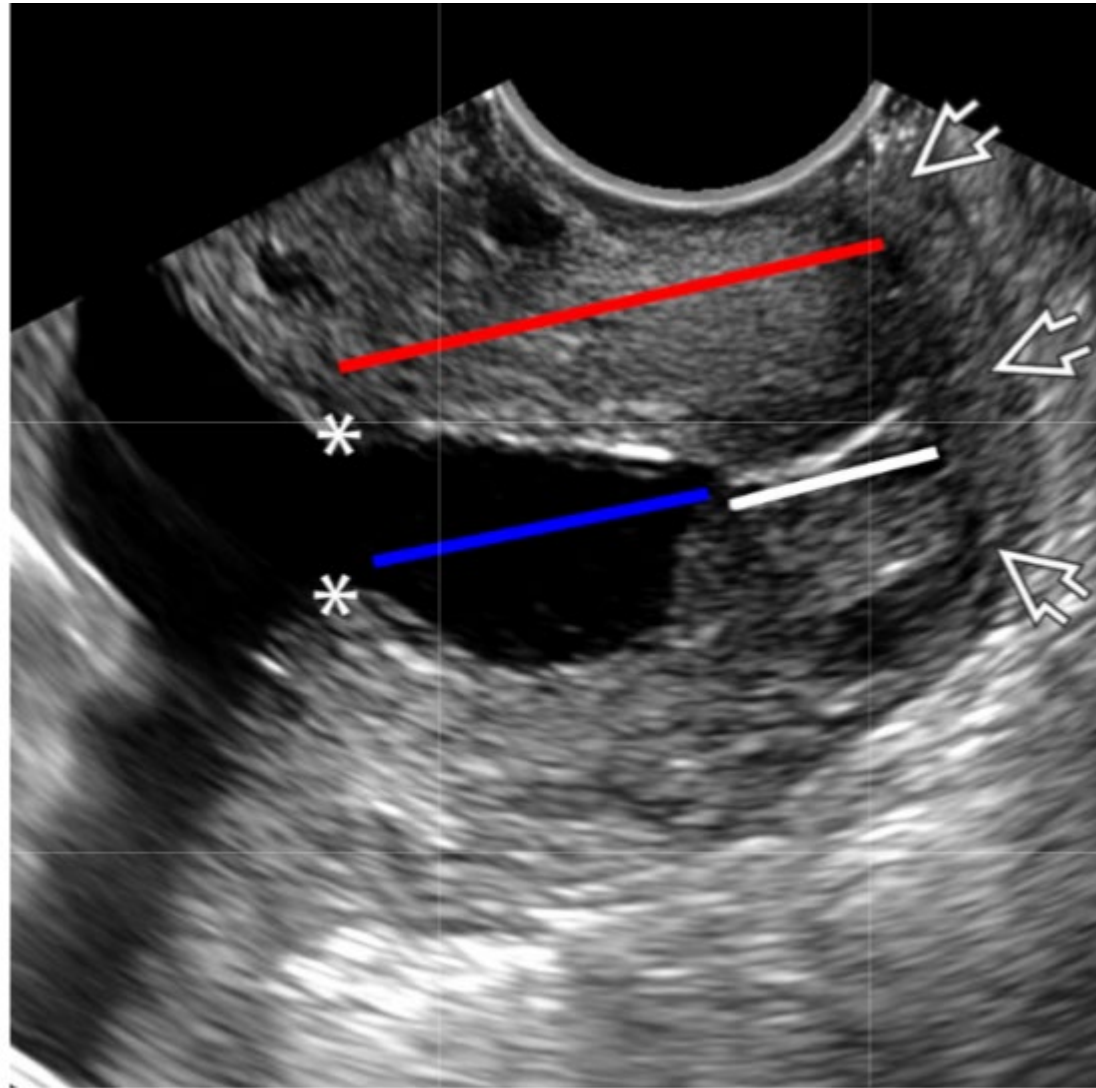
Normal CL on TVUS



Short CL on TVUS



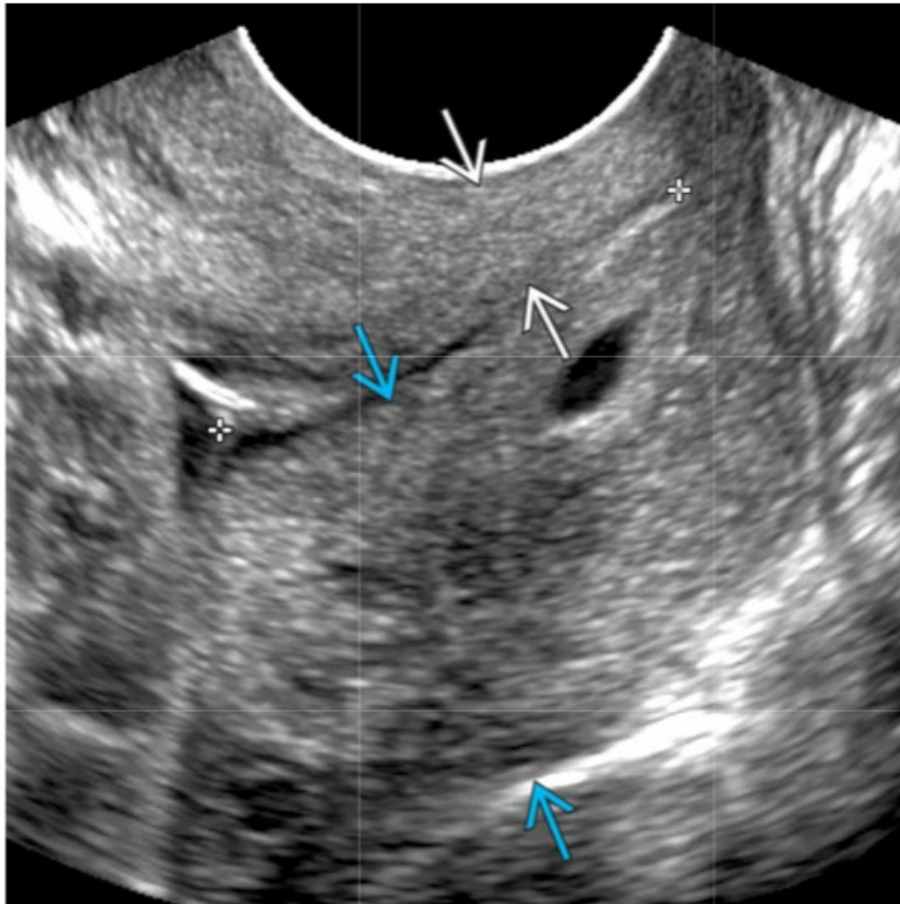
# OBTAINING A CERVICAL LENGTH



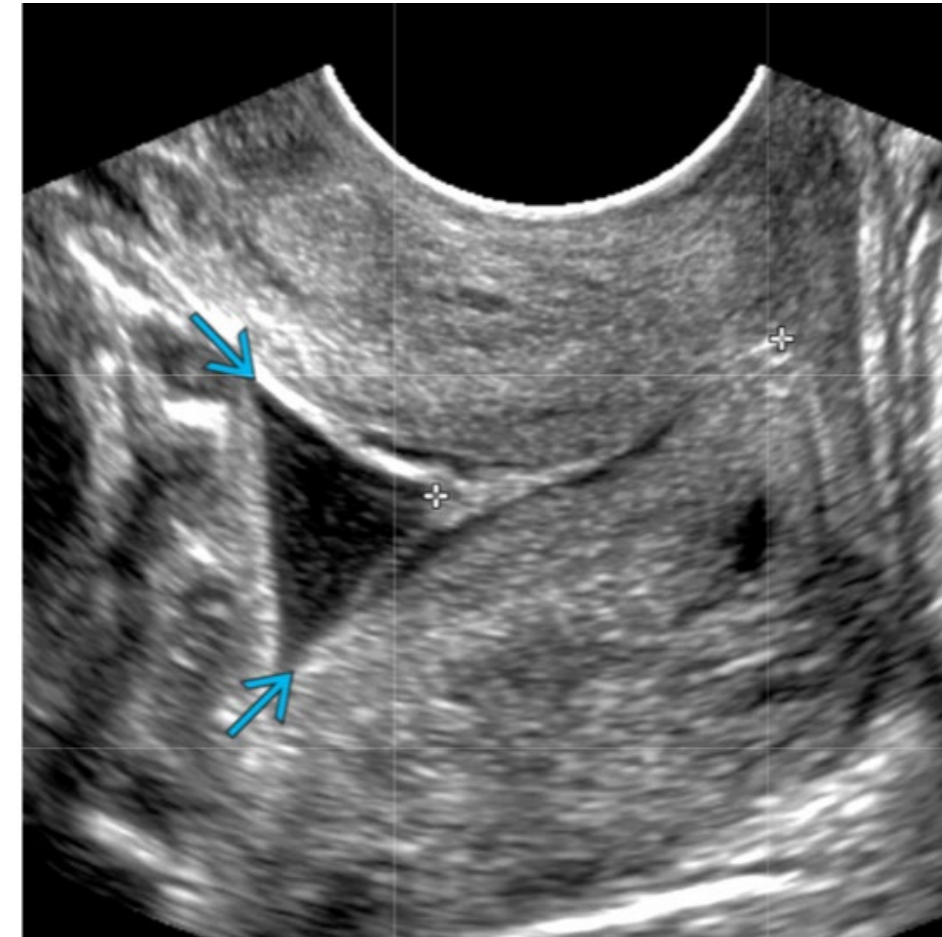
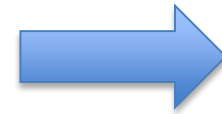
## Transvaginal Ultrasound (TVUS)

- \* Internal Os Diameter
- Blue – Length of Funnel
- White – Functional Cervical Length
- Red – Total Cervical Length

