Intrapartum Nursing Management of Preterm Labor

Audrey Lyndon, PhD, RNC, CNS-BC, FAAN

5.0 contact hours

Note: To use the links in this module it must be in Slide Show view. See slide 4 for instructions.

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Author bio and disclosure

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Audrey Lyndon is an assistant professor in the University of California, San Francisco (USCF) School of Nursing. She is a clinical research scholar in the UCSF Clinical and Translational Sciences Institute, a volunteer clinical nurse specialist in the UCSF Benioff Children’s Hospital, and a volunteer leader with the AWHONN-California Section and the California Maternal Quality Care Collaborative. Dr. Lyndon has practiced as a staff nurse, a clinical nurse specialist and as faculty in community and academic labor and delivery units in the Washington DC-Baltimore region and in San Francisco.

Disclosure: Audrey Lyndon has no financial, professional or personal relationship that could potentially bias the content of this module.
Module purpose

This module is designed for registered nurses who provide triage, stabilization and intrapartum care for women at risk for preterm birth due to preterm labor or preterm premature rupture of membranes. The module reviews evidence-based practices for optimizing the health of infants born prematurely, and for supporting the health of women and families facing threatened preterm birth. Controversies and emerging evidence regarding management of threatened preterm birth are discussed, as are guidelines for nursing and medical interventions and interdisciplinary management.
Module objectives

After studying this module, nurses will be able to:
1. Discuss two advances in the prevention of preterm birth
2. Identify three critical nursing triage assessments to perform with women presenting with symptoms of preterm labor or preterm premature rupture of membranes
3. Explain the goals of intrapartum management of PTL and PPROM and discuss the interventions used in their management
4. Identify patient safety risks associated with management of preterm labor
5. Describe three nursing interventions to support the psychosocial well-being of women who are hospitalized during the antepartum period

Introduction

The costs to health of preterm birth include:
- Increased risk of death in the first year of life
- Potentially devastating long-term disability
- Significant emotional burdens for families
- Significant financial and policy demands for families and society related to health care and educational needs

Few interventions can definitively prevent preterm birth, but several perinatal interventions can improve outcomes for premature newborns (Society for Maternal-Fetal Medicine [SMFM], 2010).

“The well-being of mothers, infants and children determines the health of the next generation and can help predict future public health challenges for families, communities and the medical care system. Moreover, healthy birth outcomes and early identification and treatment of health conditions among infants can prevent death or disability and enable children to reach their full potential.”

— U.S. Department of Health and Human Services [USDHHS], 2012 (para. 1)
## Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>17P</td>
<td>17 α-hydroxyprogesterone</td>
</tr>
<tr>
<td>Late preterm birth (LPTB)</td>
<td>Birth that occurs between 34-0/7 weeks and 36-6/7 weeks of gestation</td>
</tr>
<tr>
<td>Latency</td>
<td>The period between preterm premature rupture of membranes and the onset of labor</td>
</tr>
<tr>
<td>Low-birthweight (LBW)</td>
<td>Birthweight &lt;2,500 grams (5 pounds, 8 ounces)</td>
</tr>
<tr>
<td>Premature rupture of membranes (PROM)</td>
<td>Rupture of membranes before the onset of labor</td>
</tr>
<tr>
<td>Preterm birth (PTB)</td>
<td>Birth that occurs between 20-0/7 and 36-6/7 weeks of gestation, regardless of birthweight</td>
</tr>
<tr>
<td>Preterm labor (PTL)</td>
<td>Labor that begins before 37 completed weeks gestation. Labor means regular contractions associated with cervical change, not just preterm contractions.</td>
</tr>
<tr>
<td>Preterm premature rupture of membranes (PPROM)</td>
<td>Rupture of membranes before the onset of labor and prior to 37 weeks gestation; birth typically occurs within 1 week.</td>
</tr>
<tr>
<td>Short cervix</td>
<td>Cervical length is 10 mm to 20 mm</td>
</tr>
<tr>
<td>Transvaginal ultrasound (TVU)</td>
<td>A type of pelvic ultrasound used to look at a woman’s reproductive organs</td>
</tr>
<tr>
<td>Very low birthweight (VLBW)</td>
<td>Birthweight &lt;1,500 grams (3 pounds, 4 ounces)</td>
</tr>
<tr>
<td>Very short cervix</td>
<td>Cervical length is &lt;15 mm</td>
</tr>
</tbody>
</table>
Significance of preterm birth

In the United States, the PTB rate is a leading MCH indicator because prematurity can lead to lifelong chronic illness, neurodevelopmental disability and neonatal death (Hamilton, Martin, & Ventura, 2011).

U.S. National Vital Statistics reports (Martin et al, 2012) indicate:

- The PTB rate increased from 9.44 percent in 1981 to 12.8 percent in 2006 and declined to 11.99 percent in 2010.
- The 2010 PTB rate remains higher than in any year between 1981 and 2001.

Significance of preterm birth

- Improvements in the PTB rate since 2006 appear to be driven by reductions in late preterm births (LPTB). The LPTB rate increased rapidly between 1990 and 2006, peaking at 9.15 percent of live births. It has steadily declined since then to 8.49 percent of live births in 2010.
- LBW occurs in about 8 percent of births; VLBW occurs in about 1.5 percent.
- Significant racial disparities persist in MCH indicators:
  - In 2010, the PTB rate among non-Hispanic black women was 17.12 percent, versus 10.77 percent for non-Hispanic white women and 11.79 percent for Hispanic women.
Significance of preterm birth

- In 2010, the PTB rate for non-Hispanic black women is the lowest reported in 3 decades and the 2010 PTB rate for Hispanic women is the lowest since reporting began in 1989. However, since 2006 the overall reductions in PTB in non-Hispanic births is twice that of Hispanic births.

Risk factors for preterm birth

- Most preterm births occur in women without risk factors.
- The most reliable risk factors are:
  - Previous PTB and short cervix: women with a previous PTB are 2- to 3-times more likely to have a subsequent PTB.
  - Multiple gestation
- PTB occurs via multiple pathways and complex interactions between fetal, maternal and environmental conditions.

“Researchers have found some risk factors for preterm birth, but they still can’t predict which women will give birth too early.” — March of Dimes, 2011
Intrapartum Nursing Management of Preterm Labor

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Introduction

Risk factors

Factors contributing to PTB

- Physical or psychological stress
- Mechanical stress (uterine distention or stretching, short cervix, previous uterine surgery)
- Uterine bleeding (decidual hemorrhage)
- Infection or inflammation
- Medical complications of pregnancy (Kramer et al., 2011; Lyndon, 2006; SMFM, 2010)
  - Intrauterine infection is suspected to account for 25 to 40 percent of PTBs.
  - Medical complications, such as preeclampsia, may result in indicated PTB when the risks to mother of continuing pregnancy outweigh the benefits to the fetus of continuing gestation.

Objective 1:

Discuss two advances in the prevention of preterm birth
Preventability: Progesterone therapy

Progesterone Therapy (Society for Maternal Fetal Medicine, 2012):

- Progesterone therapy is the only medication that has shown efficacy in preventing preterm birth. While progesterone’s calming effect on uterine activity has been known since the 1950’s, the efficacy of progesterone for PTB prevention has only been demonstrated over the last decade.

