Preterm Labor Assessment Toolkit

Development Partners:

Adapted from the 2005 Preterm Labor Assessment Toolkit developed by Sutter Medical Center, Sacramento under a grant provided by the March of Dimes California Chapter
Disclaimer

- The March of Dimes is not engaged in rendering medical advice or recommendations.
- The American College of Obstetricians & Gynecologists (ACOG) Committee on Obstetric Practice supports this toolkit; however, it is for informational purposes only and may not entirely reflect ACOG guidelines.
- The procedures and policies outlined in this toolkit were provided by various health care providers and reviewed and modified for use in this manual.
- It is important that any procedure or policy reflect the practice within an institution, so please review the content presented carefully and revise as applicable to your facility.
Preterm Labor Assessment Toolkit (PLAT) Goal

To improve perinatal health outcomes by establishing a standardized clinical pathway for the assessment and disposition of women with suspected signs and symptoms of preterm labor.
Objectives

• Define ‘Toolkit’
• Understand the scale and impact of preterm birth
• Understand how timely assessment can improve neonatal and long-term child health outcomes
• Understand how the March of Dimes Preterm Labor Assessment Toolkit improves quality of care through evidence-based, standardized pathways
PLAT Overview: What Is a “Toolkit”?

**Toolkit:** All-inclusive package to help facilitate improved clinical outcomes, excellent patient care and efficient resource allocation. (CPQCC.org)

**PLAT:** Package of resources you need to standardize preterm labor assessment at your hospital.

**Core Contents of PLAT:**
1. Overview: Preterm labor assessment and clinical disposition of patients
2. Algorithm, Protocol and Order Set
3. Data Collection: Suggested measures and data sources
4. Standardization of preterm labor assessment as a quality improvement project
5. Patient education and home care instructions
Preterm Birth in the United States

Preterm birth (<37 completed weeks)
- 11.7% of all 2011 live births
  - over 460,000 babies

Late preterm (34 to 36 weeks)
- 8.3% of live births
  - about 328,000 babies

Early preterm (<34 weeks)
- 3.4% of live births
  - about 134,000 babies

Data shown is % of live births

National Center for Health Statistics, 1990-2011 Final Natality Data,
What Are the Consequences of Preterm Birth?

Health Impact
More than one-third of deaths during the first year of life are attributed to preterm birth-related causes.

Lifelong complications, including:
• cerebral palsy
• developmental delays
• chronic lung and vision problems

Economic Impact
Annually, preterm birth costs:
• An average of $52,000 per premature infant
• $26 billion for the U.S.
• Costs include health care, education and lost productivity

What Are the Causes of Preterm Birth?

- Spontaneous Preterm Labor 40-45%
- Preterm Premature Rupture of Membranes (PPROM) 30-35%
- Indicated 30-35%

Definition of Preterm Labor

Preterm labor occurs between 20 and 36 6/7 weeks of pregnancy. It is generally based on clinical criteria of:

- Regular uterine contractions with or without ruptured membranes accompanied by:
  - Initial presentation with cervical dilation of at least 2 cm OR
  - Change in cervical exam (dilation and/or effacement) on serial exams

Identifying women with preterm labor who ultimately give birth prematurely is difficult.
- Approximately 50% of women hospitalized for preterm labor actually deliver at term.

Risk Factors for Preterm Delivery

Greatest risk
• Previous preterm birth
• Multiple gestation
• Cervical or uterine anomalies
• Presence of fFN between 22 and 34 weeks gestation
• Cervix <25 mm long by TVU between 20 and 28 weeks

Medical risks
• Infections
• Diabetes
• Hypertension
• Thrombophilias
• Vaginal bleeding
• Birth defects
• IVF
• Underweight or obesity
• Short pregnancy interval

Lifestyle and environmental risks
• Late or no prenatal care
• Cigarette smoking, drinking alcohol, drug use
• Lack of social support
• Stress
• Long working hours with prolonged standing

Other
• African-Americans and American Indians
• <17 or >35 years of age
• Low socioeconomic status (SES)
### Risk of Subsequent Preterm Delivery

<table>
<thead>
<tr>
<th>First Delivery</th>
<th>Second Delivery</th>
<th>Risk of Subsequent Preterm Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term</td>
<td>_</td>
<td>5%</td>
</tr>
<tr>
<td>Preterm</td>
<td>_</td>
<td>15%</td>
</tr>
<tr>
<td>Term</td>
<td>Preterm</td>
<td>24%</td>
</tr>
<tr>
<td>Preterm</td>
<td>Preterm</td>
<td>33%</td>
</tr>
</tbody>
</table>

Interventions That Do Not Reduce Risks of Preterm Birth

ACOG states that the following do not appear to reduce the risk of preterm birth and should not be routinely recommended for women with signs and symptoms suggestive of preterm labor:

- Bedrest
- Hydration
- Pelvic rest

Interventions That Do Reduce Risks Associated with Preterm Birth

Preventing preterm birth:

• Progesterone for asymptomatic women with preterm birth risk factors (e.g., prior preterm birth and/or short cervical length measured by TVU)
• Cerclage (for a limited number of special situations)

Preparing for preterm birth can improve outcomes:

• Antenatal corticosteroids
• Short-term tocolytic agents
• Transport to a tertiary care facility
### Why This Matters: Benefits of Antenatal Corticosteroids (ACS) Between 24 and 34 Weeks

Antenatal corticosteroids led to reduction in:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonatal death (NND)</td>
<td>~ 30%</td>
</tr>
<tr>
<td>Respiratory distress syndrome (RDS)</td>
<td>~ 35%</td>
</tr>
<tr>
<td>Intraventricular hemorrhage (IVH)</td>
<td>~ 50%</td>
</tr>
<tr>
<td>Cerebroventricular hemorrhage</td>
<td>~ 50%</td>
</tr>
<tr>
<td>Necrotizing enterocolitis (NEC)</td>
<td>~ 55%</td>
</tr>
<tr>
<td>NICU admissions</td>
<td>~ 20%</td>
</tr>
<tr>
<td>Early systemic infections</td>
<td>~ 50%</td>
</tr>
</tbody>
</table>

Roberts D, Dalziel S. Cochrane Database of Systematic Reviews 2006; Issue 3
ACS Use

The Joint Commission Perinatal Care Core Measure-03 Antenatal Steroids

• Patients at risk of preterm delivery at 24 to 32 weeks gestation receiving antenatal steroids prior to delivering preterm newborns

ACOG

• “The most beneficial intervention for patients in true preterm labor is the administration of corticosteroids.”
• Recommended between 24 weeks and 34 weeks gestation when risk of preterm delivery is within 7 days

Performance on Antenatal Steroid Measure

Despite 15 years of provider education efforts, 1 in 4 very premature babies still fail to receive the benefits of ACS

<table>
<thead>
<tr>
<th>Birthweight (g)</th>
<th>Cases</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>&lt;501</td>
<td>2321</td>
<td>43.0%</td>
</tr>
<tr>
<td>501-600</td>
<td>3423</td>
<td>62.3%</td>
</tr>
<tr>
<td>601-700</td>
<td>4277</td>
<td>74.2%</td>
</tr>
<tr>
<td>701-800</td>
<td>4615</td>
<td>77.9%</td>
</tr>
<tr>
<td>801-900</td>
<td>4816</td>
<td>77.6%</td>
</tr>
<tr>
<td>901-1000</td>
<td>5075</td>
<td>79.3%</td>
</tr>
<tr>
<td>1001-1100</td>
<td>5321</td>
<td>78.8%</td>
</tr>
<tr>
<td>1101-1200</td>
<td>5689</td>
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<td>1201-1300</td>
<td>6036</td>
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<tr>
<td>1301-1400</td>
<td>6689</td>
<td>75.9%</td>
</tr>
<tr>
<td>&gt;1400</td>
<td>8556</td>
<td>73.1%</td>
</tr>
<tr>
<td><strong>All</strong></td>
<td>56,818</td>
<td>74.5%</td>
</tr>
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</table>

Contractions: A Diagnostic Challenge

- The assessment of preterm delivery risk based solely on symptoms and physical examination may be inaccurate.
- Uterine contractions alone are a poor positive predictor of true preterm labor.
- Contractions will occur four or more times an hour in up to 25% of pregnancies <32 weeks.
- Many women diagnosed with preterm labor based solely on the high-threshold criterion of six or more uterine contractions per hour will deliver at term.

Iams JD, Berghella V. Am J Obstet Gynecol 2010;203:89-100.
Management of Preterm Contractions

Hospital triage units tend to be inconsistent, with high variation in assessment and management of women with symptoms of preterm labor.

Treatment of 239 women presenting with preterm contractions at a network of 11 Wisconsin non-level III hospitals.

Findings:

- The average gestational age was 31.9 weeks
- Only 17% of patients had any cervical changes with contractions.
- **Over**-treated low-risk patients
  - 76% of those without cervical changes received short-term tocolytics.
- **Under**-treated high-risk patients
  - Only 33% of those who delivered <34 weeks gestation received ACS

If Contractions Are Confusing, What Can We Do?

Standardized assessment improves accurate diagnosis of preterm labor.