# OBTAINING A CERVICAL LENGTH



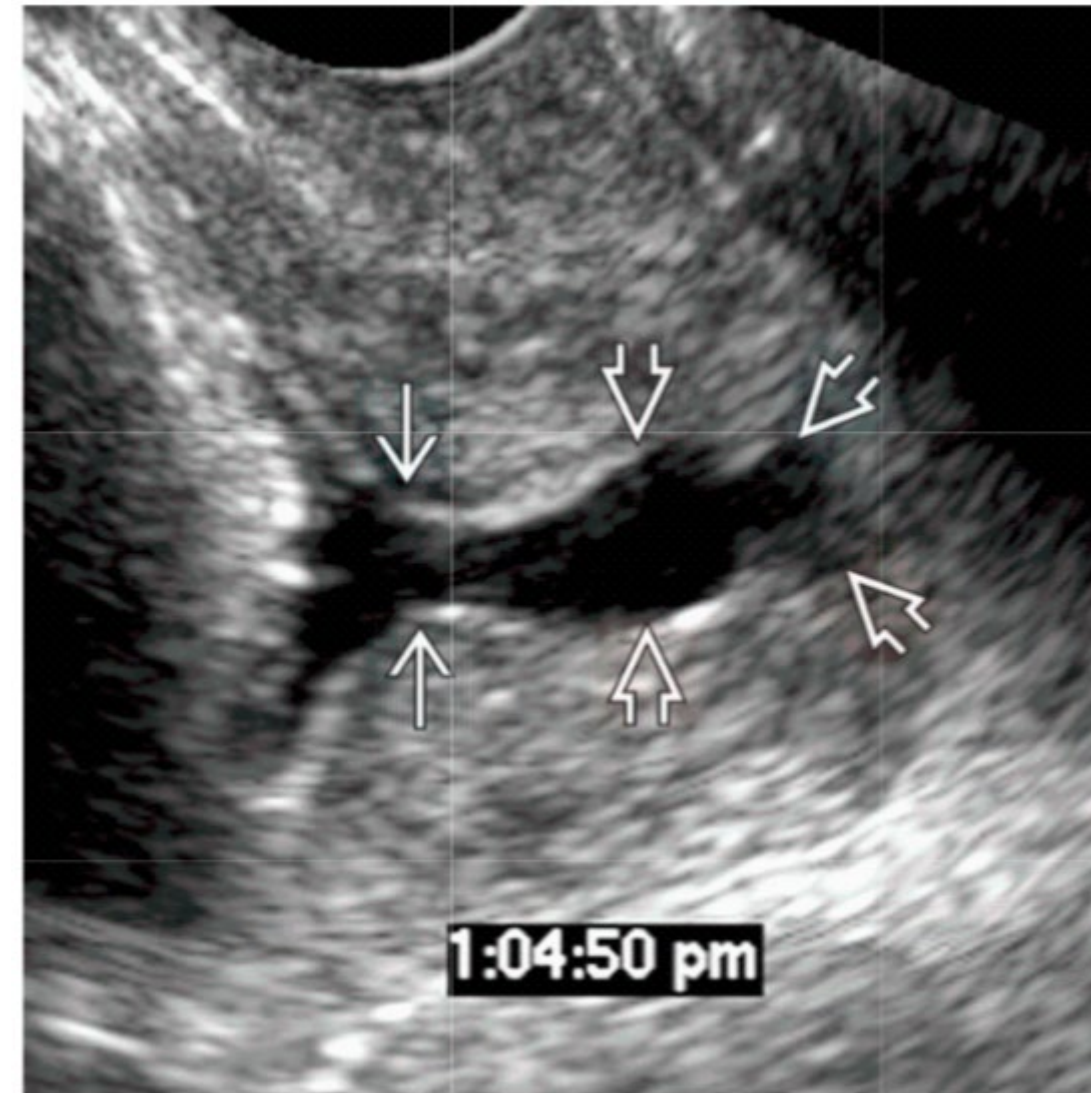
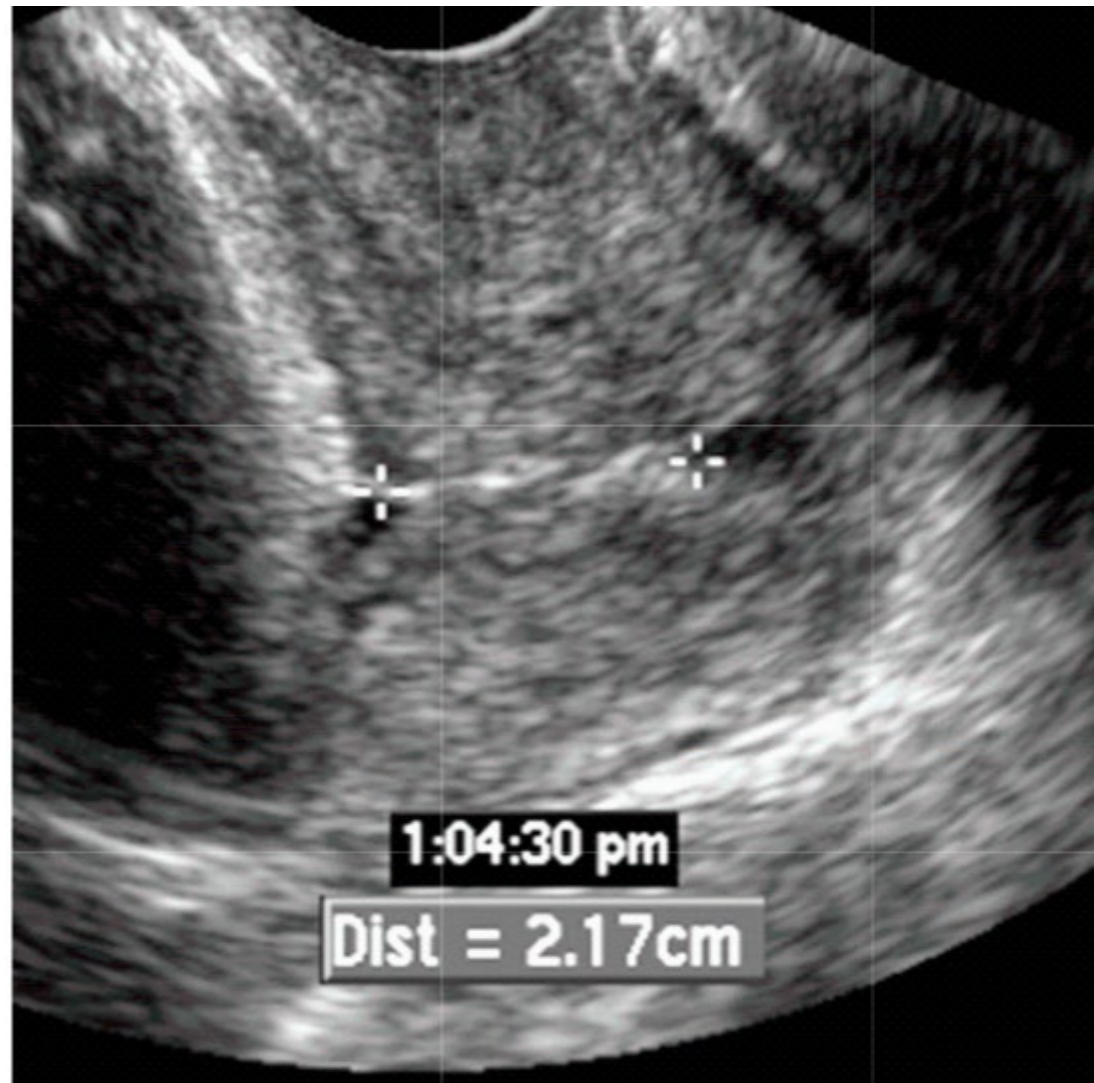
“Normal” CL on TVUS with  
Excessive transducer pressure



