

Transvaginal ultrasound assessment of cervical length

Standard Operating Procedure

Purpose

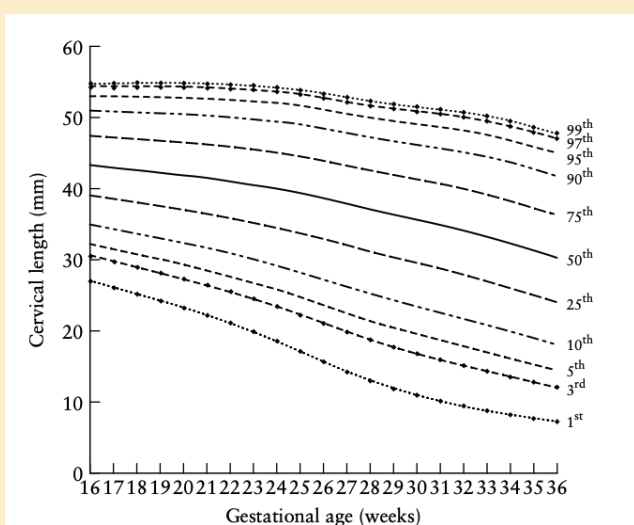
This document describes the steps required for accurate transvaginal cervical length assessment.

This document has been developed to support hospitals and healthcare professionals to operationalise the recommendations of Taonga Tuku Iho. The background and summary of evidence to support these recommendations can be reviewed on the Carosika Collaborative Taonga Tuku Iho website.

Background

Cervical length measurement is used as a prediction tool for spontaneous preterm birth in two different scenarios (1) wāhine/people with recognised risk factors and/or (2) wāhine/people who are symptomatic of preterm labour. It has an important role in guiding preventative treatment such as vaginal progesterone and cervical cerclage^{1,2} and may be used as triage tool to identify those most likely to go onto preterm birth once symptoms have commenced.³

A transvaginal approach is the gold standard for cervical length assessment, allowing optimal visualisation and accuracy of measurement.¹ Although a transabdominal approach is associated with reduced scan time, resource use and patient discomfort, it is less precise and reproducible, and prone to technical issues.¹ These technical issues include acoustic attenuation especially for wāhine/people with an elevated body mass index and shadowing from fetal or maternal structures.¹ Acceptability of transvaginal scans is high.¹ Studies have shown that >90% of wāhine/people consider transvaginal examination of the cervix to be associated with mild or no discomfort or embarrassment.⁴



In the general population, cervical length is typically stable between 14 and 28 weeks of gestation, and tends to gradually shorten at later gestations.^{5,6} A normal reference range for cervical length has been identified.

For simplicity, in asymptomatic wāhine/people, 25 mm is commonly used as the cut-off to define a 'short' cervix and should be considered for preventative therapy.¹

In symptomatic wāhine/people, 15 mm is commonly used as the cut-off to define who is at an elevated risk of imminent birth and should receive treatments to prepare for preterm birth.

Figure 1: A normal reference range for cervical length 16–36 weeks, based on more than 6500 transvaginal cervical length measurements taken as part of routine clinical care in singleton pregnancies. Reference: Salomon 2009.⁵



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Preparation for transvaginal cervical length scan

Clinical details

The following information should be obtained:

- Confirm patient identity: name and date of birth
- EDD and gestational age
- Risk factors for spontaneous preterm birth
- Presence of a cervical cerclage
- Presence of signs or symptoms of concern including vaginal bleeding, leakage of fluid, abnormal vaginal discharge and abdominal pain/contractions.

Contraindications

There are some clinical situations where transvaginal scan is usually avoided, including:

- Preterm pre-labour rupture of membranes (PPROM)
- Active bleeding associated with known placenta praevia
- Vaginal obstruction e.g. from female genital mutilation

Consent

Transvaginal ultrasound is a sensitive examination and must always be performed with informed consent. Verbal information regarding the role and rationale of the scan should be provided before entering into the scan room. Provision of written information prior to attendance at a Preterm Birth Clinic or antenatal visit may also help prepare wāhine/people. Consent can be confirmed verbally (and documented within the written report).