Without standardization

- Ineffective use of available tools and interventions
- 50 to 80% of women admitted for preterm labor are discharged and ultimately deliver at term

With standardization

- Reduced antepartum admissions and length of stay
- Reduced tocolytics
- Increased antenatal steroid use
- Cost savings

Preterm Labor Assessment for Symptomatic Women
Standardized Pathway for Improving Outcomes

1. Woman presents at hospital with the signs & symptoms of preterm labor
2. Appropriate patient assessment by clinicians (SSE, SVE, TVU, fFN)
3. If no cervical change:
   - Discharge home undelivered with educational materials
4. If cervical change:
   - Appropriate disposition decision
   - Antenatal corticosteroids
   - Tocolytic therapy (if appropriate)
   - Admit or transport
Value of Standardized Assessment

• Identifying those patients in true labor will benefit all women who present in triage with signs and symptoms of suspected preterm labor.

• Hospitals providing all levels of care will achieve the following outcomes within a relatively brief timeframe:
  - Timely and appropriate interventions
  - Optimal maternal-fetal safety
  - Hospitalization of only those patients at greatest risk for preterm delivery
  - Effective transport of preterm labor patients to higher, more appropriate levels of care
  - Avoidance of unnecessary treatments, interventions and medications
Tools to Standardize Assessment

Standardized assessment to diagnose preterm labor:
• Consistent definition by clinical criteria as regular uterine contractions accompanied by presentation with cervical dilation of at least 2 cm or a change in cervical exam (dilation and/or effacement) on serial exam.

Standardized assessment of risk factors associated with preterm birth:
• Consistent use of objective information to assess symptomatic women who do not meet the clinical criteria for preterm labor noted above.
• Examples include prior preterm birth as well as risk assessment via Transvaginal Ultrasound (TVU) and Fetal Fibronectin test (fFN)

Transvaginal Ultrasound (TVU)

Cervical length was measured at 24 weeks.

Probability of Preterm Delivery (%)


Preterm Delivery <35 Weeks

Cervical length was measured at 24 weeks.

Used with permission from Andrea Jelks, MD, Santa Clara Valley Medical Center
Accurate transvaginal ultrasound requires appropriate training and technique.

Correct technique with "abnormal" finding 17 seconds later.
TVU — Contraindications and Limitations

• Invalid <15 weeks and >28 weeks
• Steep learning curve — inability to recognize landmarks
• Vaginal bleeding (some instances)
• Central placenta previa
• Excessive probe pressure
• Filled maternal bladder
• Limited access to appropriate TVU equipment and trained staff in some hospitals
TVU — Predicting Probability of Preterm Birth in Women with Prior Preterm Birth

At 26 weeks, a cervical length of 15 mm is associated with 16.2% risk of delivery prior to 32 weeks, while a 45 mm length has only 1.5% risk.

<table>
<thead>
<tr>
<th>Cervical length, mm</th>
<th>Week of pregnancy</th>
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<tbody>
<tr>
<td></td>
<td>15</td>
</tr>
<tr>
<td>0</td>
<td>76.3</td>
</tr>
<tr>
<td>5</td>
<td>67.9</td>
</tr>
<tr>
<td>10</td>
<td>58.1</td>
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<tr>
<td>15</td>
<td>47.7</td>
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<tr>
<td>20</td>
<td>37.4</td>
</tr>
<tr>
<td>25</td>
<td>28.2</td>
</tr>
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<td>30</td>
<td>20.5</td>
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<td>35</td>
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<td>45</td>
<td>6.8</td>
</tr>
<tr>
<td>50</td>
<td>4.6</td>
</tr>
<tr>
<td>55</td>
<td>3.0</td>
</tr>
<tr>
<td>60</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Reproduced with permission.
Fetal fibronectin (fFN) Test

- Fetal fibronectin (fFN) is a biomarker screen associated with preterm birth
- In normal pregnancies between 22 to 35 weeks gestation, fFN is generally undetectable in cervico-vaginal secretions
- A positive fFN is associated with increased risk (13%-40%) of delivery within 14 days
- A negative fFN is associated with low risk (0.5%-5%) of delivery within 14 days
- The data of Positive Predictive Value and Negative Predictive Value can assist with risk assessment and provider decision-making regarding risk-appropriate care

Adapted from Garite TJ et al. Contemp Obstet Gynecol. 1996;41:77-93
fFN — Contraindications and Limitations

- Invalid <24 weeks and >34 weeks
- Sterile speculum exam (SSE) collection is the only FDA-approved collection method
- Vaginal bleeding
- Prior intercourse and/or sterile vaginal exam (SVE) in the last 24 hours
- Cervix $\geq$ 3 cm dilated
- Bulging fetal membranes/PPROM
- Open cervical and/or vaginal lesions
Summary