Short CL on TVUS with  
Normal transducer pressure



# OBTAINING A CERVICAL LENGTH





# OBTAINING A CERVICAL LENGTH



A short cervical length identified on US should be followed up with a clinical evaluation

- **Do an exam!**
  - Findings may alter your clinical management and counseling

# MANAGEMENT OF THE SHORT CERVIX

## Medical Approach

Vaginal progesterone

## Mechanical Approach

Cervical Cerclage

Cervical Pessary

# MANAGEMENT OF THE SHORT CERVIX

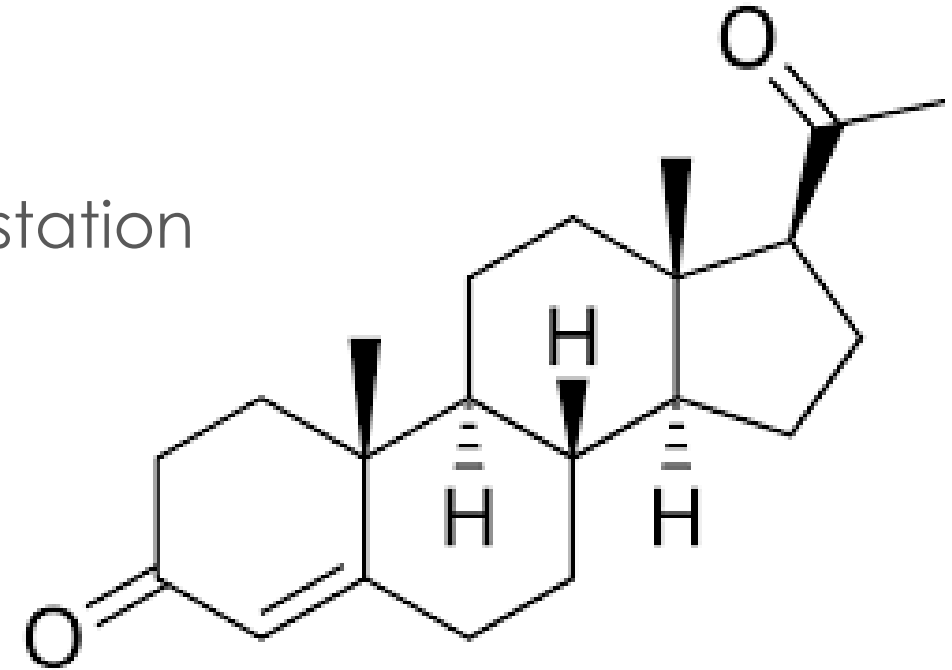
## Medical Approach

### **Vaginal progesterone**

90mg gel or 200mg suppository qday until 36w gestation

Indicated if short cervix  $\leq 20\text{mm}$  identified  
in a singleton gestation with no prior PTB  
at  $< 24\text{w}$  gestation

(Fonseca 2007, Hassan 2011, Romero 2016)





# MANAGEMENT OF THE SHORT CERVIX

## Mechanical Approach Cervical Cerclage

### **Box 1. Indications for Cervical Cerclage in Women With Singleton Pregnancies** ⇐

#### **History**

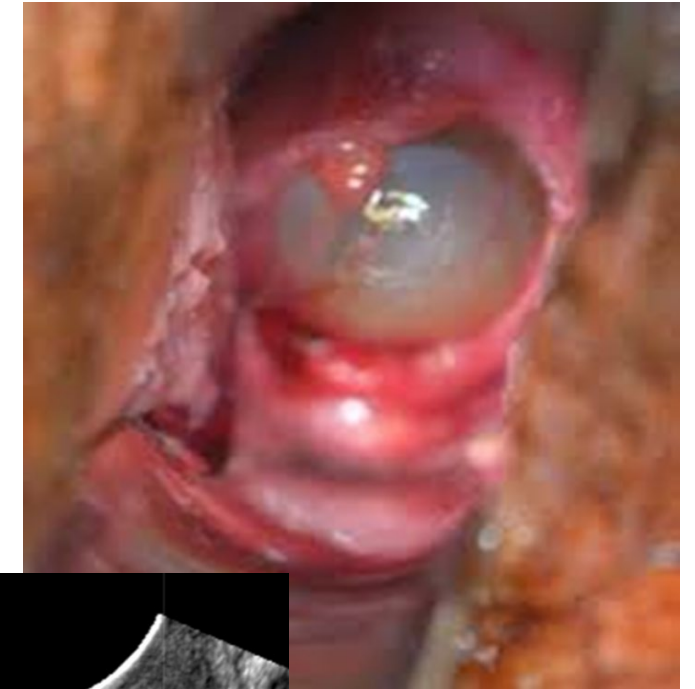
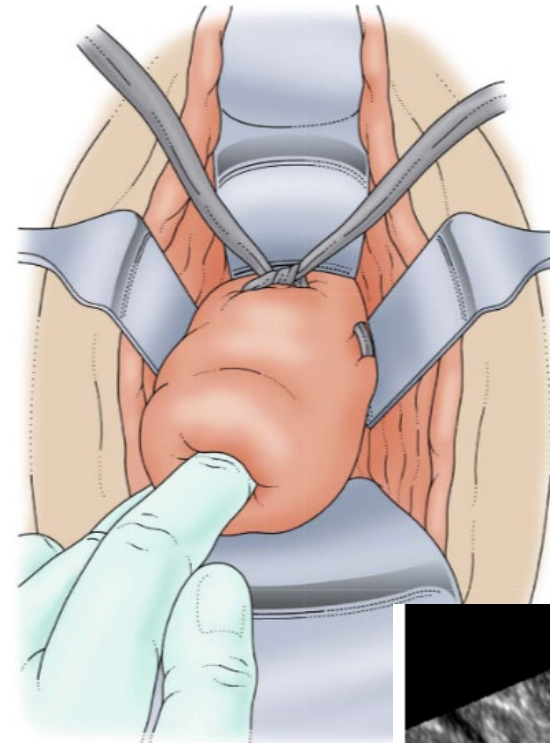
- History of one or more second-trimester pregnancy losses related to painless cervical dilation and in the absence of labor or abruptio placentae
- Prior cerclage due to painless cervical dilation in the second trimester