- Mechanisms of action: Progesterone is thought to work by one of two mechanisms, either by supplementing decreased progesterone levels in the tissues that precede PTB, or through an anti-inflammatory effect. However, the exact mechanisms for the effects of progesterone are not well understood.

- The effects of progesterone can vary with delivery method (intramuscular or vaginal suppository) and responses to progesterone can also vary with specific sub-populations of women at risk for PTB, so therapeutic recommendations vary according to specific risk characteristics (see next slide for dosing recommendations.)

- Studies following exposed fetuses from birth up to four years of age have not shown any adverse effects to date when compared to placebo.

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**SMFM (2012) guidelines for progesterone therapy for women with singleton pregnancies**

<table>
<thead>
<tr>
<th>No history of prior PTB</th>
<th>History of PTB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider single transvaginal ultrasound (TVU) screening for cervical length (CL) at 18 to 24 weeks $^{a,b}$</td>
<td>17P 250 mg intramuscularly every week starting at 10 to 20 weeks until 36 weeks</td>
</tr>
<tr>
<td>If TVU screening done</td>
<td>Serial TVU from 16 to 23-6/7 weeks</td>
</tr>
<tr>
<td>CL $\leq$ 20 mm</td>
<td>CL $&gt;20$ mm</td>
</tr>
<tr>
<td>Vaginal progesterone 200 mg suppository or 90 mg gel daily to 36 weeks</td>
<td>Routine care</td>
</tr>
<tr>
<td>Continue 17P and place cerclage</td>
<td>Continue 17P</td>
</tr>
</tbody>
</table>

$^a$ There is no evidence of effectiveness of progesterone for preventing PTB in multifetal pregnancies, women with normal or unknown CL or women symptomatic for PTL or PROM.

$^b$ Routine screening for cervical length is controversial. SMFM recommends following strict guidelines for routine screening to avoid misuse of screening and overuse of therapy.
Preventability: Modifiable risk factors

- Modifiable risk factors for PTB include:
  - Smoking
  - Short inter-pregnancy intervals
  - Low prepregnancy weight or poor nutrition
  - Substance abuse
- Preconception and interconception care are opportune times to engage women in reducing these risks (Albrecht, 2004; Lumley et al., 2009; Moos et al., 2011).
- Many chronic conditions, such as chronic hypertension, systemic lupus erythematosus (SLE), asthma and chronic renal disease increase a woman’s risk for PTB (Dunlop et al., 2008).
  - For some chronic conditions such as SLE, which have a 25 percent risk of PTB, good control of the condition prior to pregnancy substantially decreases the risk of PTB (Dunlop et al., 2008).
  - Quality preconception and prenatal care provide access to interventions to decrease the risks associated with chronic conditions and optimize maternal health (Berghella et al., 2011).

Preventability: Summary

Despite tremendous advances in preventing PTB with antenatal progesterone therapy and careful management of chronic conditions, there are presently no known methods for preventing preterm birth once preterm labor has begun or the membranes have ruptured prematurely. Thus, the focus of intrapartum nursing care for women presenting with symptoms of PTL or PPROM are to:

- Evaluate signs and symptoms
- Communicate effectively with the woman and her family and the woman’s primary provider
- Initiate interventions shown to improve neonatal outcomes

Something to think about…
What systems are in place in your clinic, public health service or hospital system to ensure that women who are screened for modifiable risk factors for preterm birth receive appropriate follow-up?
Objective 2:
Identify three critical nursing triage assessments to perform with women presenting with symptoms of preterm labor or preterm premature rupture of membranes.

Triage assessments

<table>
<thead>
<tr>
<th>Triage assessments for PTL and PPROM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial assessment</strong></td>
</tr>
<tr>
<td>- Thorough review of the woman's symptoms, prenatal record and history</td>
</tr>
<tr>
<td>- Physical examination</td>
</tr>
<tr>
<td>- Psychosocial assessment, including interpersonal violence assessment</td>
</tr>
<tr>
<td>- Medical screening examination per hospital Emergency Medical Treatment and Active Labor Act (EMTALA) policies</td>
</tr>
<tr>
<td><strong>PTL assessment</strong></td>
</tr>
<tr>
<td>- Gestational age</td>
</tr>
<tr>
<td>- Fetal heart and uterine activity assessment</td>
</tr>
<tr>
<td>- Vital signs</td>
</tr>
<tr>
<td>- Urine-culture</td>
</tr>
<tr>
<td>- Group B strep (GBS) culture</td>
</tr>
<tr>
<td><strong>fFN assessment</strong></td>
</tr>
<tr>
<td>- fFN test collected by sterile speculum exam (SSE)</td>
</tr>
<tr>
<td><strong>Vaginal exam</strong></td>
</tr>
<tr>
<td>- Sterile vaginal exam (SVE) (Always perform the fFN test before the vaginal exam.)</td>
</tr>
<tr>
<td><strong>Cervical length</strong></td>
</tr>
<tr>
<td>- Transvaginal ultrasound or other cervical length measurement (performed by an appropriately qualified provider).</td>
</tr>
</tbody>
</table>
Fetal fibronectin (March of Dimes, in press)

- Fetal fibronectin (fFN) is a protein that is released into cervical and vaginal secretions when there is disruption of the maternal-fetal interface of membranes and decidua.
- The normal level of fFN in cervical/vaginal secretions is <50 ng/mL between 24 and 34 weeks gestation.
  - The utility of fFN is in identifying symptomatic women who are at low risk for preterm birth.
    - fFN has a high negative predictive value in women between 24 and 34 weeks gestation with a negative fFN. Women in this group have a 0.5- to 5-percent chance of giving birth within 7 to 14 days.

Considerations for testing include:
- Specimen must be collected by sterile speculum exam PRIOR to digital examination.
- fFN is not usable in the presence of vaginal bleeding; intercourse or SVE within 24 hours prior to specimen collection; cervical dilation ≥3 cm; PPROM or bulging membranes; or open cervical/vaginal sores.

Cervical length

- For hospitals and practices that have the capability, TVUs are strongly predictive of the risk for PTB (March of Dimes, in press).
  - Cervical length measurement of >25 mm by TVU indicates a low risk of preterm birth before 32 weeks gestation.
  - Short cervix (≤20 mm by TVU) indicates a high risk for preterm birth; the degree of risk may be related to the rate of cervical shortening (Moroz & Simhan, 2012).
- TVU requires technical skill and has a steep learning curve.
  - TVU can be performed only in the absence of vaginal bleeding.
  - TVU needs to be performed when the woman’s bladder is empty.
  - TVU is valid only between 15 and 28 weeks gestation.
  - For PTL evaluation, TVU is used in women between 20 and 28 weeks.
- Some facilities use measurement of cervical portio (external) length as a first cervical length screening, and only obtain TVU in women with short portio length, or use portio length and fFN together (Burwick et al., 2011; Ross et al., 2009). CerviLenz™ is a medical device approved by the Food and Drug Administration (FDA) for portio length measurement (FDA, 2001).
Using fetal fibronectin and cervical length in triage assessment:

1. Upon assessing presenting symptoms, women presenting with suspicion for PTL or PPROM should first receive a sterile speculum examination.
2. Collect fFN specimen (24 to 34 weeks), testing for rupture of membranes, and GBS culture per protocol. Hold fFN specimen. Perform SVE after collecting fFN specimen.
3. If membranes are not ruptured and the cervical dilation is <2 cm, perform screening tests (send fFN and/or obtain TVU cervical length measurement).
4. Notify provider of findings.

