Welcome to the Pregnancy Medical Home “First Tuesdays” Webinar:

Prevention of Preterm Birth: Cervical Ultrasound Screening

Webinar will begin at 7:30am
Please connect to audio by computer
Submit any questions through chat

Funding for this project is provided in part by The Duke Endowment
NC Preterm Birth Prevention TeleHealth Network – 2014

- Partnership
  - UNC Center for Maternal and Infant Health
  - UNC School of Medicine Division of Maternal-Fetal Medicine
  - Community Care of North Carolina’s Pregnancy Medical Home Program

- Statewide initiatives:
  - CLEAR certification for sonographers in cervical length measurement
  - Evidence based clinical guidance for OB providers: Pregnancy Medical Home Pathways and related materials

- Pilot initiatives within CCNC’s AccessCare Network:
  - Practice-based technical assistance to address tobacco use in pregnancy
  - MFM telemedicine consultation in 10 rural prenatal care settings

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Pregnancy Medical Home Care Pathways

- CCNC network OB champions collaborate to create evidence-based clinical guidance for maternity care providers
- Promote best practices, improve quality and outcomes

- PMH webpage on CCNC’s website

www.communitycarenc.org/population-management/pregnancy-home/
Today’s session

Prevention of Preterm Birth: Cervical Ultrasound Screening

Upcoming Webinars:

- November 3: Progesterone and Management of Patients with History of Spontaneous Preterm Birth
- December 1: Management of Obesity in the Perinatal Period

Funding for this project is provided in part by The Duke Endowment
Prevention of Preterm Birth: Cervical Ultrasound Screening

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Funding for this project is provided in part by The Duke Endowment
Learning Objectives

- Cervical length measurement as a predictor of preterm birth
- Treatment options for short cervix
- Implementation
  - Principles of ultrasound to assess cervical length
  - Programmatic support in North Carolina
    - Sonographer certification in cervical length measurement
    - Coding and billing

Funding for this project is provided in part by The Duke Endowment
Infants born <37 weeks (12% of births)
- 13,410 infants
  - 1:8 overall
  - 1:6 African American infants

Infants born <26 weeks
- 806 infants
LBW and VLBW among Deliveries to Women with Prenatal Medicaid

Low Birth Weight (<2500 grams) Among Deliveries to Women with Prenatal Medicaid

- 6.7% decline in LBW in first three years of PMH program.

Very Low Birth Weight (<1500 grams) Among Deliveries to Women with Prenatal Medicaid

- 15.2% decline in VLBW in first three years of PMH program.
Prevention of sPTB

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History of spontaneous preterm birth (<37 weeks) or 2nd trimester pregnancy loss?

- Yes
  - Consider MFM/high-risk OB consult
  - Obtain MFM/high-risk consult if history of spontaneous preterm birth <32 weeks or 2nd trimester loss
  - Current singleton pregnancy?
    - Yes
      - Recommended Intramuscular progesterone (see Box 2)
      - Measure cervical length every two weeks by transvaginal ultrasound from 15-16 weeks to 23-24 weeks or weekly if cervical length <30mm or if internal os abnormalities
      - If cervical length <25mm, consider antibiotic prophylaxis
      - If history of spontaneous preterm birth <34 weeks or 2nd trimester loss in a multiple gestation, obtain MFM/high-risk OB consult for progesterone recommendation
    - No
      - Usual care for multiple gestation

- No
  - Measure cervical length by abdominal ultrasound at 16-24 weeks
  - Cervical length <30mm and/or internal os abnormality?
    - Yes
      - Confirm findings by transvaginal ultrasound
      - Recommend vaginal progesterone (see Box 1) if cervical length <25mm
      - Repeat cervical length measurement by transvaginal ultrasound in 1-2 weeks until 23-24 weeks
      - If progressive shortening or worsening of funnel, obtain MFM/high-risk OB consult
    - No
      - Usual care

Usual Care
Cervical effacement and Dilation

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Cervical Effacement: Inside Out

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Assessing Cervical Length

Options for assessing Cervical Length include

- Digital Examination
  - Unable to see intraamniotic debris or choriodecidual separation
- Transabdominal Ultrasound
  - Factors that may affect reliability include obesity, fetal shadowing, and cervix position
- Transvaginal Ultrasound
  - Shown to be safe, reliable, and reproducible
What Defines a Good Screening Test?

Disease

Clinically important, clearly defined, with a well known prevalence and recognizable early asymptomatic phase

Technique

Well described, safe and acceptable, has a reasonable cutoff identified, reproducible results (reliable), and accurate results (valid)

Intervention, cost-effectiveness and feasibility

Early intervention is effective, screening and treating abnormals is cost-effective, facilities for screening and treatment are readily available
Intervention for Short Cervix is Effective

Vaginal progesterone (90mg gel)

- RCT n=32,091 screened, n=458 randomized
- High and low risk women with CL 10-20 mm
- Reduced risk by 45%

Hassan, Ultrasound Obstet Gynecol 2011;38:18

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Intervention for Short Cervix is Effective

Vaginal progesterone (200mg suppository)

- RCT n=24,620 screened, n=250 randomized
- High and low risk women with CL ≤15 mm
- Reduced risk by 44%


Figure 2. Kaplan-Meier Plot of the Probability of Continued Pregnancy without Delivery among Patients Receiving Vaginal Progesterone as Compared with Placebo.