#### **Physical Examination**

- Painless cervical dilation in the second trimester

#### **Ultrasonographic Finding With a History of Prior Preterm Birth**

- Current singleton pregnancy, prior spontaneous preterm birth at less than 34 weeks of gestation, and short cervical length (less than 25 mm) before 24 weeks of gestation



(Pereira 2007, Owen 2009, Berghella 2011)

ACOG Practice Bulletin Number 142, February 2014 (Reaffirmed 2019), Diagnostic Imaging: Obstetrics (3<sup>rd</sup> Edition)

# MANAGEMENT OF THE SHORT CERVIX

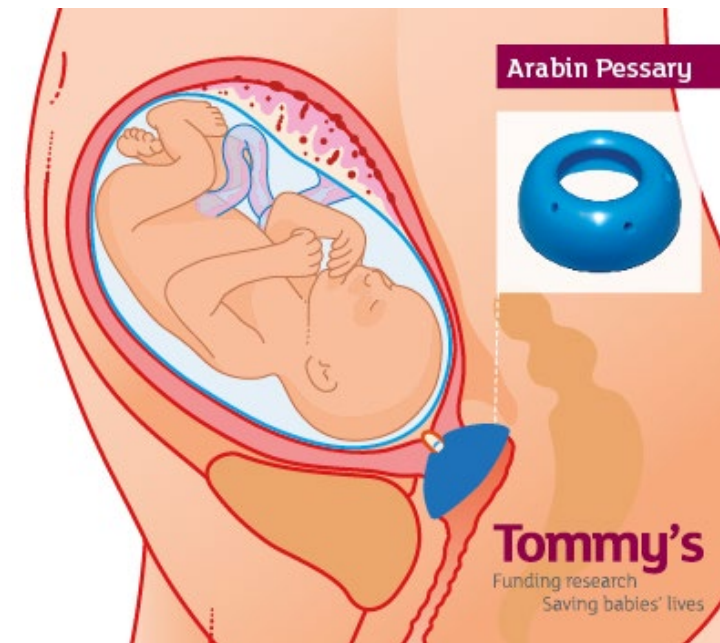
## Mechanical Approach

### Pessary (e.g. Arabin Pessary)

NOT FDA Approved in the US at this time



(Goya 2012, Nicolaides 2016)



<https://dr-arabin.de/produkt/arabin-cerclage-pessary-perforated/?lang=en>

<https://www.tommys.org/pregnancy-complications/prem-birth/treatment/cervical-incompetence>

# WHO SHOULD, COULD OR SHOULDN'T BE SCREENED?



Society for Maternal-Fetal Medicine  
(SMFM) Consult Series | #40  
[smfm.org](http://smfm.org)

## The role of routine cervical length screening in selected high- and low-risk women for preterm birth prevention



Society for Maternal-Fetal Medicine (SMFM); Jennifer McIntosh, MD; Helen Feltovich, MD; Vincenzo Berghella, MD; Tracy Manuck, MD



# WHO SHOULD BE SCREENED?

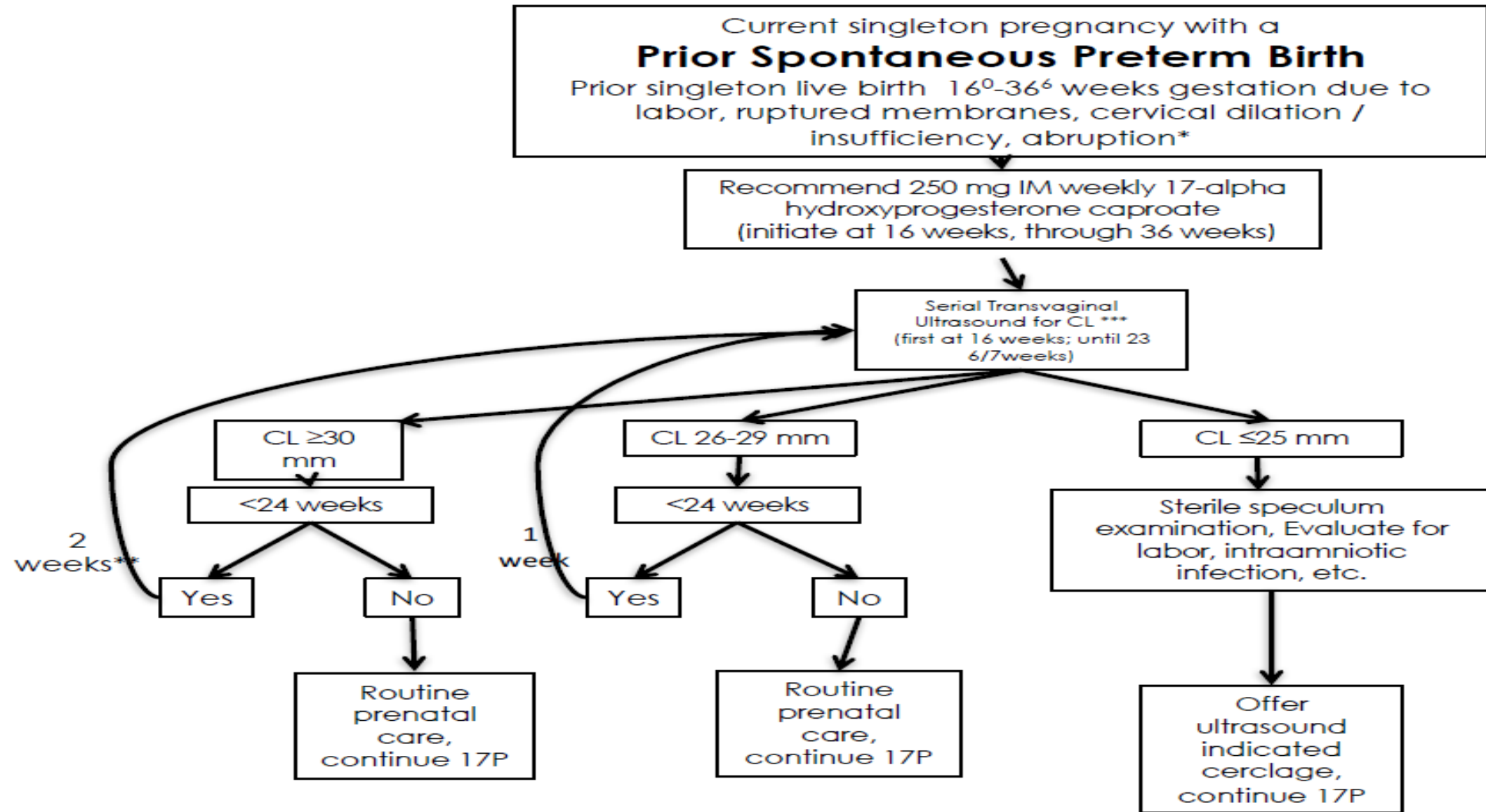
**Patients with history of prior spontaneous preterm birth and singleton gestation**  
(ACOG & SMFM Guidelines)