Discharge to home as ordered with self-care instructions if:
- Negative fFN and/or
- TVU ≥25 mm (2.5 cm)
- TVU not available and no cervical change on repeat SVE 2 hours after last exam.

Ensure follow-up with primary OB provider within one week of triage visit, sooner if symptomatic.

Dispose and treatment options after triage assessments (March of Dimes, in press):

<table>
<thead>
<tr>
<th>Test results</th>
<th>Administer antenatal steroids</th>
<th>Admit/Prepare for transport</th>
<th>Discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruptured membranes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>TVU cervical dilation ≥2 cm</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Cervix &lt;2 cm long by TVU at 20 to 28 weeks or change in dilation or effacement of cervix on repeat SVE</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Cervix ≥21 to 24 mm long by TVU at 20 to 28 weeks and/or (+) fFN at 22 to 34 weeks</td>
<td>Consider</td>
<td>Consider</td>
<td>Consider, if no change in SVE over 2 hours</td>
</tr>
<tr>
<td>Cervical dilation &lt;2 cm by SVE and cervix ≥25 mm long by TVU and/or negative fFN</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>TVU is the only means of assessment, initial dilation is ≥2 cm and cervical change detected on repeat SVE after 2 hours</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>TVU is the only means of assessment, initial dilation is ≥2 cm and no cervical change detected on repeat SVE after 2 hours</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

March of Dimes, in press
Objective 3:

Explain the goals of intrapartum management of PTL and PPROM and discuss the interventions used in their management.

Goals of Management: Preterm Labor

Despite the concern that mothers and providers will have for stopping contractions, tocolytics have not been shown to be effective for delaying birth for prolonged periods of time. Thus, the primary goals for management of preterm labor and threatened preterm birth are to quiet uterine activity long enough to provide other interventions with demonstrated neonatal benefit:
  - Ensure birth in a facility with the appropriate level of neonatal care
  - Administer a full course of antenatal corticosteroids
  - Administer GBS prophylaxis
  - Consider treatment for neuroprotection
  - If used, tocolysis is to “buy time” (48 to 72 hours) for these interventions

The goals of nursing management are to
  - Promote maternal and fetal wellbeing
  - Maintain safety for the woman and her family
  - Facilitate the medical management
  - Provide support for the woman and family experiencing a pregnancy crisis
  - Encourage human milk feeding
Goals of Management: PPROM

The goals of management for preterm premature rupture of membranes are similar to those of preterm labor management, but also include (ACOG, 2007, 2011):

- Prolonging the latency period for PPROM
  - Expectant management is recommended as long as there are no maternal or fetal contraindications.
  - Antibiotic therapy has been shown to improve outcomes in the context of PPROM by prolonging the latency period and reducing short-term neonatal morbidity (ACOG, 2011).
  - There is not enough evidence for or against use of tocolytics (Mackeen et al., 2011).
- Avoiding introduction of pathogen
  - Minimize vaginal examinations
- Prompt identification of signs and symptoms of infection
  - The ruptured membranes both create a portal for infection and may be the result of sub-clinical infection.

What about Bedrest?

- Evidence does not support the use of bedrest (antepartum activity restriction), oral or parenteral hydration, or pelvic rest (avoidance of intercourse and orgasm) in the treatment of preterm labor. ACOG (2012) advises that these therapies not be routinely recommended.
  - However, in the United States providers prescribe bedrest for more than 700,000 women annually for antepartum complications (Maloni, 2010).
  - As many as 95 percent of obstetricians use bedrest for pregnancy complications, and 70 percent of maternal-fetal medicine specialists prescribe bedrest for PTL (Bigelow & Stone, 2011).
- Nursing scholarship has been particularly important in highlighting the potentially harmful effects of bedrest for women with antepartum complications. Maloni (2010) pioneered the translation of aerospace research findings to the physiology of antepartum activity restriction and expanded the research to include the psychosocial impact of activity restriction on pregnant women.
Appropriate level of neonatal care

A critical concern in the management of PTL and PPROM is preparing for birth to occur in a facility with the appropriate level of neonatal care. In most cases, neonatal outcomes are optimal when transport to the appropriate level of care occurs before, rather than after, birth.

- In facilities without appropriate personnel and equipment for the gestational age and estimated birthweight, providers should prioritize stabilization and maternal transport to a facility capable of caring for the infant.
- VLBW infants are especially vulnerable and, whenever possible, should be born in a facility that provides subspecialty care (American Academy of Pediatrics [AAP]/ACOG, 2007).
- In facilities with appropriate personnel and equipment for the gestational age and estimated birthweight, early communication with the neonatal team is critical to assess resources, preparation and parental counseling needs.

Something to think about...
What systems are in place in your hospital or clinic to ensure babies are born at facilities that provide the appropriate level of care for gestational age?
Antenatal corticosteroids (ACOG, 2012)

ACOG (2012) considers antenatal corticosteroids (ANS) the most effective and beneficial intervention available for women in true preterm labor.

- ANS improves neonatal outcomes by reducing
  - The incidence of respiratory distress syndrome (RDS), intraventricular hemorrhage (IVH) and necrotizing enterocolitis (NEC) in the neonate
  - The severity of RDS when it occurs

- All women between 24 and 34 weeks of pregnancy who are determined to be at risk for preterm birth within the next 7 days should receive either:
  - Two doses of betamethasone 12 mg intramuscularly, 24 hours apart
  - Four doses of dexamethasone 6 mg intramuscularly, 12 hours apart

Women with PPROM prior to 32 weeks should receive ANS; treatment may be beneficial between 32 and 33 weeks, but this is unclear.

- Optimal benefit occurs after 24 hours and lasts 7 days. ANS are still beneficial when birth occurs prior to 24 hours, and should be administered even when there may not be time to complete the full course (ACOG, 2012).
Why women don’t receive ANS

ACOG’s ANS recommendation was established subsequent to a 1994 National Institutes of Health Consensus Conference. Recommendations have not changed substantially since then. Yet according to Lee and colleagues (2011), 15 to 25 percent of eligible women did not receive ANS prior to preterm birth:

- Risk factors for not receiving ANS included receiving inadequate prenatal care and giving birth at a non-regional center.
- ANS administration dropped rapidly between 30 and 34 weeks gestation.
- Risk-adjusted ANS administration rates varied widely between hospitals, suggesting ample opportunities for improving reliability of ANS administration.


Antibiotics

- Antibiotics are indicated in the management of PTL and PPROM under two conditions (ACOG, 2011):
  1. To prolong latency between rupture of membranes and onset of labor in women with PROM at <37 weeks gestation
  2. For GBS prophylaxis
- Antibiotics are not recommended to prolong pregnancy in women with PTL and intact membranes (ACOG, 2011; 2012).
  - Use of antibiotics solely for prolonging labor in the setting of PTL with intact membranes is associated with long-term harm to the neonate, including cerebral palsy and functional impairment (Kenyon et al., 2008).
  - This recommendation is distinct from recommendations regarding PPROM and GBS prophylaxis.
ACOG (2011) recommends a 7-day regimen of broad spectrum antibiotics for prolonging latency in women with PPROM <37 weeks when delivery is not imminent and lung maturity is not documented. Meta-analyses have demonstrated positive effects on prolonging latency and reducing complications from maternal and neonatal infection.

