Overview

- Epidemiology and Risk Factors
- Prevention
- Diagnosis
- Management
Epidemiology

- Definition: Contractions causing cervical change before 37 weeks
- A major public health problem and focus of research
  - 12.7% of births in 2005\(^1\)
  - 20% increase since 1990, mostly late preterm 34-36 wk
  - In Providence, 13.7% of births in 2010\(^2\)
  - 35% of all US healthcare dollars spent on infants\(^3\)
- \(\frac{1}{2}\) cases are spontaneous labor without ROM, \(\frac{1}{4}\) are PPROM, \(\frac{1}{4}\) are iatrogenic\(^1\)
  - Iatrogenic causes include IUGR, placental abruption, hypertensive disorders, non-reassuring fetal testing\(^1\)

2. 2012 Rhode Island Kids Count Factbook, Preterm Births
Epidemiology

- Rates of preterm delivery steady below 34 weeks
- Rising rates at 34-36 weeks (iatrogenic)

![Preterm Delivery Rates in the United States](image)

Risk Factors

- Maternal Characteristics
  - Race
    - African American > Hispanic > White non-Hispanic
  - Short interpregnancy interval (<6mo)
  - Physical or mental stress
  - BMI <19
  - Delayed first pregnancy and use of reproductive assisted technology
  - Previous preterm delivery

Risk Factors

- Pregnancy Characteristics
  - BV or chlamydia infection
  - Other intrauterine infection
  - Other systemic infection (pyelo, appendicitis, PNA)
  - Periodontal disease
  - Cocaine, heroin, tobacco use
  - Hx of cervical cone biopsy or LEEP
  - Short cervix for other reasons (<3cm)
  - Maternal abdominal surgery
  - Medical problems (DM, thyroid, HTN disorders)
  - Multiple gestation
  - Uterine anomalies
  - Placental abruption or placenta previa

Outcomes

- Majority of preterm births and NICU admits are 34-36 weeks for respiratory problems.
- At <32 weeks mortality increases significantly.
Prevention

- So many causes- difficult to prevent
- Smoking cessation programs successful
- Tx for asymptomatic bacteruria successful
- Screening and treatment for BV controversial
  - USPSTF- Insufficient evidence to screen or treat for low or high risk populations
  - If someone has symptomatic BV, oral clinda or metronidazole should be used to tx
  - If someone has a history of preterm birth, consider screening for BV at first prenatal visit and treating if positive

Prevention

- Progesterone successful\(^4\)
  - 17P NICHD study 2003
    - 459 women with prior preterm birth started weekly injections at 16-20 weeks
    - Reduced preterm birth, low birth weight and complications of prematurity with no adverse effects
  - Variable effects of vaginal progesterone at different dosages
  - No effect in a twin study
  - Variable effects with short cervical length and no hx preterm birth

- ACOG recommends only for women with hx of preterm birth\(^4\)
  - “May be considered” for women with incidental finding of a short cervical length ≤15 mm, but it is not recommended to check cervical length routinely
Diagnosis

- FAST ACTION IS KEY
  - Only 30-60% of women presenting with preterm labor will lead to a preterm birth\(^1,3\)
  - 3 main areas of concern that make a difference in survival of infant
    - Transfer to hospital with NICU capabilities
    - GBS prophylaxis
    - Administration of steroids

### Table 3. Initial Assessment of Patients with Premature Contractions

<table>
<thead>
<tr>
<th>Assessment questions</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the gestational age?</td>
<td>Verify dates by clinical history and ultrasonography</td>
</tr>
<tr>
<td>Are the membranes ruptured?</td>
<td>History of leaking fluid; observed leakage of fluid from cervical os on sterile speculum examination; nitrazine-positive reaction of fluid; ferning of fluid; ultrasonography for oligohydramnios; amnioinfusion of indigo carmine, if available</td>
</tr>
<tr>
<td>Is the patient in labor?</td>
<td>Observe for contractions accompanied by cervical effacement and dilation</td>
</tr>
<tr>
<td>Is there an infection?</td>
<td>Group B streptococcus carrier status; urinary tract infection; bacterial vaginosis; trichomoniasis; gonorrhea or chlamydia</td>
</tr>
<tr>
<td>What is the likelihood that the patient will deliver prematurely?</td>
<td>Consider endovaginal ultrasonography of cervical length and/or fetal fibronectin testing</td>
</tr>
</tbody>
</table>
Initial management at MHRI

- Sterile speculum exam
  - Obtain FFN
  - Check for ferning
  - Check for possible infection (wet mount, GC/C, GBS)
  - Visualize cervical dilation and digital cervical exam
    - Consider avoidance of digital exam if pt with ROM and NOT actively contracting or uncomfortable
- UA and U tox
- EFM and toco monitoring
- IV fluids
- Call Women and Infants and arrange transfer if appropriate
Assessing cervical change

- FFN superior to contraction monitoring and cervical dilation in predicting labor in symptomatic patients
  - Negative predictive value 99% for delivery within 14 days
  - Positive predictive value 13-30% for delivery in 7-10 days
  - Can only be done if NOTHING in vagina in past 24 hours
  - False positives with amniotic fluid, blood, vaginal infection

Cervical Ultrasound

- More reliable with FFN than either alone
- Reassuring if >3cm (only 1% delivery in 7 days in 1 study)

Steroids for fetal lung maturity\(^1, 5\)
- Betamethasone 12mg IM daily x 2 doses
- Dexamethasone 6mg IM q 12hrs x 4 doses
- Decreases neonatal mortality, RDS, intraventricular hemorrhage
- ACOG currently does not recommend repeat steroids for those who end up not delivering
- However, Cochrane Review 2012- repeat steroids 7 days after initial course further reduces RDS without adverse outcomes\(^5\)