Progestosterone reduces the risk of spontaneous delivery before 34 weeks by 44.2% (hazard ratio for progesterone, 0.57; 95% CI, 0.35 to 0.92; P=0.02). P=0.49 for the test of the proportional-hazards assumption.
<table>
<thead>
<tr>
<th>Population</th>
<th>Recommendation regarding use of progestogens</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asymptomatic</strong></td>
<td></td>
</tr>
<tr>
<td>Singletons without prior SPTB and unknown or normal TVU CL</td>
<td>No evidence of effectiveness</td>
</tr>
<tr>
<td>Singletons with prior SPTB</td>
<td>17P 250 mg IM weekly from 16-20 wk until 36 wk</td>
</tr>
<tr>
<td>Singletons without prior SPTB but CL ≤20 mm at ≤24 wk</td>
<td>Vaginal progesterone 90-mg gel or 200-mg suppository daily from diagnosis of short CL until 36 wk</td>
</tr>
<tr>
<td>Multiple gestations</td>
<td>No evidence of effectiveness</td>
</tr>
<tr>
<td><strong>Symptomatic</strong></td>
<td></td>
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<tr>
<td>PTL</td>
<td>No evidence of effectiveness</td>
</tr>
<tr>
<td>PPROM</td>
<td>No evidence of effectiveness</td>
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</tbody>
</table>

17P, 17-alpha-hydroxy-progesterone caproate; CL, cervical length; IM, intramuscularly; PPROM, preterm premature rupture of membranes; PTL, preterm labor; SPTB, spontaneous preterm birth; TVU, transvaginal ultrasound.

Regardless of whether practitioners choose to screen universally or selectively, correct technique is critical to avoiding incorrect diagnosis and treatment.

Transvaginal Cervical Sonography

Illustration by James Cooper MD
Normal Cervix

- Fetal Head
- Bladder Empty
- Internal Os
- Ext Os
- Posterior Cervix

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Trans-Abdominal Pitfalls

- Fetal parts may obscure cervix
- Bladder filling may elongate cervix and mask funnel
- Long distance from probe decreases resolution
- Manual pressure may compress lower uterine segment and mimic cervix
Transabdominal Image
CL = 37 mm.

Transvaginal Image
Same patient
CL = 25 mm.

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Cervical Screening Measurement Image Criteria

- Transvaginal Image
- Cervix ~ 75% of the image
- Anterior = Posterior Width
- Maternal Bladder Empty
- Internal Os Seen
- External Os Seen
- Cervical Canal Visible throughout
- Caliper Placement Correct
- Cervix Mobility Considered

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Anterior Width ≠ Posterior Width
Internal and External Os Well Seen
Too much pressure:
Neither os seen well
External Os Not Well Seen
Where to Put the Calipers?

- Where the anterior & posterior walls of the canal touch
- Not outer-most edge
- Spend enough time to see whether a small echolucent area is stable, or is going to open up

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B = Funnel  A = Cervix Length

Cervix Length ≠ A + B

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How to Measure the Curved Cervix:
Use Multiple Measurements
Dynamic Technique

- Withdraw probe until blurred / Reapply
- Enlarge image (2/3 of screen)
- Measure Ext Os → Int Os along endo-cervical canal
- Apply fundal or suprapubic pressure
- Obtain 3 measurements, use shortest best

Berghella, Clin Obstet Gynecol 2003;46:947
Other Factors Affecting Cervical Measurement

Gestational age:

Lower segment of uterus may be difficult to distinguish from cervix until somewhere between 16 and 20 weeks

If can’t tell at 16-18, ask her to come back at 18-20 wks

Duration of scan – A scan < 3 minutes is inadequate

OPERATOR experience & training

Standardize method
Preterm Birth History/ Cervical Length Screening Flowchart

History of spontaneous preterm birth (<37 weeks) or 2nd trimester pregnancy loss?

No

Measure cervical length by abdominal ultrasound @ 16-24 weeks

Cervical length <30mm and/or internal os abnormality?

No

Usual Care

- Confirm findings by transvaginal ultrasound
- Recommend vaginal progesterone (see Box 1) if cervical length <25mm
- Repeat cervical length measurement by transvaginal ultrasound in 1-2 weeks until 23-24 weeks
- If progressive shortening or worsening of funnel, obtain MFM/high-risk OB consult

Yes

Flowchart
Vaginal Progesterone

- Available preparations currently covered by NC Medicaid
  - Prometrium® 200mg
  - Crinone® 8% gel, 90mg
  - per vagina nightly
- Continue through 36th week of pregnancy
Cervical Length Education and Review Course
Available online through the Perinatal Quality Foundation at
https://clear.perinatalquality.org/

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Financial Support for CLEAR Certification

- Funding available for CLEAR Certification 180 sonographers in North Carolina through North Carolina Preterm Birth Prevention TeleHealth Network
- Priority to support sonographer certification in underserved areas of the state, with opportunities throughout North Carolina as resources are available
- For additional information or if you have questions, please contact:

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Questions?

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References