Antibiotics with adequate GBS coverage given for 48 hours are sufficient for GBS prophylaxis if birth occurs while the patient is receiving these antibiotics (CDC, 2010; ACOG, 2011).

- Antibiotic regimen with adequate GBS coverage is 2 grams of Ampicillin IV followed by 1 gram IV every 6 hours for 48 hours.
- Oral antibiotics alone do not provide coverage for GBS prophylaxis.
- GBS status should not affect the duration of antibiotics administered to prolong latency.

GBS prophylaxis

GBS disease is the leading cause of early-onset neonatal sepsis in the United States, and the leading cause of infectious morbidity and mortality, with case fatality rates as high as 20 to 30 percent in premature newborns (CDC, 2010).

<table>
<thead>
<tr>
<th>GBS transmission and risk factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission</td>
</tr>
<tr>
<td>- Vertically, from mother to newborn, usually through ascending infection from the vagina during labor or after rupture of membranes</td>
</tr>
<tr>
<td>- Through aspiration of amniotic fluid or transference to the fetus through intact membranes</td>
</tr>
<tr>
<td>- Through maternal GBS colonization during the intrapartum period. This is the strongest risk factor for early-onset GBS sepsis.</td>
</tr>
<tr>
<td>Maternal risk factors</td>
</tr>
<tr>
<td>- Previous birth of an infant with GBS sepsis</td>
</tr>
<tr>
<td>- Gestational age &lt;37 weeks</td>
</tr>
<tr>
<td>- Prolonged rupture of membranes</td>
</tr>
<tr>
<td>- Younger maternal age</td>
</tr>
<tr>
<td>- Black race</td>
</tr>
</tbody>
</table>
CDC (2010) has recommended universal culture-based screening for GBS from 35 to 37 weeks gestation since 2002.
- Maternal GBS bacteriuria at any time during pregnancy signifies heavy colonization and is an indication for intrapartum prophylaxis.
- In women presenting with PROM at <37 weeks or preterm labor, GBS culture should be taken and prophylaxis given until results are available.
  - When administered appropriately, prophylaxis is 78 percent effective in this population for prevention of early-onset GBS. Historically, these women have frequently been missed for prophylaxis.
- Women with a history of a previous infant with GBS disease should also receive intrapartum prophylaxis.
- Appropriate specimen collection for GBS culture is a swab of the lower vagina and rectum, through the anal sphincter.
- Antibiotic susceptibility testing should be done on the culture for all women who are penicillin allergic and at high risk for anaphylaxis.

CDC (2010) guidelines for intrapartum GBS prophylaxis

**Intrapartum prophylaxis indicated**
- Previous infant with invasive GBS
- GBS bacteriuria in current pregnancy
- Positive late-gestation (35 to 37 weeks) GBS vaginal-rectal screening culture
- Unknown GBS status at onset of labor and any of the following:
  - <37 weeks gestation
  - ROM >18 hours
  - Intrapartum temperature ≥100.4 F or ≥38.0 C
  - Positive intrapartum nucleic acid amplification test

**Intrapartum prophylaxis not indicated**
- Colonization or GBS bacteriuria in a previous pregnancy and no indication for current pregnancy
- Negative late-gestation screening culture regardless of intrapartum risk factors
- Cesarean birth before onset of labor for a woman with intact membranes, regardless of GBS colonization status or gestational age

*Prophylaxis not indicated if cesarean birth performed before onset of labor in women with intact membranes.
GBS prophylaxis

CDC (2010) guidelines for GBS and preterm labor

Obtain GBS culture via vaginal-rectal swab during initial assessment and initiate GBS prophylaxis while results are pending.

If entering true labor

- Continue GBS prophylaxis until birth. If vaginal-rectal culture results obtained within the last 5 weeks are available, they should guide management.
- If culture results are negative, discontinue GBS prophylaxis.

If not in labor

- Discontinue GBS prophylaxis and obtain culture results.
- If results are positive or unknown at the time labor ensues, GBS prophylaxis is needed at the onset of true labor.
- If culture results are negative, GBS prophylaxis is not needed when labor does ensue; repeat culture between 35 and 37 weeks gestation and give prophylaxis if subsequent culture is positive at the onset of true labor.

CDC (2010) guidelines for GBS and PPROM

Obtain GBS culture via vaginal-rectal swab during initial assessment and initiate antibiotics for latency or GBS prophylaxis.

If entering labor

- Continue antibiotics until birth.

If not in labor

- Continue antibiotics for latency or continue GBS prophylaxis for 48 hours or until negative GBS culture obtained.
- If results are negative, GBS prophylaxis is not needed when labor does ensue; repeat culture between 35 and 37 weeks gestation and give prophylaxis for labor if subsequent culture is positive.
- If results are positive or unknown at the time labor ensues, GBS prophylaxis is needed at the onset of true labor.

* If vaginal-rectal GBS culture results obtained within the last 5 weeks are available, they should guide management.
** Antibiotics for latency that include Ampicillin 2 grams IV followed by 1 gram IV every 6 hours for at least 48 hours provide adequate coverage for GBS prophylaxis. If other antibiotics are used for latency, additional GBS prophylaxis is needed.
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Objective 3: Goals of management. Slide 43

### GBS prophylaxis

<table>
<thead>
<tr>
<th>Women not allergic to penicillin</th>
<th>Women allergic to penicillin</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Penicillin G, 5 million units IV, followed by 2.5 to 3.0 million units IV every 4 hours until birth.</td>
<td></td>
</tr>
<tr>
<td>- An acceptable alternative to penicillin in non-penicillin allergic women is Ampicillin, 2 grams IV, followed by 1 gram IV every 4 hours until birth.</td>
<td></td>
</tr>
<tr>
<td>- Determine if the woman is at high risk for anaphylaxis, which is indicated by a history of any of the following after receiving penicillin or cephalosporins: anaphylaxis, angioedema, respiratory distress, or urticaria.</td>
<td></td>
</tr>
<tr>
<td>- Obtain antibiotic sensitivities for the GBS culture.</td>
<td></td>
</tr>
<tr>
<td>- Sensitive to clindamycin and erythromycin?</td>
<td></td>
</tr>
<tr>
<td>- Yes — Clindamycin, 900 mg IV every 8 hours until birth</td>
<td></td>
</tr>
<tr>
<td>- No — Vancomycin 1 gram IV every 12 hours until birth</td>
<td></td>
</tr>
<tr>
<td>- Not at high risk for anaphylaxis</td>
<td></td>
</tr>
<tr>
<td>- Cefazolin, 2 gram IV followed by 1 gram IV every 8 hours until birth</td>
<td></td>
</tr>
<tr>
<td>- Clindamycin and vancomycin should be reserved for women at high risk for anaphylaxis, while women who have not had these reactions should receive cefazolin.</td>
<td></td>
</tr>
</tbody>
</table>

Neuroprotection

Premature infants are at increased risk for developing cerebral palsy. This risk is inversely related to gestational age and is highest in ELBW infants. ELBW infants have a cerebral palsy rate between 8 and 10 percent (Clark & Hankins, 2003; Huusom et al., 2011).

Several studies have been conducted to determine if magnesium sulfate is effective in providing protection against neurologic injury in premature infants.