Antibiotics

- Meant for prevention of GBS sepsis in newborn\textsuperscript{1,3}

- CDC Recommended Regimens\textsuperscript{1}
  - Penicillin G: 5 million units IV, then 2/5 million units IV q 4 hours until delivery
  - Low risk PCN allergy: Cefazolin 2g IV, then 1g IV q 8 hours until delivery
  - High risk PCN allergy, GBS susceptibilities known: Clindamycin 900mg IV q 8 hours until delivery
  - High risk PCN allergy, GBS susceptibilities unknown: Vancomycin 1g IV q 12 hours until delivery

\textsuperscript{1} Sayres W. Preterm Labor \textit{American Family Physician} 2010;81:477-484.
\textsuperscript{3} ACOG Practice Bulletin 43, May 2003. Management of Preterm Labor
Tocolytics

- No preferred regimen, used primarily to allow time to give steroids\textsuperscript{1,3}
- Reduces birth within 48 hours but does not improve outcomes\textsuperscript{1}
- Contraindicated with active infection or maternal/fetal instability

Tocolytics

- Magnesium should be given under 32 weeks for neuroprotection\(^1,3,6\)
  - No data on which regimen works best
  - At MHRI we typically use 4g IV loading dose followed by 2g/hr infusion

- Indomethacin\(^1\)
  - Usually used under 32 weeks, after this concern for premature closure of ductus arteriosis
  - Loading dose 50-100mg PO, then 25mg PO q 4-6 hours
  - Okay to use with magnesium

Tocolytics

- **Nifedipine**\(^1,3\)
  - Usual first line agent after 32 weeks
  - 10mg PO q20 minutes up to 4 doses or 30mg PO loading dose followed by 10mg PO q 4 hours
  - Risk of hypotension; side effects include flushing, nausea, HA, dizziness
  - Caution with use with magnesium

- **Terbutaline**\(^1,3\)
  - 0.25mg SQ q 20 min
  - Risk of maternal and fetal tachycardia, pulmonary edema
  - Long term use contraindicated

Summary

- Preterm birth is a serious public health problem with no significant progress over past several years
- Risk factors are varied and apply to all populations
- Progesterone is effective in preventing preterm birth in women who have had prior preterm birth
- Timely management leads to better outcomes
- Steroids, antibiotics, and tocolytics to allow time for steroids are the mainstays of
Question 1

- Risk factors for preterm labor include all of the following EXCEPT:
  a. Low socioeconomic status
  b. Prior preterm birth
  c. Cocaine or tobacco use
  d. Young age
  e. Obesity
Question 1

- Risk factors for preterm labor include all of the following EXCEPT:
  a. Low socioeconomic status
  b. Prior preterm birth
  c. Cocaine or tobacco use
  d. Young age
  e. Obesity

Obesity is not a risk factor for preterm labor, in fact low BMI can be a risk factor.
The most important factors for the best neonatal outcomes in preterm labor include all of the following EXCEPT:

a. Transferring to an institution with a NICU
b. Tocolytics
c. Steroids for lung maturity
d. Antibiotics
The most important factors for the best neonatal outcomes in preterm labor include all of the following EXCEPT:

a. Transferring to an institution with a NICU
b. Tocolytics
c. Steroids for lung maturity
d. Antibiotics

There is no evidence that tocolytics improve neonatal outcomes, they are given to provide time for the other measures listed.
Which of the following interventions has been proven to prevent preterm labor in women with a history of preterm labor?

a. Monitoring cervical length ultrasounds from conception
b. Intensive psychosocial counseling
c. Progesterone
d. Screening for asymptomatic BV
Question 3

Which of the following interventions has been proven to prevent preterm labor in women with a history of preterm labor?

a. Monitoring cervical length ultrasounds from conception
b. Intensive psychosocial counseling
c. Progesterone
d. Screening for asymptomatic BV

Of the above listed interventions, only progesterone is evidence based and recommended by ACOG for prevention of preterm birth in women with a prior preterm birth.
A woman at 30 weeks gestation presents with contractions, what should be your first steps in management?

No multiple choice for this one: Talk it out with your senior resident and review the green book for management choices.
Question 5

- You confirm that this woman at 30 weeks is making cervical change and has a positive FFN. What tocolytic is best to give?
  a. Nifedipine
  b. Indomethacin
  c. Terbutaline
  d. Magnesium
You confirm that this woman at 30 weeks is making cervical change and has a positive FFN. What tocolytic is best to give, especially if you are planning to use an additional medication for CP prophylaxis?

a. Nifedipine  
b. Indomethacin  
c. Terbutaline  
d. Magnesium

Indomethacin is the preferred tocolytic under 32 weeks. While magnesium should also be given for CP prophylaxis, it is not as effective as indomethacin for tocolysis.
Question 6

- In addition to a tocolytic, what other medications should this patient get prior to transfer. Choose any that apply:
  - a. Penicillin
  - b. Gentamicin
  - c. Clindamycin
  - d. Betamethasone
  - e. Prednisone
In addition to a tocolytic, what other medications should this patient get prior to transfer. Choose any that apply (she does not have drug allergies):

- Penicillin
- Gentamicin
- Clindamycin
- Betamethasone
- Prednisone

This patient should also receive GBS prophylaxis with penicillin and steroids for fetal lung maturity prior to/during transfer. Prednisone does not cross the placenta.


