Indicated Late Preterm Birth: Timing Is Key

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National Institutes of Health
I have no conflicts of interest related to this presentation
Objectives

- To describe the problem of late preterm birth
- Describe the risks and benefits of continuation of pregnancy vs delivery in the late preterm period
- Identify those conditions that may benefit from delivery in the late preterm period
- Define optimal timing for delivery for specific conditions that may benefit from late preterm birth
Workshops have highlighted and refined the terminology and implications of “preterm” and “term” birth.
2005 NICHD Workshop

- “Near-term”
  - poorly defined, irregularly reported; yet, have higher morbidities and mortality than term
  - misnomer

- “Late preterm” preferred terminology
  - AAP, ACOG, CDC, & MOD

- A paradigm shift in thinking: Pub-Med search:
  - 12 papers on near term before December 2005
  - >400 papers on “late-preterm” since January 2006 to June 2010
Defining “Term” Pregnancy
Recommendations From the Defining “Term” Pregnancy Workgroup

Catherine Y. Spong, MD

The national emphasis on delaying preterm birth, and the increase in scheduled deliveries, has created confusion around the definition of term gestation. The concept of “term” gestation provides guidance to clinicians and influences the public's perception of obstetric care. This viewpoint review will provide recommendations from the American College of Obstetricians and Gynecologists Committee on Obstetric Practice and the Society for Maternal-Fetal Medicine following the international workshop held in Bethesda, Maryland, on December 17, 2012.

Committee Opinion

The American College of Obstetricians and Gynecologists Committee on Obstetric Practice
Society for Maternal-Fetal Medicine

This document reflects emerging clinical and scientific advances as of the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed.

Definition of Term Pregnancy

ABSTRACT: In the past, the period from 3 weeks before until 2 weeks after the estimated date of delivery was considered “term,” with the expectation that neonatal outcomes from deliveries in this interval were uniform and good. Increasingly, however, research has shown that neonatal outcomes, especially respiratory morbidity, vary substantially with the timing of delivery.

Spong et al JAMA 2013 309(23):2445-6
ACOG CO#579 Obstet Gynecol 2013;122; 1139-40
### Gestational Age (wks) Definitions

<table>
<thead>
<tr>
<th>Gestational Age (wks)</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;37.0</td>
<td>Preterm</td>
</tr>
<tr>
<td>34.0-36 6/7</td>
<td>Late preterm</td>
</tr>
<tr>
<td>37.0-38 6/7</td>
<td>Early term</td>
</tr>
<tr>
<td>39.0-40 6/7</td>
<td>Full term</td>
</tr>
<tr>
<td>41.0-41 6/7</td>
<td>Late term</td>
</tr>
<tr>
<td>42.0 +</td>
<td>Post term</td>
</tr>
</tbody>
</table>

Spong et al *JAMA* 2013 309(23):2445-6
Preterm Birth: Outcomes

- Leading cause of neonatal mortality
- Accounts for
  - 1 out of 5 children with mental retardation
  - 1 out of 3 children with vision impairment
  - Almost half of children with cerebral palsy
- Long-term implications
  - Heart disease, diabetes
  - Maternal: subsequent PTB
Preterm and Late PTB in US: 2008

- 523,033 preterm births
  - 12.3% of live births
- 372,161 late preterm births
  - 8.8% of live births
  - 71% of preterm births
- 1998 to 2008: LPTB rate increased ~9%

National Center for Health Statistics, final natality data
Retrieved April 21, 2011 from www.marchofdimes.com/peristats
Mortality was Affected by the Indication for Delivery at Each Gestation

- Neonatal and infant mortality rates are increased with each decreasing gestational age
- At each gestational age strata, “no recorded indications” group had 30%-40% higher mortality than spontaneous preterm births

*Delivery Indications at Late-Preterm Gestations and Infant Mortality Rates in the United States*
Uma M. Reddy, Chia-Wen Ko, Tonse N.K. Raju and Marian Willinger
*Pediatrics* 2009;124;234-240
LPTB: Mortality