- Serial TV US every 1-2 weeks per clinical scenario
- Screening should be performed between 16-24w

**“We recommend routine transvaginal CL Screening for women with singleton pregnancy and history of prior spontaneous preterm birth (Grade 1A)”**

# WHO SHOULD BE SCREENED?

Patients with history of prior spontaneous preterm birth with singleton gestation



# WHO COULD BE SCREENED?

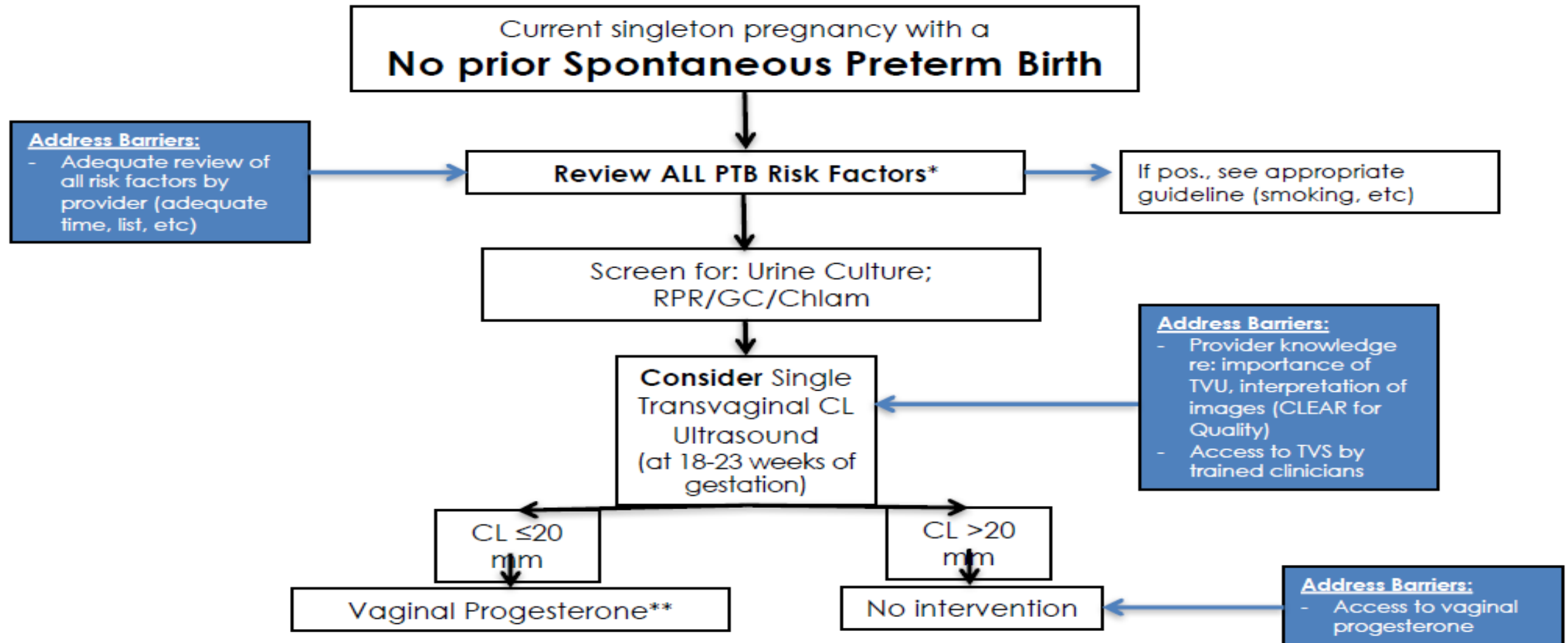
## Universal Cervical Length Screening

“Current SMFM guidelines state CL screening in singleton gestations without prior PTB cannot yet be universally mandated”

**“Practitioners who decide to implement universal CL screening should follow strict guidelines (Grade 2B).”**



# WHO COULD BE SCREENED?



No cerclage, or pessary, for these women

SMFM Preterm Birth Toolkit <https://www.smfm.org/publications/231-smfm-preterm-birth-toolkit>

# WHO COULD BE SCREENED?

Research

JAMA | Original Investigation

## Predictive Accuracy of Serial Transvaginal Cervical Lengths and Quantitative Vaginal Fetal Fibronectin Levels for Spontaneous Preterm Birth Among Nulliparous Women