Setting

Wāhine/people should be offered the presence of a chaperone during the examination. A chaperone should be a member of the clinical team but the presence of whānau as additional support should also be facilitated, if in line with the wāhine/person's wishes.

Consideration should be given to differences in cultural and personal backgrounds (including gender identity, history of sexual trauma, and female genital mutilation), and feelings of whakamā (embarrassment) that can influence the experience of a sensitive examination.

Measures should be taken to ensure that the examination is physically and emotionally comfortable. This includes privacy to get undressed, providing a sheet/blanket to cover themselves, and ensuring they are aware that the examination can be paused/stopped at any time if they are uncomfortable.

Empty bladder

Transvaginal cervical length assessment should always be performed with an empty bladder, as a full bladder can artificially elongate the cervical length measurement. Wāhine/people should be asked to empty their bladder just prior to commencing the ultrasound scan.

Positioning

The wāhine/person should be supine with the head of the examination table slightly elevated and/or provision of a pillow for head support. The lower limbs should be abducted at the hips and flexed at the knees with heels together. Use of a wedge or equivalent e.g. folded mattress, placed at the level of the pelvis will help to achieve an appropriate angle to insert the transvaginal probe and to enable adjustment of the probe in an anteverted orientation if required for visualisation of the cervix.

How to perform the scan

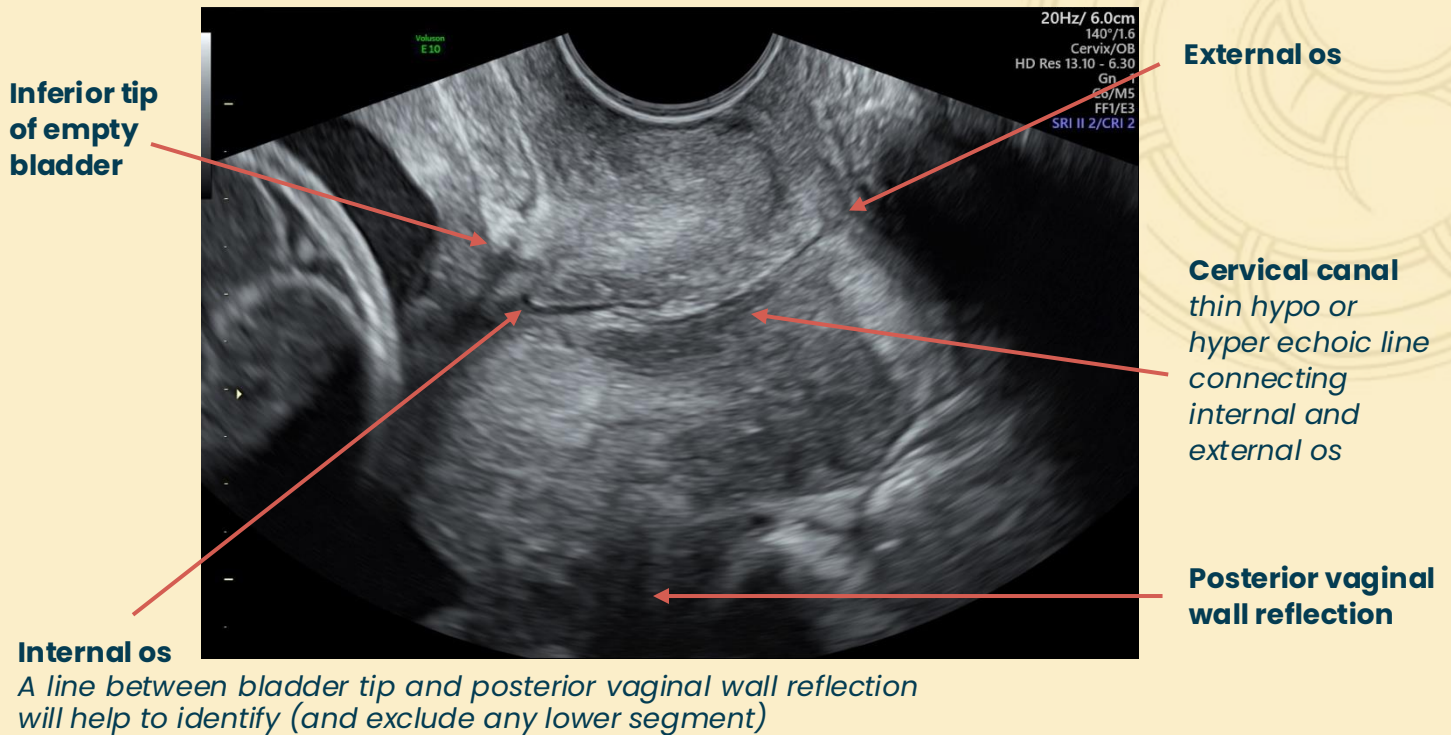
Transducer selection

- Use a high-frequency transvaginal transducer.
- Place transducer gel onto the end of the probe, then place a disposable probe cover over the top. Take care to avoid trapping air bubbles under the probe cover as this will create shadowing.
- Place a generous amount of lubricating jelly (KY jelly or equivalent) on top of the probe cover just prior to insertion.

Transducer placement

- Place the ultrasound probe into the anterior fornix of the vagina in longitudinal axis orientation to obtain a sagittal view.