- None of the studies demonstrated a change in the primary outcome of death or cerebral palsy at 2 years of age (ACOG, 2010).
- A 2009 Cochrane review (meta-analysis) by Doyle and colleagues concluded that magnesium sulfate is effective for neuroprotection with reduction in cerebral palsy with no increase in major maternal complications. Two other meta-analyses confirmed these results (Conde-Agudelo & Romero, 2009; Constantine & Weiner, 2009).
- Subsequent statistical analysis suggests there may not be enough data to draw conclusions about effectiveness (Huusom et al., 2011).
Many questions remain, including how the therapy works, criteria for determining candidates for therapy and optimal dosing regimen.

- While magnesium sulfate for neuroprotection is not presently a standard of care, many experts recommend this treatment for women at high risk for birth before 32 weeks (ACOG, 2010, 2012; Clark et al., 2011).

- Administration of magnesium sulfate for neuroprotection should follow specific guidelines based on one of the clinical trials. Guidelines should include:
  - Who is eligible for treatment based on gestational age and likelihood of imminent birth
  - The dosing protocol (size of loading dose and duration of maintenance dose, if any)
  - Use of tocolytic therapy
  - Frequency of monitoring

- Nurses should actively participate in developing and refining these guidelines, ensuring that they include appropriate standardization and monitoring parameters to maintain safety and wellbeing (Lyndon, 2006; Simpson, 2005; Simpson & Knox, 2004).

Sample neuroprotection protocol

<table>
<thead>
<tr>
<th>Candidates for therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>23-0/7 weeks to 31-6/7 weeks and</td>
</tr>
<tr>
<td>- PTL, cervical change, high likelihood of birth within 12 h</td>
</tr>
<tr>
<td>- PPROM</td>
</tr>
<tr>
<td>- Planned birth</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Excluded from therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Intrauterine fetal demise</td>
</tr>
<tr>
<td>- Severe preeclampsia. (Follow preeclampsia protocol instead.)</td>
</tr>
<tr>
<td>- Lethal fetal anomaly</td>
</tr>
<tr>
<td>- Maternal contraindications</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Magnesium sulfate 6 gram loading dose IV over 20 to 30 minutes</td>
</tr>
<tr>
<td>- Magnesium sulfate maintenance infusion 2 grams per hour until birth or for 12 hours, whichever occurs first</td>
</tr>
<tr>
<td>- Follow safety and monitoring parameters.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Repeated dosing</th>
</tr>
</thead>
<tbody>
<tr>
<td>If patient returns 6 hours after receiving magnesium for neuroprotection, restart magnesium sulfate at 2 grams per hour without an additional loading dose. If &gt;6 hours has elapsed, begin with loading dose.</td>
</tr>
</tbody>
</table>

Reeves, Gibbs & Clark, 2011
Neuroprotection

Contraindications and relative contraindications of neuroprotective therapy with magnesium sulfate

The benefits of neuroprotective therapy with magnesium sulfate must be weighed against the risks of therapy and continuing questions regarding the mechanism and effectiveness of therapy:

- Intravenous magnesium sulfate is contraindicated in women with myasthenia gravis.
- Intravenous magnesium sulfate should be avoided in women with myocardial impairment or myocardial conduction defects due to effects on cardiac muscle contractility.
- Intravenous magnesium sulfate should be used with caution in women with impaired renal function, as magnesium sulfate is excreted through the kidneys.
  - These women may rapidly develop magnesium toxicity and require very close monitoring.
  - Adjust magnesium infusion maintenance dose for women with serum creatinine >1.0 mg/dL.
- Magnesium sulfate should not be chosen for tocolysis based on neuroprotective effects.

ACOG, 2010

Tocolytic therapy

- Tocolytic medications are used to inhibit uterine activity by a variety of mechanisms. Unfortunately, studies comparing the effectiveness of tocolytics to placebos and to each other have had mixed results and some have shown that tocolytics have only a short-term effect with no direct neonatal benefit (ACOG, 2012).
- A fundamental problem in determining tocolytic efficacy is that placebo-controlled trials are lacking and unlikely to be conducted due to the ethics of withholding tocolysis when antenatal steroids take time to achieve their effect and are known to be beneficial (Conde-Agudelo et al., 2011).
- The only medication that is FDA approved for use as a tocolytic is Ritodrine (which is not available in the United States). The use of all other tocolytics is off-label.
The current focus of tocolytic therapy is to quiet uterine activity for 48 hours in order to administer antenatal corticosteroids and provide an opportunity for transport to a regional center (AAP/ACOG, 2007; ACOG, 2012).

- These two interventions can substantially improve neonatal outcomes.
- Magnesium sulfate may be given for neuroprotection during this time.

There is no clear, first-line choice of tocolytic agent due to the mixed efficacy and potential for serious adverse effects with all agents (ACOG, 2012).

Current evidence does not support the use of any type of tocolytic maintenance therapy (ACOG, 2012; Conde-Agudelo et al., 2011).

- The prolonged use of any tocolytic agent presents safety risks to the mother and potentially the fetus without demonstrated benefit (AAP/ACOG, 2007; ACOG, 2012).

Risks that preclude labor suppression

### Maternal conditions
- Chorioamnionitis. Signs and symptoms include fever, uterine tenderness, maternal and/or fetal tachycardia, elevated white blood cell count, purulent or foul-smelling amniotic fluid.
- Severe preeclampsia or eclampsia
- Maternal hemorrhage
- PPROM, except to facilitate transport or ANS administration in the absence of signs and symptoms of infection

### Fetal conditions
- Severe intrauterine growth restriction
- Abnormal or indeterminate fetal heart rate tracing or other signs of non-reassuring fetal status, such as poor biophysical profile score
- Known lethal fetal anomaly
- Intrauterine fetal demise
Nifedipine is a calcium channel blocker or calcium antagonist that interrupts the calcium channels in the myometrium, resulting in uterine relaxation.

- A systematic review and meta-analysis of 26 research trials compared nifedipine, to betamimetics and magnesium sulfate for tocolysis (Conde-Agudelo, Romero & Kusanovic, 2011). These authors found no difference in efficacy between nifedipine and magnesium sulfate. They comment that more research is needed on the optimal dosing of nifedipine.

- When compared to betamimetics
  - Nifedipine was more effective at reducing the risk of birth within 7 days and before 34 weeks gestation.
  - Nifedipine was associated with improved neonatal outcomes, including reduced risk of serious neonatal morbidities including RDS and NEC.
  - Nifedipine had a more favorable side effect profile than magnesium sulfate or betamimetics with fewer serious maternal adverse events.

### Nifedipine: Contraindications, administration and nursing considerations

**Contraindications**
- Calcium channel blockers are contraindicated in women with cardiac disease and should be used with caution in women with hypotension or renal disease.
- Co-incident use of calcium channel blockers with magnesium sulfate could result in neuromuscular blockade and should be avoided.