M. Sean Esplin, MD; Michal A. Elovitz, MD; Jay D. Iams, MD; Corette B. Parker, DrPH; Ronald J. Wapner, MD; William A. Grobman, MD, MBA; Hyagriv N. Simhan, MD; Deborah A. Wing, MD; David M. Haas, MD, MS; Robert M. Silver, MD; Matthew K. Hoffman, MD; Alan M. Peaceman, MD; Steve N. Caritis, MD; Samuel Parry, MD; Pathik Wadhwa, MD, PhD; Tatiana Foroud, PhD; Brian M. Mercer, MD; Shannon M. Hunter, MS; George R. Saade, MD; Uma M. Reddy, MD, MPH; for the nuMoM2b Network

Esplin et al. JAMA 2017

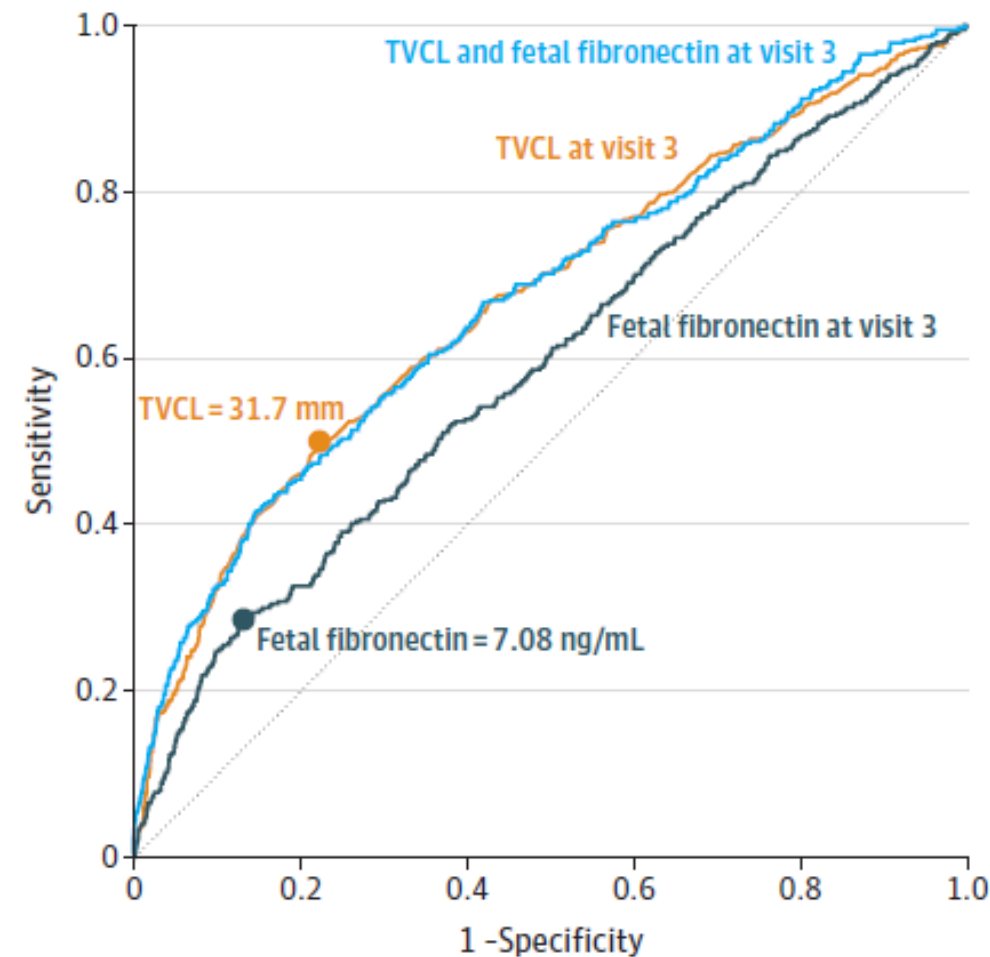
# WHO COULD BE SCREENED?

Research

JAMA | Original Investigation  
**Predictive Accuracy of Cervical Lengths and Quantitative Fetal Fibronectin for Spontaneous Preterm Birth**

M. Sean Esplin, MD; Michal A. Williams, MD; William A. Grobman, MD, MB; Robert M. Silver, MD; Matthew J. Pathik Wadhwa, MD, PhD; Tamara S. George R. Saade, MD; Uma M. Reddy, MD

Figure 2. Receiver Operating Characteristic Curves for Visit-3 Measures Predicting Spontaneous Preterm Birth at Less Than 37 Weeks' Gestation



Esplin et al. JAMA 2017

# WHO COULD BE SCREENED?

## Threatened Preterm Labor – CL as adjunct to SVE to predict PTB

TVCL may aid in assessment and management in women with symptoms of PTL

- CL  $\geq 30$ mm (NPV 96-100% for PTB)
- CL  $< 20$ mm  $\rightarrow$  warrants PTL treatment based on CL alone
- CL 20-29mm (Grey zone) +/- Fetal Fibronectin (FFN) – **CONTROVERSY ALERT**
  - FFN Screening NPV  $> 90\%$ , PPV 9-46%
  - (Berghella & Saccone 2016) Systematic Review of 6 RCTs evaluating clinical outcomes and management in the setting of physician knowledge of FFN results or no knowledge of FFN results
    - Knowledge of FFN results did NOT reduce rates of PTB compared with control group
    - Knowledge of FFN result group resulted in similar rates of hospitalization, tocolytics and BMZ compared to control group
    - Hospital costs were higher in knowledge of FFN group



# WHO SHOULDN'T BE SCREENED?

- Women with hx of treatment for cervical dysplasia (e.g. LEEP, CKC)
- Routine screening after cerclage placement
- Women with multiple gestations
  - NO CERCLAGE for short cervix (may be harmful!)
  - Intervention for identified short cervix is active area of investigation
- Women with PPROM
- Women with Placenta Previa