• The scale and impact of preterm birth are significant
• Timely assessment of women with preterm labor symptoms can improve neonatal and long-term child health outcomes by targeting risk-appropriate interventions in those at risk for preterm labor
• The March of Dimes Preterm Labor Assessment Toolkit improves quality of care through evidence-based, standardized pathways that:
  - Standardize assessment to help diagnose women in preterm labor using clinical criteria and
  - Standardize assessment of risk factors associated with preterm birth for those women who do not meet clinical criteria for preterm labor
Preterm Labor Assessment Toolkit
Algorithm for Preterm Labor (PTL) Triage Assessment

**Triage Assessment**
1. History
2. Physical exam
3. PFM
4. Psychological assessment
5. Medical screening exam

**PTL Assessment**
1. Risk assessment: signs or symptoms such as contractions, reported ruptured membranes, fever, pain, sexual intercourse, dehiscence, vaginal bleeding or heavy vaginal discharge
2. Maternal heart rate measurement
3. Contraction frequency
4. Obtain UA/CTG if indicated per lab protocol

**Report**
1. Notify MD/CHM: Patient data/history include major risks for preterm delivery
2. Notify Fetal Assessment
3. Obtain additional orders

**Perform Pelvic Exam and Action Plan**
- Collect PM sample by sterile speculum exam (D&C), 12-24 weeks, and hold
  - If non-surgical, use proper protocol per published protocols
  - Ferring/Cimelar/Clonidine (if indicated by history)
  - OB culture, BV screen, other tests as needed
  - Perform sterile vaginal exam (SHE)

**Are membranes ruptured?**
- YES
- NO

**Canal dilation of 2 cm or less?**
- YES
- NO

**Recommended PTL Screening Test**
- Send PM to lab, if not contraindicated, using sample obtained prior to pelvic exam O/B
- Assess cervical length via transvaginal ultrasound (TVS), 20-24 weeks, O/B
- If PM and/or TVS are not utilized, or patient is 24 O/G to 36 weeks, repeat SHE for cervical dilation, using 2-hour intervals

**PTL Screening Test Result**
- Positive TVS <20 mm increased risk
- Negative TVS ≥20 mm decreased risk

**Equivalent TVS ≥21 mm**
- Notify MD/CHM
- Consider antenatal corticosteroids (24-34 weeks)
- Advise patient specific plan, ordered by provider
- Consider increased frequency of assessment

**Discharge**
1. Notify MD/CHM
2. Discharge teaching with home care instructions and awareness of contributing factors
3. Follow-up with MD/CHM within 1 week
4. Chart patient disposition in log book

**Treatment and Disposition Options**
Based on findings from the general assessment, PTL assessment and PTL screening test:
1. Notify MD/CHM
2. Intervention pathways
3. Antenatal corticosteroids per provider (24 to 34 weeks)
4. Possible short-term tocolytic treatment
5. Inpatient admission/transport for transport

This decision model represents a guideline for completion of assessment within 2 to 4 hours and should be directed by the provider.

From the March of Dimes Preterm Labor/Induced Tocolytic Toolkit available at; prematurityprevention.org

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Step 1: Assessment/Supportive Care

1. Place the patient in the triage or labor room for evaluation, which should be completed in 2 to 4 hours

2. Reassure the patient and her family with careful explanation of all procedures

3. The registered nurse will review the prenatal record and inquire about previous preterm deliveries

4. Obtain objective data:
   - External monitor for contractions and fetal heart pattern
   - Routine labs
   - SSE: assess for ruptured membranes, obtain fFN (if ordered)
   - SVE: assess cervical status
   - Preterm labor screen: TVU and/or fFN test

5. Inform OB provider
Step 2: Disposition
Option A — Preterm Labor is Identified

If regular uterine contractions are accompanied by*:

a) Initial SVE with cervical dilation of at least 2 cm  \textit{AND/OR}
b) Short cervix ≤20 mm long by TVU between 20 and 28 weeks  \textit{OR}
c) Repeat SVE notes change in cervix (dilation and/or effacement)

Then:
1. Notify provider
2. Administer antenatal corticosteroids if between 24 and 34 weeks gestation
3. Initiate short-term tocolytic therapy, if ordered by provider
4. Admit as inpatient/prepare for transport
5. Activate intervention pathways (e.g., cerclage, vaginal progesterone), if appropriate

*Assumes intact membranes.
Step 2: Disposition
Option B — Preterm Birth Risk Factors

If regular uterine contractions are accompanied by*:

a) Cervix 21-24 mm long by TVU between 20 and 28 weeks gestation

AND/OR

b) Positive fFN between 22 and 34 weeks gestation

Then:
1. Notify provider
2. Consider antenatal corticosteroids (if between 24 and 34 weeks gestation)
3. Consider situational and patient-specific interventions as ordered by provider
4. Discharge disposition after adequate assessment for cervical change:
   Consider increased frequency of assessment