**Administration**
- 30 mg load, orally; then 10 to 20 mg orally every 4 to 6 hours

**Nursing considerations**
- Vital signs prior to loading dose
- Vital signs every 15 minutes for 1 hour after loading dose
- Vital signs prior to and 30 minutes after each dose until stabilized; then blood pressure every 4 to 6 hours
- Notify physician for systolic blood pressure <90, diastolic blood pressure <50 or per facility protocol
- Continuous fetal and uterine activity monitoring until stable
### Side effects of Nifedipine

<table>
<thead>
<tr>
<th>Maternal side effects</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transient hypotension</td>
<td></td>
</tr>
<tr>
<td>Flushing</td>
<td></td>
</tr>
<tr>
<td>Headache</td>
<td></td>
</tr>
<tr>
<td>Dizziness</td>
<td></td>
</tr>
<tr>
<td>Nausea</td>
<td></td>
</tr>
<tr>
<td>Fetal side effects</td>
<td>None known</td>
</tr>
</tbody>
</table>

**Tocolytic therapy: Prostaglandin synthetase inhibitors**

Indomethacin is a COX-2 inhibitor that has been used as a tocolytic since the 1970s. Indomethacin interferes with the production of prostaglandins, thereby interfering with uterine contractions. It has evidence of efficacy as a tocolytic and has a beneficial maternal side effect profile.

- A Cochrane review by King and colleagues (2005) concludes that in 13 trials including 713 women, indomethacin is more effective than placebo and other tocolytics in reducing birth before 37 weeks gestation, and more effective than placebo in increasing gestational age and weight at birth. However, these results should be interpreted with caution due to small numbers.
Concerns exist about potential adverse fetal effects, including oligohydramnios, premature closure of the ductus arteriosus (DA) and IVH (Savage, Anderson & Simhan, 2007).

- A systematic review by Loe and colleagues (2005) concluded that there were no differences in neonatal outcomes between exposed and unexposed infants, except for an increase in bronchopulmonary dysplasia in one trial. The authors concluded there was not evidence of increased adverse effects with indomethacin, but the studies lacked sufficient statistical power to exclude the possibility of adverse neonatal effects.

- A review by Berghella and colleagues (2009) concluded that indomethacin is effective and safe for the fetus when used for short-term tocolysis (≤48 hours). In a secondary analysis of an observational study of second-trimester interventions to prevent preterm birth, researchers found that indomethacin has no benefit for women with cervical dilation from 14 to 25 weeks.

### Contraindications

- Indomethacin is contraindicated in women with significant impairment in liver or kidney function (ACOG, 2003).

### Administration

- 50 mg rectal or 50 to 100 mg oral loading dose then
- 25 to 50 mg orally every 6 hours for 48 hours

### Nursing considerations

- Continuous fetal and uterine activity monitoring until stable; then per maternal-fetal condition
- Give medication after meals

### Side effects

- **Maternal side effects:**
  - Nausea
  - Heartburn
  - Potential renal toxicity

- **Fetal side effects:**
  - Constriction of ductus arteriosus
  - Reversible oligohydramnios
  - May be associated with IVH
  - NEC
Tocolytic therapy: Betamimetics

Betamimetic medications stimulate or mimic the beta-adrenergic receptors of the central nervous system. The class of medication includes both terbutaline and ritodrine. Of note, ritodrine is the only FDA approved tocolytic agent, but it is no longer used in the United States.

- In a meta-analysis of 58 studies of tocolytic therapies, Haas and colleagues (2009) estimated that betamimetics were 75-percent effective in delaying birth for 48 hours in 29 trials and 65-percent effective in delaying birth for 7 days in 26 trials. Across clinical trials, betamimetics have the highest rates of adverse effects that required discontinuation of therapy.

- In 2011, the FDA released a drug safety communication regarding the use of terbutaline in pregnancy:

  - Injectable terbutaline should not be used in pregnant women for prevention or prolonged treatment (beyond 48 to 72 hours) of preterm labor in either the hospital or outpatient setting because of the potential for serious maternal heart problems and death. In addition, oral terbutaline should not be used for prevention or any treatment of preterm labor because it has not been shown to be effective and has similar safety concerns.” (FDA, 2011)

  - The FDA identified 16 maternal deaths between 1976 and 1999 and 12 cases of serious maternal cardiovascular events between 1998 and 2009 involving terbutaline. These cases include all forms of administration, including oral, subcutaneous, intravenous and subcutaneous pump. Several cases occurred in women taking oral terbutaline on an outpatient basis.
Tocolytic therapy: Betamimetics

**Terbutaline: Contraindications, administration and nursing considerations**

**Contraindications**
- Terbutaline is contraindicated in women with cardiac arrhythmias and relatively contraindicated in women with cardiac disease and poorly controlled diabetes.
- Terbutaline should be used cautiously in women with significant hemorrhage risk.

**Administration**
- Typical initial dose is 0.25 mg subcutaneously every 20 to 30 minutes up to 4 doses until tocolysis is achieved, then
- 0.25 mg subcutaneously every 3 to 4 hours for up to 48 hours

**Nursing considerations**
- Terbutaline for tocolysis is acceptable for ≤48 to 72 hours.
- Vital signs should be assessed prior to each dose and every 15 min for the first hour after the initial dose. The medication is held for a maternal pulse >120 beats per min.
- The woman should be carefully monitored for signs and symptoms of pulmonary edema, tachycardia, and cardiac arrhythmias.

ACOG, 2012; Briggs et al., 2008

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**Terbutaline: Side effects**

**Maternal**
- Cardiac arrhythmias
- Myocardial ischemia
- Pulmonary edema
- Hypotension
- Tachycardia
- Metabolic alterations

**Fetal**
- Tachycardia
- Myocardial ischemia and hypertrophy
- Hyperglycemia
- Hyperinsulinemia

ACOG, 2012; Briggs et al., 2008
A 2002 Cochrane review of 23 research trials found that magnesium sulfate was no more effective than controls in reducing the risk of birth within 48 hours, before 37 weeks, or before 34 weeks gestation (Crowther et al., 2002). This review determined that magnesium sulfate cannot be recommended as a tocolytic agent for women in preterm labor.

Other systematic reviews and meta-analyses have found magnesium sulfate at least as effective as other tocolytics (Conde-Agudelo et al., 2011; Haas et al., 2009).

The neuroprotective effects of magnesium sulfate may add another complication, as concomitant magnesium sulfate and nifedipine should be undertaken with caution (ACOG, 2012). ACOG (2010) guidelines on neuroprotection state that magnesium should not be chosen for tocolysis based on neuroprotective effects.
**Tocolytic therapy: Magnesium sulfate**

### Side effects of magnesium sulfate as a tocolytic therapy

<table>
<thead>
<tr>
<th>Maternal</th>
<th>Fetal</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Flushing</td>
<td>Possible neonatal depression</td>
</tr>
<tr>
<td>• Headache</td>
<td></td>
</tr>
<tr>
<td>• Nausea</td>
<td></td>
</tr>
<tr>
<td>• Weakness</td>
<td></td>
</tr>
<tr>
<td>• Lethargy</td>
<td></td>
</tr>
<tr>
<td>• Blurred vision</td>
<td></td>
</tr>
<tr>
<td>• Pulmonary edema</td>
<td></td>
</tr>
<tr>
<td>• Central nervous system depression</td>
<td></td>
</tr>
<tr>
<td>• Cardiopulmonary arrest</td>
<td></td>
</tr>
</tbody>
</table>

**ACOG, 2012**

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**Magnesium sulfate: Safe practices**

Magnesium sulfate is a high-alert medication. These medications may not have more frequent errors than other medications, but the consequences of errors can result in catastrophic harm to patients (Institute for Safe Medication Practices (ISMP), 2011).