- Gentle pressure may be required to identify the structures of interest.

Identifying the cervix: the landmarks



Minimise pressure

- Once the landmarks have been accurately identified, minimise probe pressure so that both cervical lips have the same width, keeping all structures in the image.
- Excessive probe pressure will artificially elongate the cervical length and can obscure other clinically important features such as funneling.

Magnification

- A less magnified image should initially be taken, to provide a broad overview of the cervix in relation to the vagina, gestation sac and fetus.
- The cervix should then be magnified, so that the cervix occupies 50–75% of the image. This is achieved by decreasing the depth.

Measurement of cervical length

The cervix is a dynamic structure and the length may vary with time and the presence of contractile activity in the uterine muscle. At least three measurements should be taken with the shortest technically correct measurement used. The duration of the ultrasound assessment should be three to five minutes, and ideally a series of measurements of cervical length should span over this time period.

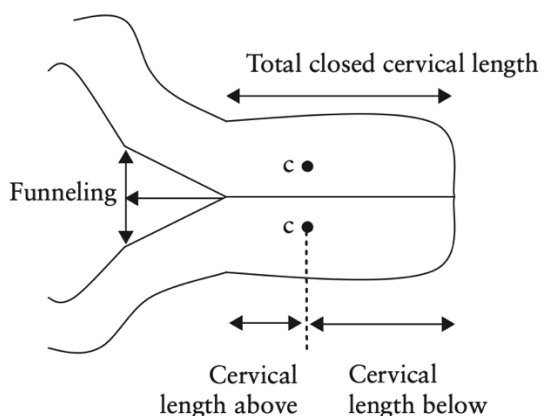


Figure 2: Schematic representation of transvaginal cervical length assessment, including in the presence of a cervical cerclage. Reference: ISUOG 2022.¹

- The calipers should be placed at the internal and external os, obtaining a straight line measurement.
- If there is funneling present, the caliper for the internal os should be placed at the apex of the funnel/fetal membranes.
- If the cervix is very curved, measuring its length in a straight line may under-estimate its true length, so it can be measured in two straight lines instead if a straight line measurement is initially suspected to be short (<25 mm). A genuinely short cervix will always be straight.
- Suprapubic and fundal pressure should be applied to assess for change in cervical length. If the closed cervix shortens with pressure, the length should be measured and reported with and without pressure.
- If a cervical cerclage is present, the total length of closed cervical length should be measured and reported, along with the length of closed length above the cerclage.