*Assumes intact membranes.
Step 2: Disposition
Option C — Low Risk of Preterm Labor

If regular uterine contractions and results of ALL factors assessed are negative* (cervical dilation of less than 2 cm by SVE, no cervical change at two hours, cervix ≥25 mm long by TVU, negative fFN):

Then:
1. Notify provider
2. Teach patient home care instructions; make aware of risk factors, if any
3. Make follow-up medical appointment in one week
4. Discharge, if ordered by provider

*Assumes intact membranes.
Step 2: Disposition
Option D — fFN & TVU Unavailable

If cervical dilation is less than 2 cm by SVE only (neither fFN nor TVU available):

Recommend serial SVE to assess for cervical change:

1. **Wait 2 hours and repeat SVE.** Serial SVE may be performed more than once at 2-hour intervals if the symptomatic patient is clinically stable and has major risks for preterm delivery — e.g. prior preterm delivery before 34 weeks or current Estimated Gestational Age (EGA) ≤32 weeks

2. **If cervical change, then:**
   A. Notify provider
   B. Administer antenatal corticosteroids, if between 24 and 34 weeks gestation
   C. Initiate short-term tocolytic therapy, if ordered by provider
   D. Consider admission as inpatient/preparation for transport

3. **If no cervical change, then:**
   A. Notify provider
   B. Teach patient home care instructions; make aware of risk factors, if any
   C. Make follow-up medical appointment in one week
   D. Discharge if ordered by provider
Preterm Labor Assessment at 20 to 23 6/7 Weeks

Challenges:

• Both SVE and SSE assess several important factors but fail to detect early cervix changes such as dilation of the internal os, thus hampering timely interventions.

• fFN testing is ineffective at this gestational age, thus not FDA approved.

• Consider TVU for cervical length:
  - If ≤15 mm, rescue cerclage and/or start daily progesterone (90mg gel or 200 mg micronized capsule, both by vaginal administration).
  - If ≤25 mm, consider offering cerclage and/or starting daily progesterone (90mg gel or 200 mg micronized capsule, both by vaginal administration).
  - Consider ACS for ≥23 weeks gestation.

Preterm Labor Assessment at 34 to 36 6/7 Weeks

- Prodromal labor is a common challenge that can be frustrating to patients due to ongoing symptoms and uncertain timing of delivery
- There is no data to support intervention for prodromal labor
- Unless there is a clear indication, augmentation of labor is considered an elective intervention. Elective delivery prior to 39 weeks is associated with increased maternal and neonatal morbidities

Recommendations:
1. Use traditional assessment by serial cervical exams at least 2 hours apart
2. Avoid unnecessary interventions. Allow normal progression of latency period to avoid late preterm morbidities such as RDS, hypoglycemia, and jaundice
3. Educate the patient and her family members to manage expectations and allow informed decision-making
Preterm Labor Assessment Order Set

Order Set is available to download at: prematurityprevention.org
Home Care Instructions

Home Care Instructions for Women at Risk for Preterm Labor

Your health care provider has determined that you are at risk for premature birth. To help prevent this, you need to call your health care provider immediately:

- Your baby stops moving.
- Your bag of water breaks.
- You have more than 3 contractions in 1 hour.
- You have any bleeding from your vagina.
- You have a lot of blood back. The pain may be felt in your lower back, in your sides or front.
- You have a fever higher than 100.4°F.

The hospital number to call is.

Warning signs of preterm labor

If you have any of these signs and symptoms or are unsure, call your health care provider.

Activity

- Many women have more contractions when they are active. This is normal, and there is no proof that reducing your activity, including sexual intercourse, will reduce your risk for preterm birth. However, your health care provider may choose to limit your activity and recommend the following activity level for your pregnancy.

- Light activities:
  - Most of the time, you should be on your side. You may be up during the day for short periods of time (less than 30 minutes). Non-heavy work or lifting is permitted. Someone else may need to do the heavy lifting.
  - You may speak during the day, but you must be down at least once in the morning and once in the afternoon for about 1 hour. No bending, heavy work, gardening, or lifting is permitted. You may need to be off work outside the home.
  - You may resume your normal activities.

For more information, go to marchofdimes.com.

Home Care Instructions (continued)

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Patient Education Materials

Signs of Preterm Labor
What you need to know
Even if you do everything right, you can still have preterm labor. Preterm labor means that your baby is starting to be born too early, before 37 completed weeks of pregnancy.

Babies born too early may have more health problems or need to stay in the hospital longer. Learning the signs of preterm labor may help keep your baby from being born too early.