Safe practices for the administration of magnesium sulfate include (ISMP, 2006; Simpson, 2006; Simpson & Knox, 2004):

- A standardized interdisciplinary protocol for doses and administration
- Pharmacy-supplied, premixed magnesium sulfate solutions, including dose-restricted IV solution containers with clear, legible labels:
  - 100 mL bag for 4 gram loading dose or 150 mL bag for 6 gram loading dose
  - 500 mL maintenance bag containing 20 grams of magnesium sulfate
- Administration via controlled infusion pump with free-flow protection
- Color-coded IV lines, pump ports/channels, and IV ports
- Independent RN double-check of all doses and IV pump settings
- Dual RN bedside review of medication, settings, and patient condition at each handoff
- Appropriate RN-to-woman staffing ratios
Encouraging human milk feeding

Human milk is the optimal form of nutrition for newborns. Provision of human milk is a key intervention for improving outcomes in preterm infants (AAP, 2012).

- It improves development of immune system defenses.
- Human milk feeding improves long-term neurodevelopmental outcomes:
  - Extremely preterm infants who received more human milk relative to other forms of nutrition in the NICU had higher scores on tests of motor, behavioral, and cognitive function at 18 and 30 months of age.
  - Longer term studies showed higher brain volume, increased white matter, and higher IQ scores in children tested at 8 years of age and up.
- Human milk feeding may have long-term impact on metabolism. It is associated with improved lipid profiles, leptin and insulin metabolism, and lower rates of metabolic syndrome.
Preparing for lactation and breastfeeding

- Hospital routines and outdated practices are a key barrier to provision of human milk to premature and ill newborns (AAP, 2012; Lee & Gould, 2009).
- Families at highest risk for poor outcomes may be the least supported to provide breast milk for their infants (AAP, 2012; Lee & Gould, 2009).
- Early discussion of the importance of providing human milk for the infant is a critical educational emphasis for families at risk for PTB.
- Providing milk is one of the few things a mother of a premature or ill newborn can control in the immediate newborn period and throughout a NICU stay (McInnes et al., 2010).
  - Mothers separated from their infants in the NICU should be provided with a breast pump and supported in initiating lactation right after birth.
  - Mothers of preterm infants old enough to nurse need early and frequent support and assessment of milk transfer; they usually need to pump to establish milk supply and may need to provide supplemental milk.

"Breastfeeding and human milk are the normative standards for infant feeding and nutrition...Infant nutrition should be considered a public health issue and not only a lifestyle choice." — AAP, 2012, p.e827

Preparing for imminent preterm birth

- Imminent preterm birth may be spontaneous or indicated. For women with spontaneous PTL, the goal is to maintain pregnancy as long as possible. In some situations, the risks to the mother or fetus of continuing pregnancy may outweigh fetal benefits usually obtained from prolonging gestation (Spong et al., 2011).
- Preterm birth may be indicated for maternal or fetal benefit, or both; maternal and fetal benefits and risks may not always be aligned.

<table>
<thead>
<tr>
<th>Indications for preterm birth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal</td>
</tr>
<tr>
<td>Severe preeclampsia</td>
</tr>
<tr>
<td>Certain instances of poorly controlled diabetes or hypertension</td>
</tr>
<tr>
<td>Fetal</td>
</tr>
<tr>
<td>Growth restriction</td>
</tr>
<tr>
<td>Certain congenital malformations</td>
</tr>
<tr>
<td>Certain multiple gestations</td>
</tr>
<tr>
<td>Oligohydramnios</td>
</tr>
</tbody>
</table>
Clear communication between parents and the neonatal or pediatric team is essential for effective planning and intervention.
- Is resuscitation planned for infants at the border of viability?
- Have history and risk factors been clearly conveyed to neonatal team?
- Has timing of specific interventions, such as delayed cord clamping and intubation, been discussed?

Something to think about...
How does a nurse support a woman and her family who are experiencing imminent preterm birth?

Objective 4:
Identify patient safety risks associated with management of PTL
Managing patient safety risks

  - Women receiving treatment for PTL or PPROM need to receive the right treatment in the right facility at the right time.
  - Women may be at risk for giving birth at a facility that cannot provide optimal maternal or neonatal care.
  - Women may be at risk for changes in their condition, such as increased uterine activity, infection and deteriorating fetal status, that require prompt attention.
- Considerations for patient safety for PTL and PPROM include:
  - Location and level of evidence-based care
  - Medication safety
  - Availability of appropriate surveillance for changes in condition
  - Availability of psychosocial support for maternal well-being

Facilities need clear interdisciplinary guidelines for:
  - Timely diagnosis
  - Treatment
  - Staffing
  - Monitoring
  - Communication
  - Transport

Something to think about...
What are three specific steps you could take to address and perhaps relieve some of the patient and family anxiety associated with transport from one facility to another?
### Objective 4: Safety risks

According to AWHONN (2010) staffing recommendations, the following ratios are suggested for managing patient safety risks:

<table>
<thead>
<tr>
<th>Clinical situation</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triage assessment</td>
<td>1 RN: 1 woman</td>
</tr>
<tr>
<td>Antepartum patients Unstable</td>
<td>1 RN: 1 woman</td>
</tr>
<tr>
<td>Stable with complications</td>
<td>1 RN: 3 women</td>
</tr>
<tr>
<td>Magnesium sulfate infusion</td>
<td></td>
</tr>
<tr>
<td>First hour</td>
<td>1 RN in continuous bedside attendance</td>
</tr>
<tr>
<td>After the first hour</td>
<td>1 RN: 1 woman until the woman is no longer contracting to the degree that preterm birth is imminent; 1 RN: 3 women when contractions have subsided to the degree that preterm birth is not imminent</td>
</tr>
</tbody>
</table>

### Objective 5:

Describe three nursing interventions to support the psychosocial well-being of women who are hospitalized during the antepartum period.
Nursing support

Nurses can provide support to women and families at risk for PTB by working to understand the complexity of emotions and strains women and their families are subject to when these complications arise.

Emotional aspects of preterm birth

- Fear
- Anxiety
- Loss of control
- Sense of failure
- Sense of blame
- Concern for baby
- Concern for well-being of their family

*Overriding concern over maternal well-being

Alcalde, 2011; Halton, 2010; O’Brien, Quenby & Lavender, 2010; Palmer & Crotty, 2006; Rattasumpum & Rains, 2008

“Families, however they are defined, are essential to patients’ health and well-being and are crucial allies for quality and safety within the health care system.”
— Johnson et al., 2008, p.vi

While assessment and intervention for threatened PTB may be routine care for many labor and delivery staff, it is never routine for the woman and her family.

Some cultures view pregnancy complications as fate beyond their control (Rattasumpum & Rains, 2008), but many women have a profound sense of failure and self-blame that can be exacerbated by insensitive interactions with nurses, midwives and physicians.

Women who are evaluated for early preterm labor and sent home for “false labor” may still be at risk for late preterm birth. These women require close follow-up and support (Chao et al., 2011).

Something to think about...
What can you do at your facility to improve the experience and quality of care for women and families with threatened preterm birth?
“Living alongside” threatened PTB

“The work of doing nothing was very hard to do.”
— Mackinnon, 2006, p.704

- In a qualitative study with women who had experienced episodes of preterm labor, Mackinnon (2006) described the intense work involved in “living alongside the threat of preterm labor” (p.705) after the assumptions of normal pregnancy are disrupted and fetal health is in peril.
  - During the immediate stabilization period, a woman’s focus may be on medical treatment, but arranging the logistics of suspending daily routines of employment, childcare, home life and other responsibilities takes real work.
  - For women who are hospitalized, the work of suspending their lives outside the hospital can be significant. They often remain responsible for organizing logistics from a distance and may not always have personal or financial supports to draw from.