- Early Neonatal (0-6 d): 6 x Term
- Late Neonatal (7-28 d): 2 x Term
- Infant (birth – 1 year): 3 x Term

Increased risk persists after excluding congenital anomalies

- Late preterm births: 2,221,545 (7.3%)
- Late preterm deaths: 18,484 (9.8%)


Tomashek et al, J Peds. 2007;151:460-6
Late Preterm Birth: Outcomes

US projections based on 9.1% LPTB rate: $1.4 billion dollars

Wang et al, Pediatr 114:372, 2004
McIntire and Leveno, Obstet Gynecol, 2008;111:35-41
LPTB & ETB Morbidities:
Adjusted Odds Ratio by GA at birth

Data from 19 hospital births between 2002-2008, 20,000 Late preterm and 166,000 Term births

Readmission Diagnoses for Late Preterm Infants Discharged Early

Re-hospitalization rates for late-preterm infants 2-4 times higher

- Jaundice 49%
- Infection 29%
- Birth defects 3%
- Digestive disorders 5%
- Fever 3%
- Respiratory problems 3%
- Feeding difficulties 3%
- Other 5%

Slide Courtesy, Dr. Gabriel Escobar, 2006
LPTB: Long term outcome

Longitudinal cohort linked national database 1967-1983 (n=903,402)
Early School-Age Outcomes of late preterm infants (n=161,804)

Late Preterm birth: increased risk
  - Cerebral palsy
  - Mental retardation
  - Developmental delay/disability
  - Special needs – education
  - Retention in kindergarten

Interim Summary

- Late preterm birth
  - over 70% of preterm births
  - associated with complications
    - Mortality
    - Neonatal complications
    - Developmental abnormalities
US Late Preterm Births: Indications

- Linked birth/death files 2001
- 292,627 births @ 34\(^0\) – 36\(^6\) weeks
- 77\% documented indication or spontaneous labor or PPROM
- 23\% - no documented reason

Highlighting outcomes of late preterm and early term births have led to reductions in PTB
A push for More Pregnancies to Last 39 Weeks

Ten Fingers, Ten Toes ...

Babies need 39 weeks in the womb to develop completely and gain weight. Among the risks for babies born too small are hypothermia, when core body temperature is too low for normal function and metabolism. Such babies may require time in a radiant warmer, in a neonatal intensive care unit.

At 34 weeks, the volume of the cerebral cortex—which controls higher-order functions such as cognition, perception, reason and motor control—is 53% of its volume at 39 to 40 weeks.

Babies born before 39 weeks are more likely to have vision and hearing problems after birth.

Babies born before 39 weeks often can’t learn to suck and swallow well, and they may not be able to stay awake long enough to eat.

Lungs may not be fully developed until 36 to 38 weeks. Even when lungs are fully developed, deliveries between 36 weeks and 38 weeks, 6 days, may still be associated with significantly increased respiratory problems.

Important growth in the liver occurs during the last weeks of pregnancy.

Source: March of Dimes
Nonmedically Indicated Early-Term Deliveries

ABSTRACT: For certain medical conditions, available data and expert opinion support optimal timing of delivery in the late-preterm or early-term period for improved neonatal and infant outcomes. However, for nonmedically indicated early-term deliveries such an improvement has not been demonstrated. Morbidity and mortality rates are greater among neonates and infants delivered during the early-term period compared with those delivered between 39 weeks and 40 weeks of gestation. Nevertheless, the rate of nonmedically indicated early-term deliveries continues to increase in the United States. Implementation of a policy to decrease the rate of nonmedically indicated early-term deliveries may be an important strategy to reduce the adverse outcomes associated with early-term deliveries.
Scheduled elective singleton early-term deliveries by delivery type (%)

Decreased rate of elective early-term deliveries from 27.8% to 4.8%, an 83% decline / 1 year

Early term: 37 0/7–38 6/7 wks

Oshiro et al  Decreasing Elective Deliveries. Obstet Gynecol 2013
US preterm birth rate

