Routine cervical length screening to prevent PTB

Answers to frequently asked questions about when to perform CL measurement.

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Worldwide, 15 million babies are born too soon every year, causing 1.1 million deaths, as well as short- and long-term disability in countless survivors. In high-income countries, preterm birth (PTB) is the leading cause of death in children <5 years, and globally it is second only to pneumonia. Few prognostic tests are available to predict which pregnancies will deliver preterm. The majority (2/3) of PTBs are spontaneous, and recurrence risks are high; a history of a prior spontaneous PTB is historically the strongest risk factor for spontaneous PTB.

The purpose of this document is to review the indications and rationale for cervical length (CL) screening to prevent PTB in various clinical scenarios.

Q | What is the clinical significance of a sonographically short cervix?

Women with a history of a prior spontaneous PTB account for only 10% of all births <34 weeks' gestation. Currently, mid-trimester CL assessment by transvaginal ultrasound is the best clinical predictor of spontaneous PTB. A CL below the 10th percentile for gestational age is considered "short." At 18 to 24 weeks' gestation, the 10th percentile corresponds to a CL of less than 25 mm.

The risk of spontaneous PTB is inversely proportional to the length of the cervix; those with the shortest CL have the highest risk of prematurity.

THE RISK OF SPONTANEOUS PTB IS INVERSELY PROPORTIONAL TO THE LENGTH OF THE CERVIX; THOSE WITH THE SHORTEST CL HAVE THE HIGHEST RISK OF PREMATURITY.

Women with a history of a prior spontaneous PTB *and* a short CL are at the highest risk. Nonetheless, the finding of a short CL, irrespective of prior pregnancy history, has been consistently and reproducibly associated with an elevated risk of spontaneous PTB across all gestational age cutoffs and multiple patient populations.

Should transabdominal or transvaginal ultrasound

Transvaginal ultrasound is considered the "gold standard" measurement when assessing CL. In contrast to transabdominal ultrasound, transvaginal ultrasound measurements are highly reproducible, and measurements are unaffected by maternal obesity, cervical position, and shadowing from fetal parts. Transvaginal

ultrasound is also much more sensitive than transabdominal ultrasound using CL cutoffs that are typical for screening for a short cervix.

Transvaginal ultrasound is safe, and when it is performed by trained operators, results are reproducible with a low interobserver variation rate of 5%-10%.

Q What steps should be performed to accurately evaluate the CL?

With the woman's bladder emptied, the vaginal transducer should be inserted into the anterior fornix of the vagina and positioned so that the endocervical canal is visualized. The ultrasound probe should be gradually withdrawn until the image is just visible to ensure there is no excessive pressure on the probe. A minimum of 3 CL measurements should be obtained by placing calipers at the internal and external os. The shortest, best measurement should be recorded.

Ideally, measurements should be obtained by sonographers and/or practitioners who have received specific training in acquiring and interpreting cervical imaging during pregnancy. Several training programs are available online, including the Cervical Length Education and Review (CLEAR) program (sponsored by SMFM and its Perinatal Quality Foundation, available at https://clear.perinatalquality.org), and the Fetal Medicine Foundation's Certificate of Competence in cervical assessment (available at https://fetalmedicine.org).

Q If the CL is assessed by ultrasound, when during pregnancy should it be evaluated?

If transvaginal CL screening is performed, the cervix should *notbe* routinely measured prior to 16 weeks' gestation. Before that time, the lower uterine segment is underdeveloped, making it challenging to distinguish this area from the endocervical canal.

Studies evaluating first and early second trimester cervical length have not shown adequate predicitve value for PTB. Routine CL screening is also not indicated beyond 24 weeks' gestation, because studies of interventions (eg, cerclage, vaginal progesterone) have used 24 weeks' gestation as the upper gestational age limit for screening and initiation of therapy, and thus there is no evidence that screening beyond this point improves outcome.

THERE IS NO EVIDENCE THAT SCREENING BEYOND 24 WEEKS' GESTATION IMPROVES OUTCOME.

How should the approach to CL screening differ for women with and without a prior preterm birth?

The approach to CL screening varies based on patient characteristics and risk factors. The American College of Obstetricians and Gynecologists (ACOG) and SMFM recommend that women with a prior spontaneous PTB undergo CL screening with transvaginal ultrasound. Serial assessment of CL (every 1-2 weeks as determined by the clinical situation) from 16 until 24 weeks' gestation also is recommended.