What you can do
- Call your health care provider or go to the hospital right away if you think you are having preterm labor.
- Try not to worry too much. Getting help quickly is the best thing you can do.
Additional Implementation Resources

March of Dimes Nursing Modules • marchofdimes.com/nursing
- Intrapartum Nursing Management of Preterm Labor (online CE module)

Competencies:
- Sterile Speculum Exam Training
  American College of Nurse-Midwives
  midwife.org/Intrapartum-Sterile-Speculum-Examination
- Transvaginal Ultrasound Assessment of the Cervix and Prediction of Spontaneous Preterm Birth
  uptodate.com (Search Transvaginal Ultrasound Assessment. Full article available to subscribers only.)
Summary

• Preterm birth remains a serious problem
• Women at risk need to be identified early for evaluation and intervention
• PLAT provides an effective means to improve care of women who present with symptoms of preterm labor
• PLAT is designed to allow proper assessment and clinical disposition in 2 to 4 hours:
  A. Prompt confirmation of preterm labor by diagnostic criteria allows timely intervention
  B. For women who do not meet preterm labor diagnostic criteria, PLAT utilizes risk assessment screening including TVU and fFN as predictors of preterm birth:
    - Positive test(s) can help target interventions in women most likely to benefit
    - Negative test(s) can help in avoiding unnecessary interventions and provide reassurance
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2013 PLAT Authors

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- James Byrne, MD
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- Victoria Lombardo, MSN, RN
- Peyton Mason-Marti, MPH
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External Reviewers

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Richard L. Berkowitz, MD
Scott Berns, MD, MPH, FAAP
Brenda Chagolla, RNC, MSN, CNS
Conrad R. Chao, MD
Jeanne A. Conry, MD, PhD
John S. Curran, MD
Dana Edelman, MPH, CHES
Alan R. Fleischman, MD
Armando Fuentes, MD
Ronald S. Gibbs, MD
William Gilbert, MD
J. Christopher Glantz, MD, MPH
Phillip A. D. Higgins, MD, MBA, FACOG
Washington C. Hill, MD, FACOG
Iffath Abbasi Hoskins, MD

Marilyn A. Kacica, MD, MPH
David C. Lagrew, Jr., MD
Elliott Main, MD
Edward McCabe, MD, PhD
Bryan Oshiro, MD
Gretchen Page, MPH, CNM
Mary-Jane Roebuck
Wendy Shaw, MS, BSN
Leona Shields, PHN, MN, NP
Joe Leigh Simpson, MD
Julie Solomon, PhD
Eugene P. Toy, MD
Connie von Köhler, RNC, MSN
John S. Wachtel, MD, FACOG
Janice E. Whitty, MD
For Further Information

Herman Hedriana, MD
hhedriana@sacmfm.com
Sacramento Maternal-Fetal Medicine Medical Group

James Byrne, MD
James.Byrne@hhs.sccgov.org
Santa Clara Valley Medical Center

Janet Meyers, RN, MBA
Janet.Meyers@HCAHealthcare.com
Hospital Corporation of America

Leslie Kowalewski
LKowalewski@marchofdimes.com
March of Dimes
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PART II
Implementing PLAT for Quality Improvement

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Rapid Cycle Change

Step 1: Mobilize QI Team
Step 2: Assess
Step 3: Plan
Step 4: Implement
Step 5: Track Progress

MAP-IT Cycle

Mobilize QI team

• Identify hospital champions (administrators, MDs, CNMs, RNs)

Assess

• Explore PLAT implementation as a QI initiative
• Complete internal baseline survey and chart audit
• Research current preterm labor policies and procedures
• Assess existing process and agreement for maternal transport
• Identify clinical staff training needs and barriers to implementation
• Determine availability of in-house, rapid fFN and/or TVU and SSE capabilities 24/7
• Review patient education materials and home care instructions
Patient Education Materials

Preterm Labor

If your pregnancy is healthy, it’s best to stay pregnant for at least 39 weeks.

A baby’s brain at 35 weeks weighs only two-thirds of what it will weigh at 39 to 40 weeks.

35 weeks         39 to 40 weeks

Signs of Preterm Labor

What you need to know
Even if you do everything right, you can still have preterm labor. Preterm labor means that your baby is starting to be born too early, before 37 completed weeks of pregnancy.

Babies born too early may have more health problems or need to stay in the hospital longer. Learning the signs of preterm labor may help keep your baby from being born too early.

What you can do
* Call your health care provider or go to the hospital right away if you think you are having preterm labor.
* Try not to worry too much. Getting help quickly is the best thing you can do.
Home Care Instructions

Call your health care provider or the hospital immediately if:
- Your baby stops moving.
- Your bag of water breaks.
- You have more than three contractions in 1 hour.
- You have any bleeding from your vagina.
- You have pain, dull backache. The pain may feel in your lower back, toward to your sides or front.
- You have a fever higher than 100.2 F.