**“We recommend routine transvaginal CL screening not be performed for women with cervical cerclage, multiple gestation, PPROM or placenta previa. (Grade 2B)”**

# ACTIVE AREAS OF RESEARCH

## Maternal-Fetal Medicine Units Network

EUNICE KENNEDY SHRIVER | NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT

### Randomized Clinical Trials

PROJECT NAME	TRIAL/STUDY NAME	TIMEFRAME	CLINICALTRIALS.GOV / PMID
SLEEP	RCT of Continuous Positive Airway Pressure (CPAP) for Sleep Apnea in Pregnancy	2018-ongoing	NCT03487185
TXA	Tranexamic Acid for the Prevention of Obstetrical Hemorrhage After Cesarean Delivery: Randomized Controlled Trial	2018-ongoing	NCT03364491
TOPS	RCT of Pessary in Singleton Pregnancies with a Short Cervix	2017-ongoing	NCT02901626
PROSPECT	RCT of Pessary and Progesterone for Preterm Prevention in Twin Gestation with a Short Cervix	2015-ongoing	NCT02518594
CMV	RCT to Prevent Congenital Cytomegalovirus	2012-ongoing	NCT01376778
ARRIVE	Induction in Nulliparous Women at 39 Weeks to Prevent Adverse Outcomes: Randomized Controlled Trial	2014-2017	NCT01990612
STAN RCT	RCT of Fetal ECG ST Segment and T Wave Analysis as an Adjunct to Electronic Fetal Heart Rate Monitoring	2010-2014	NCT01131260

<https://mfmunetwork.bsc.gwu.edu/PublicBSC/MFMU/MFMUPublic/research-projects/>

# PATIENT CASES

# PATIENT CASE

A nulliparous patient at 22 weeks of gestation undergoes transabdominal ultrasonography that indicates a cervical length of 2.0cm. No dynamic changes are observed and the fetal size is consistent with dates.

The best next step in management is:

- (a) Fetal fibronectin
- (b) Uterine tocodynamometry
- (c) Digital cervical examination
- (d) Review of preterm labor symptoms
- (e) Transvaginal ultrasonography





# PATIENT CASE (CONTINUED)

A repeat US 2 weeks later revealed a cervical length of 15mm. She has experienced no contractions, vaginal bleeding or leakage of vaginal fluid. Speculum exam was negative for membrane rupture or prolapsed membranes. Her cervix is soft and closed on pelvic exam.

The best next step in management is:

- (a) Bed rest
- (b) Cerclage placement
- (c) Intramuscular progesterone
- (d) Repeat cervical length in 1 week
- (e) Vaginal progesterone

# CONCLUSION

- Short Cervical Length is a marker for increased risk for preterm birth
- Technical Considerations for Proper Cervical Length Screening (e.g. CLEAR)
- DO SCREEN women with history of prior spontaneous preterm birth <37w
- Universal Screening for low risk, asymptomatic women is not currently mandated but reasonable (institution dependent)
- Serial CL Screening is not warranted
  - Hx Cervical dysplasia s/p excision
  - Multiple gestations (Cerclage may be harmful in short cervix)
  - Patients s/p cerclage placement
  - PPROM
  - Placenta Previa
- Consider enrolling eligible patients in MFMU Network Studies!
  - PROSPECT (multiple gestation with short cervix <3cm)
  - TOPS (singleton gestation with short cervix <2cm)

**Page MFMU 801-339-0162 OR Call**  
**Amber: 801-585-5499**  
**Kendyl: 801-587-0966**

# REFERENCES

SMFM Consult series #40, The role of routine cervical length screening in selected high-and low-risk women for preterm birth prevention AJOG 2016

Fonseca EB, Celik E, Parra M, Singh M, Nicolaides KH, Fetal Medicine Foundation Second Trimester Screening Group. Progesterone and the risk of preterm birth among women with a short cervix. N Engl J Med 2007; 357:462-9.

Hassan SS, Romero R, Vidyadhari D, et al. PREGNANT Trial. 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;38:18-31.

Romero R, Nicolaides KH, Conde-Agudelo A, O'Brien JM, Cetingoz E, Da Fonseca E, Creasy GW, Hassan SS. Vaginal progesterone decreases preterm birth  $\leq 34$  weeks of gestation in women with a singleton pregnancy and a short cervix: an updated meta-analysis including data from the OPPTIMUM study. US Obstet Gynecol 2016; 48(3):308-17.

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Pereira L, Cotter A, Gomez R, Berghella V, Prasertcharoensuk W, Rasanen J, Chaithongwongwatthana S, Mittal S, Daly S, Airolidi J, Tolosa JE. Am J Obstet Gynecol 2007;197(5):e1-8.

Owen J, Hankins G, Iams JD, Berghella V, Sheffield JS, Perez-Delboy A, 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;201:375.e1-375.e8.

Berghella V, Rafael TJ, Szychowski JM, Rust OA, Owen J. Cerclage for short cervix on ultrasonography in women with singleton gestations and previous preterm birth: a meta-analysis. Obstet Gynecol 2011;117:663-71.

Esplin MS, Elovitz MA, Iams JD, Parker CB, Wapner RJ, Grobman WA, et al. Predictive Accuracy of Serial Transvaginal Cervical Lengths and Quantitative Vaginal Fetal Fibronectin Levels for Spontaneous Preterm Birth Among Nulliparous Women. JAMA. 2017;317(10):1047-1056.

Berghella V, Saccone G. Fetal fibronectin testing for prevention of preterm birth in singleton pregnancies with threatened preterm labor: a systematic review and metaanalysis of randomized controlled trials. Am J Obstet Gynecol 2016;215:431-8.

Prolog Obstetrics 7<sup>th</sup> Edition Critique Book

# QUESTIONS