- Many women are concerned about over-burdening spouses, partners, family and friends who have their own employment, childcare and household responsibilities.
- Giving up routine family caregiving for the sake of a baby’s health presents a level of strain for women that is not always recognized by health care providers.
- Mackinnon (2006) and Palmer & Carty (2006) find that women at risk for PTB struggle to balance paying attention to changes in symptoms without “obsessing” or “over-reacting”.
  - Women monitored for PTB at home found it perplexing when warning symptoms turned out to be “nothing” when they presented for evaluation. Women experienced humiliation and frustration when bodily perceptions were not validated by professional assessments.
  - Palmer & Carty suggest that this process can cause women to brush off symptoms previously minimized by professionals, sometimes to an extent that exceeds desirable guidelines for reassessment.
Women and families managing threatened PTB face multiple challenges, including basic logistics, general worry and activity restriction, whether treated in the hospital or at home. Medical recommendations and routines tend to be organized around institutional norms and clinician convenience and may not adequately account for the life circumstances of women and their families.

“What you feel and what they [the doctors and nurses] see are so unbelievably different that the only possible explanation is you’re a wuss or you’re crazy. There’s just too big a chasm between the two things, which is why I think they don’t believe you….It’s even worse than that…you start to doubt what you feel. And then how are you supposed to do that when what you feel is the only way that you’re supposed to know whether it’s the real deal?”
— Palmer & Carty, 2006, p.511-512

Women hospitalized for PTB are stressed by lack of privacy and personalization of care, as well as the difficulty of adjusting to the work of doing nothing (Richter, Parkes and Chaw-Kant, 2007).

The societal assumption that the family is privately responsible for the care work of preventing preterm birth after discharge to home results in a lack of support systems and resources for families during this high stress time (Mackinnon, 2006).

Women found it frightening to be responsible for deciding if was safe to stay home versus return to the hospital or clinic for evaluation.
Supporting women

For all women facing threatened PTB, nurses can encourage healthy nutrition, smoking cessation, and substance treatment as indicated.

<table>
<thead>
<tr>
<th>Recommendations for supporting women</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antepartum hospitalization</strong></td>
</tr>
<tr>
<td>• Provide family-centered care.</td>
</tr>
<tr>
<td>• Provide access to technology and suggestions for use:</td>
</tr>
<tr>
<td>- Online support (e.g., Sidelines)</td>
</tr>
<tr>
<td>- Social networking</td>
</tr>
<tr>
<td>- Video conferencing or video chat</td>
</tr>
<tr>
<td>• Provide linkage to other patients through buddies or support groups.</td>
</tr>
<tr>
<td>• Attend to personal needs, including privacy, hygiene, hair care, and clothes.</td>
</tr>
<tr>
<td>• Provide access to outdoor space and physical activity or physical therapy.</td>
</tr>
<tr>
<td>• Provide NICU orientation, antenatal classes and breastfeeding classes.</td>
</tr>
<tr>
<td>• Develop pet visitation or pet therapy.</td>
</tr>
<tr>
<td>• Consider a massage program.</td>
</tr>
<tr>
<td><strong>Discharge home</strong></td>
</tr>
<tr>
<td>• Assess resources for home care.</td>
</tr>
<tr>
<td>• Provide time for questions, discussing discharge plans, sharing fears and concerns about being at home and teach-back for signs and symptoms requiring evaluation.</td>
</tr>
<tr>
<td>• If activity restriction is prescribed, delineate the levels and types of activity that are off-limits, including climbing stairs, cooking and lifting a toddler.</td>
</tr>
<tr>
<td>• Provide print and online resources.</td>
</tr>
<tr>
<td>• Encourage and support return for evaluation of symptoms.</td>
</tr>
</tbody>
</table>

Adler, 2002; Albrecht et al., 2004; Makoni & Ruthi, 2000

Supporting spouses and partners

- Across studies, women noted that their spouses are heavily burdened by the circumstances of threatened preterm birth; yet providers rarely considered them a target of intervention or concern (Mackinnon, 2006; O’Brien et al., 2010; Palmer & Carty, 2006; Richter et al., 2007).
  - Spouses or partners may take on high levels of financial and emotional stress, as well as home care and/or childcare responsibilities, while trying to maintain work or school commitments and provide emotional support for their partners.
  - Providers need to acknowledge these issues and offer support services, including:
    - Offering practical suggestions to spouses and partners for asking for help, dealing with other children, developing realistic plans and maintaining positive family routines
    - Developing a Health Insurance Portability and Accountability Act (HIPAA)-compliant partner’s support group, buddy system or listserv
Supporting children and families

Children experience concern, frustration and loss consistent with their developmental age and may benefit from support specifically tailored to their stage of development (McCue, 2003).

- Children may blame themselves for things going wrong for their mother or the baby.
- Toddlers don’t understand separation between themselves and parents, yet they want to do things for themselves. They may be clingly, confused, whiny, and frustrated. They may be very active.
- School-age children understand more but may feel left out and angry. Anger can be a cover for concern or insecurity.

Suggestions for parents

- Schedule regular structured time:
  - Story time, even for older kids and even if by video or phone
  - Video chat, phone calls or texts
  - Become a pen-pal: send letters, drawings or lunchbox notes.
  - Record a favorite book or story for the child.
  - Encourage the child to share the hospital bed or couch with mom: camp out under the covers, have a picnic-in-place, make up games to play.
- For school-age children, provide reasonable reassurance and open communication.

Components of a comprehensive care program

Comprehensive care for women with high-risk antepartum complications is multifaceted and should engage women, families, nurses, physicians and other providers in personalized, holistic care. Components include (Roudebush et al., 2006; Thorman & McLean, 2006):

- Nursing and medical care based on current, best-available evidence
- Assessment of stressors from complications, hospitalization, home care, family disruption and economic concerns
- Culturally and spiritually appropriate care and support resources
- Ongoing, paced, antenatal education tailored to the specific condition, gestational age and prognosis for the woman and her baby
- Ongoing communication with NICU staff and support services
Components of a comprehensive program

- Formal support referrals for virtual or in-house programs; access to internet-based communications, recreational activities and outdoor exposure
- Family-friendly spaces and activities
- Physical therapy services
- Regular interdisciplinary patient-/family-centered rounds
- Family involvement in design, implementation and program evaluation

Something to think about...
What aspects of a comprehensive antepartum program does your hospital or clinic most need?

Conclusion

- The experience of threatened preterm birth, whether through PTL, PPROM or other pregnancy complications, is a crisis for women and their families. It is essential that nurses treat women and families with dignity and respect, as full partners in care.
- Despite decades of research, the exact mechanisms of PTL and PPROM remain elusive, as do the means to prevent them. Increasing focus on differences in pathways to preterm birth is likely to enhance our understanding of mechanisms and prevention (Kramer et al., 2011).
- Nurses are charged with ensuring that high-quality, safe, evidence-based care is appropriately implemented to improve outcomes for infants born prematurely and to support families in the process of managing a pregnancy crisis. Fulfilling this charge may entail changing practices from “the way we’ve always done things” to collaborate with families and clinical colleagues in aligning practice with new evidence and guidelines for excellence.
Intrapartum Nursing Management of Preterm Labor

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