The hospital contact to call is:

Activity

- Many women have more contractions when they are active. This is normal, and there is no proof that restricting your activity, including sexual intercourse, will reduce your risk for preterm birth. However, your health care provider may choose to limit your activity and recommends the following activity level for you:
- **Limited activities**: Most of the time you should be down on your side. You may be up during the day for short periods of time (less than 30 minutes). No heavy work or lifting is permitted. Someone else needs to do the heavy work and lifting.
- **Extended activities**: You may be up during the day but you must be down at least once in the morning and once in the afternoon for about 30 minutes. No heavy lifting or carrying is permitted. You may need to get up to work outside the home.
- **No activity restrictions**: You may return your normal activities.

For all activity levels, if you begin to have contractions, you should check if you are having an irregular pattern at your contact numbers. Drink 2 to 3 glasses of water or juice, monitor your contractions and call your health care provider or the hospital.

Turn over to learn the warning signs of preterm labor.

Warning signs of preterm labor

- **Baby movements and contractions**: Go on your side for 1 hour. Place your hands near your belly button. Count the times your baby moves or kicks. If the baby does not move at least 10 times within 1 hour, call your health care provider or your hospital immediately.
- **Sexual activity**: Do not have any sex until your health care provider says it is okay. Having sex again may prevent preterm labor.
- **Drug use**: You need to avoid smoking, drug use, and alcohol.
- **Fluids**: Women get dehydrated sometimes have more intense contractions. Drink 8 to 10 glasses of fluid a day. Less than 1 ounce per hour may cause contractions.
- **Stool softeners**: Constipation (hard stools) is a common problem. The stool softener is to prevent constipation. If you get constipated, drink lots of water and eat foods with fiber. You also set your colostomy bag. Call your health care provider for help with constipation.

For more information go to marchofdimes.com

Home Care Instructions in English and Spanish are available to download at: prematurityprevention.org

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MAP-IT Cycle

Plan

• Revise/develop preterm labor protocol, order sets, patient education and home care instructions; secure approval
• Purchase laboratory and radiology equipment, if needed
• Develop data collection and evaluation strategies
• Establish target start date for rollout of the new preterm labor assessment protocol
• Confirm maternal transport agreements
MAP-IT Cycle

Implement
• Convene department meetings to build buy-in
• Conduct clinical staff trainings
• Hold kickoff event on rollout start date

Track progress
• Collect and analyze data to track adherence to patient assessment pathway
Measuring Progress in Standardizing Preterm Labor Assessment

• Number of patients who presented with suspected preterm labor
• Number of patients assessed using PLAT algorithm
• Length of patient stay in clinic or on service
• Percentage of patients who received fFN test or TVU
• Percentage of patients who received ACS
Measuring Progress: Diagnostic Procedure Codes

ICD-9 (ICD-10)/CPT/HPCPS codes are available for:

• Presentation for preterm labor
• fFN
• TVU
• ACS administration
Measuring Progress: Admission and Discharge/Transfer Data

Data on the following scenarios will help evaluate impact on safety, patient outcomes and cost reduction:

• Patients triaged in L&D, determined not to be in preterm labor, sent home undelivered, and later delivered at term

• Patients triaged in L&D, determined not to be in preterm labor, sent home, and later delivered preterm

• Patients triaged in L&D, determined to be in preterm labor, and admitted but later sent home undelivered; delivered on a subsequent admission

• Patients triaged in L&D, determined to be in preterm labor, admitted, and delivered preterm on this admission
Measuring Progress:
Chart Audit Tool

<table>
<thead>
<tr>
<th>Preterm Labor Assessment Chart Audit Tool</th>
<th>Charts below represent:</th>
<th>Pre-FLAT Implementation</th>
<th>Post-FLAT Implementation</th>
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<td>Patient ID number</td>
<td>Date presenting in hospital with preterm labor symptoms</td>
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Best Practices for Implementation

- Identify passionate RN, CNM and MD champions
- Collect baseline data to support the need for new or revised policies and procedures. This is a significant driver of moving the change process forward.
- Initiate the change process as a QI project
- Use the implementation checklist contained in PLAT to track implementation steps
- Change takes time and repetition. Therefore, communicate regularly with and educate staff and physicians throughout planning and implementation.
Additional Implementation Resources

March of Dimes Nursing Modules • marchofdimes.com/nursing

- *Intrapartum Nursing Management of Preterm Labor* (online CE module)

Competencies:

- **Sterile Speculum Exam Training**
  American College of Nurse-Midwives
  midwife.org/Intrapartum-Sterile-Speculum-Examination

- **Transvaginal Ultrasound Assessment of the Cervix and Prediction of Spontaneous Preterm Birth**
  uptodate.com (Search Transvaginal Ultrasound Assessment. Full article available to subscribers only.)
Case Studies