Additional findings

- The presence of the fetal heartbeat should be recorded. In early gestation this can usually be achieved via the transvaginal scan but at more advanced gestations e.g. >20 weeks, a transabdominal approach may be required.
- A subjective assessment of liquor volume should also be performed and recorded. If the liquor volume appears low, a measurement of the single deepest pocket of liquor should be taken.
- The location of the placenta should be noted and if appears to be low, the distance between the placental edge and the internal os can be measured. Vasa previa, placenta previa or low-lying placenta can be diagnosed and should be reported if seen with a follow-up scan recommended.
- Fetal presentation may be relevant if the cervix is short >22 weeks and should be noted.
- Presence of funneling, defined as effacement of the internal aspect of the cervix with protrusion of the amniotic membranes into the cervical canal, should be noted if present. Funneling does not add to prediction beyond that of cervical length,² however, knowledge of the presence/absence of funneling is helpful if a cervical cerclage is being considered.
- Intra-amniotic debris (also known as sludge) is echogenic material that may be seen within the amniotic fluid close to the internal os or within a funnel. The presence of debris is an independent risk factor for spontaneous preterm birth, PPROM and histological chorioamnionitis.^{7,8} However, there is no consensus regarding any changes to diagnostic tests or treatment when debris is present.¹

Reporting cervical length

The following should be included in the report for a cervical length scan:

- Ultrasound approach i.e. transvaginal, translabial.
- Shortest closed cervical length in mm.
- Presence/absence of change with suprapubic/fundal pressure. If the cervix shortens with pressure, the length should be reported with and without pressure.
- If a cervical cerclage is present, the total closed cervical length, as well as the closed length above the level of the cerclage.
- Presence/absence of funneling.
- Presence of fetal heart activity.
- Fetal presentation, especially if >22 weeks and the cervix is short.
- Any abnormalities of the placenta if seen e.g. low-lying placenta or placenta praevia, vasa praevia, or other additional findings e.g. intra-amniotic debris.

References

1. Coutinho CM, Sotiriadis A, Odibo A, Khalil A, D'Antonio F, Feltovich H, et al. ISUOG Practice Guidelines: role of ultrasound in the prediction of spontaneous preterm birth. *Ultrasound Obstet Gynecol.* 2022;60(3):435–56. DOI: 10.1002/uog.26020.
2. The Royal Australian and New Zealand College of Obstetricians and Gynaecologists. Measurement of Cervical Length for Prediction of Preterm Birth: The Royal Australian and New Zealand College of Obstetricians and Gynaecologists.; 2021.
3. Sotiriadis A, Papatheodorou S, Kavvadias A, Makrydimas G. Transvaginal cervical length measurement for prediction of preterm birth in women with threatened preterm labor: A meta-analysis. *Ultrasound Obstet Gynecol.* 2010;35(1):54–64. DOI: 10.1002/uog.7457.
4. Heath VCF, Southall TR, Souka AP, Elisseeu A, Nicolaides KH. Cervical length at 23 weeks of gestation: Prediction of spontaneous preterm delivery. *Ultrasound in Obstetrics & Gynecology.* 1998;12(5):312–7. DOI: s10.1046/j.1469-0705.1998.12050312.x.
5. Iams JD, Goldenberg RL, Meis PJ, Mercer BM, Moawad A, Das A, et al. The length of the cervix and the risk of spontaneous premature delivery. *New England Journal of Medicine.* 1996;334(9):567–73. DOI:10.1056/nejm199602293340904.
6. Salomon LJ, Diaz-Garcia C, Bernard JP, Ville Y. Reference range for cervical length throughout pregnancy: Non-parametric LMS-based model applied to a large sample. *Ultrasound Obstet Gynecol.* 2009;33(4):459–64. DOI: 10.1002/uog.6332.
7. Saade GR, Thom EA, Grobman WA, Iams JD, Mercer BM, Reddy UM, et al. Cervical funneling or intra-amniotic debris and preterm birth in nulliparous women with midtrimester cervical length less than 30 mm. *Ultrasound in Obstetrics & Gynecology.* 2018;52(6):757–62. DOI: 10.1002/uog.18960.
8. Yoneda N, Yoneda S, Niimi H, Ito M, Fukuta K, Ueno T, et al. Sludge reflects intra-amniotic inflammation with or without microorganisms. *Am J Reprod Immunol.* 2018;79(2). DOI: 10.1111/ajri.12807.

For more information including access to *Taonga Tuku Iho* (national best practice guide), you can access the Carosika Collaborative website www.carosikacollaborative.co.nz or by using the QR code.