The issue of universal transvaginal ultrasound CL screening of singleton gestations without prior PTB for the prevention of PTB remains a matter of debate. CL screening in singleton gestations without prior PTB cannot yet be universally mandated. Nonethless, implementation of such a screening strategy can be viewed as reasonable, and can be considered by individual practitioners. Given the impact on prenatal care and potential misuse of universal screening, stretching the criteria and management beyond those tested in RCTs should be prevented. Practitioners who decide to implement universal CL screening should follow strict guidelines.

Data regarding real-world implementation of CL screening programs are evolving.

OTHER SPECIAL SITUATIONS

Should women with a history of treatment for cervical dysplasia (in the absence of a prior PTB) undergo routine CL screening?

No. Evidence is insufficient to support additional screening for women with a previous electrosurgical procedure (loop electrical excision procedure [LEEP]) or cold knife cone for cervical dysplasia.

Q Should women undergo routine CL screening after cerclage placement?

No. Several small studies have attempted to answer this question in regards to all types of cerclage (history-indicated, ultrasound-indicated, and physical exam-indicated). Their results demonstrate that progressive cervical shortening after cerclage increases the risk of PTB, particularly if CL is <10 mm, but neither overall CL nor length below the stitch correlate well with outcomes, and importantly, there are currently no additional treatment options for a short cervix after cerclage (eg, reinforcement suture does not improve outcomes).

Q Should women with multiple gestations undergo routine CL screening?

In women with multiple pregnancies, the cervix is shorter and associated with an increased risk of PTB. In the large, multicenter Preterm Prediction Study conducted by the MFMU Network, approximately 18% of women with twin gestations had a CL <25 mm at 22-24 weeks' gestation (compared to 9% of singletons).

The risk of PTB with a CL <25 mm was increased 8-fold in twins, compared to 6-fold in singletons. Although a short cervix is associated with an increased risk of PTB in twins, studies are limited, and no interventions have been shown in a well-designed prospective RCT to improve outcomes among women with multiple gestations. For this reason, routine CL screening in multiple pregnancies is not currently recommended by SMFM or ACOG.

SUMMARY OF RECOMMENDATIONS

Recommendations	GRADE
We recommend routine transvaginal CL screening for women with singleton pregnancy and history of prior spontaneous PTB.	1A: Strong recommendation, high-quality evidence
We recommend routine transvaginal CL screening not be performed for women with cervical cerclage, multiple gestation, PPROM, or placenta previa.	2B: Weak recommendation, moderate-quality evidence
We recommend that sonographers and/or practitioners receive specific training in the acquisition and interpretation of cervical images during pregnancy.	2B: Weak recommendation, moderate-quality evidence

What is the role of CL screening to predict PTB for women in other clinical scenarios?

THREATENED PRETERM LABOR

Among women with symptoms of acute preterm labor, transvaginal ultrasound CL can serve as an important adjunct to digital cervical examination. In addition, several studies have verified the negative predictive value of the fetal fibronectin (FFN) test as an additional adjunct in this setting.

The combination of CL and FFN may improve prediction of PTB among women with symptoms of acute preterm labor. FFN is most useful in women with CL 20-29 mm because the test can determine the need for intervention (antenatal corticosteroids, transfer to tertiary center, etc.).

PRETERM PREMATURE RUPTURE OF MEMBRANES (PPROM)

Prospective studies incorporating nearly 500 women with PPROM are conflicting. Although CL measurement does not appear to cause harm with PPROM and a shortened cervix is associated with shorter latency, there are insufficient data to suggest a clinical benefit to CL measurement or surveillance.

PLACENTA PREVIA

Three prospective studies evaluated the utility of CL *in the third trimester* as a predictor for emergency cesarean delivery and hemorrhage in women with previa. All studies used a CL cutoff of 30 mm to define the cervix as "short," and reported that women with a short CL were more likely to have hemorrhage and emergent delivery.

While these 3 studies demonstrate that there may be an association between shortened CL and PTB in the setting of placenta previa, there are no prospective studies testing a management strategy based on CL, such that insufficient data to suggest a proven clinical benefit to routine CL measurement or surveillance.