• Sutter Medical Center, Sacramento

• March of Dimes California Chapter
The Sutter Medical Center, Sacramento Experience

Artist’s rendering of the Sutter Medical Center, Sacramento, Anderson Lucchetti Women’s and Children’s Center, which is scheduled to open in late 2013. Image provided by Sutter Medical Center, Sacramento.
Sutter Medical Center: 1999 to 2002

Issue:

• Triage congestion
• Variation in individual physician triage practices
• Variation in utilization of fFN, SVE and TVU
• Screening tools have weak positive predictive value (PPV) but strong negative predictive value (NPV)

Intervention:

• Developed preterm labor assessment protocol
• Conducted department-wide education
• Embraced standardization hospital-wide
• Purchased rapid fFN equipment and developed testing process and lab competencies
SMCS: Post-implementation Results

Average evaluation time (admit to disposition)
- **Pre:** 6.0 ± 0.7 hours
- **Post:** 1.6 ± 0.24 hours
  - \( P < 0.001 \)

Average length of stay (ICD9-CM 644.03)
- **Pre:** 3.4 ± 0.21 days
- **Post:** 1.34 ± 0.07 days
  - \( P < 0.001 \)
SMCS: Three Years Post-Implementation

- Evolved into a quality improvement project
- Mean decision time in labor and delivery triage was 2 hours
- Reduction in antenatal admissions for uterine contractions without cervical change
- Decreased use of 23-hour observation
- Increased patient satisfaction
  - Hedriana et al. AJOG 2005;193(6):S52
- Cost reduction of $38,000 per month, calculated by independent external analyst
Evaluation question: Could PLAT implementation improve patient assessment, resulting in appropriate disposition decisions?

Data Source: Medical chart audit at 15 hospitals. Pre-implementation audit and post-implementation audit after 3 months.

Profile of 15 hospitals:
- Range from 300 to 3,500 births/year
- 5 rural, 8 urban, 2 university
- Levels of care:
  - 6 Level I
  - 2 Level II
  - 5 Level III
  - 2 Level IV
Decision Points that Define PLAT Adherence

1. Sterile speculum examination
2. Assessment of cervical status
3. Assessment of cervical change
4. No tocolysis use prior to completion of assessment
5. No antenatal corticosteroid use prior to completion of assessment
6. Appropriate disposition decision
7. Time to disposition
8. Provision and review of educational materials
Compliance with PLAT Decision Points Pre- and Post-Implementation

* Change from pre- to post-implementation is statistically significant, p<0.05
‡ % compliance with PLAT = Avg # of decision points followed/Total # of applicable decision points
Disposition Decision Based on Completed Cervical Change Assessment

<table>
<thead>
<tr>
<th>Disposition</th>
<th>N</th>
<th>Excluded</th>
<th>Pre (%)</th>
<th>Post (%)</th>
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<tbody>
<tr>
<td>Admits/Transfers</td>
<td>87</td>
<td>13$^a$</td>
<td>4.2</td>
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<td>10$^a$</td>
<td>26.1</td>
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$^*$ Change from pre to post is statistically significant with p<0.05

$^a$ Cervical change assessment not reported or N/A

$^\dagger$ Medical record met criteria for inclusion but disposition not reported

Change in the positive direction is the desired outcome.
Total Decision Points Complying with PLAT

Change from pre to post is statistically significant for 1-2 decision points and for 7-8 decision points, p<0.05
PLAT Evaluation Conclusions

• PLAT implementation increased appropriate patient assessment by clinicians, and standardization of practice increased.

•Disposition decisions based on completed cervical change assessment also increased.

•Full compliance with the new protocol and procedures requires longer than 3 months.

•Factors that impact compliance:
  - Clinicians are reluctant to perform SSE for all patients.
  - Incomplete cervical change assessment affects disposition.
  - In a large minority of cases, physicians begin treatment for preterm labor prior to completion of assessment.
Anecdotal Findings

• Implementation of standardized assessment can reduce the risk of mismanaged delivery

• In many cases, PLAT will improve patient satisfaction because patients feel they are receiving superior care

• Expectations may be reduced that low-threshold signs and symptoms — e.g., contractions — will lead to delivery. By establishing a “Maybe Baby” room for labor assessment, patients more readily accepted being sent home undelivered.
For Further Information

Herman Hedriana, MD
hhedriana@sacmfm.com
Sacramento Maternal-Fetal Medicine Medical Group

James Byrne, MD
James.Byrne@hhs.sccgov.org
Santa Clara Valley Medical Center

Janet Meyers, RN, MBA
Janet.Meyers@HCAHealthcare.com
Hospital Corporation of America

Leslie Kowalewski
LKowalewski@marchofdimes.com
March of Dimes
Thank You

Working together for stronger, healthier babies

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