PTB increased >20% from 1990 to 2006, declines since 2006
Late Preterm Birth

Has the pendulum swung too far?
Preterm birth may not be all bad…

Prevents fetal death and prolonged exposure of fetus to hostile intrauterine environment
Linked birth/death files 2001
- 292,627 births @ 34\(^0\) – 36\(^6\) weeks
- 77% documented indication or spontaneous labor or PPROM
- 23% - no documented reason

In some specific conditions such as placenta previa and multifetal gestation, preterm birth or early term birth is optimal for the mother, baby or both, because of maternal and/or fetal risks with continued pregnancy.
Balancing risks of continuing pregnancy vs risk of delivery before term
Late Preterm Birth

Overarching risks & benefits

- **Risks:**
  - Newborn: GA dependent morbidities - RDS, IVH, NEC, hyperbilirubinemia, feeding difficulties, temperature instability
  - Maternal: complications of labor induction - CD, hemorrhage, infection

- **Benefits**
  - Fetal/newborn: avoid stillbirth, fetal compromise
  - Maternal: resolution of underlying condition, prevention of worsening of condition
Late PTB Considerations

- Accuracy of dating
- Amniocentesis
- Administration of antenatal steroids
- Informed decision making
- Multiple complications
Indicated Late PTB

- Placental/uterine conditions
- Fetal conditions
- Maternal conditions
Placental conditions:

- Placenta Previa, accreta/increta/percreta

- Incidence: 0.3% of pregnancies

- Risk of continued pregnancy:
  - unscheduled delivery due to hemorrhage/labor
  - decreased availability of resources
  - fetal/neonatal hypoxemia/acidemia from maternal hypovolemic shock

Placenta previa
Placenta accreta
Placental conditions

Placenta Previa: Risk of emergent bleed

- Placenta accreta: 44% will require emergency surgery if delivery planned >36 wks

Zlatnik et al J Mat Fet Neo Med 2007
Zlatnik et al J Reprod Med 2010
Warshak et al Obstet Gynecol 2010
<table>
<thead>
<tr>
<th>Placental conditions: Timing of LPTB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placenta previa*</td>
</tr>
<tr>
<td>Placenta accreta/increta/percreta</td>
</tr>
<tr>
<td>with placenta previa*</td>
</tr>
</tbody>
</table>

*Uncomplicated, thus no FGR, superimposed PE, etc; in these situations earlier delivery may be indicated

**GA in completed weeks, “36 weeks” includes 36 weeks and 0 days through 36 weeks and 6 days
Placental conditions:
Risk of uterine rupture: Prior classical CD, myomectomy

- Incidence: 0.3% of pregnancies with prior upper segment uterine incision
- Prior myomectomy: CD often recommended if muscular portion of myometrium involved
- Risk of continued pregnancy:
  - Uterine rupture with hemorrhage, shock, transfusion, stillbirth, fetal/neonatal hypoxia/acidosis
## Placental conditions: Timing of LPTB

<table>
<thead>
<tr>
<th>Condition</th>
<th>Recommended GA Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior classical*</td>
<td>36-37 weeks</td>
</tr>
<tr>
<td>Prior myomectomy where CD is recommended*</td>
<td>37-38 weeks</td>
</tr>
</tbody>
</table>

*Uncomplicated, thus no FGR, superimposed PE, etc; in these situations earlier delivery may be indicated

**GA in completed weeks, “36 weeks” includes 36 weeks and 0 days through 36 weeks and 6 days
Indicated Late Preterm and Early Term Births: Placental and Uterine Conditions

Prior myomectomy* 37-38 weeks
Prior classical 36-37 weeks
Previa 36-37 weeks
Accreta 34-35 weeks
Fetal conditions:

Fetal growth restriction

- Incidence
  - <10th centile: 10% singletons
  - 20-25% multiples
  - Twins: 20% discordance in size

- Risk of continued pregnancy
  - Stillbirth, long-term neurologic sequelae
Indicated Late Preterm and Early Term Births: Fetal Conditions: Growth Restriction

- Expeditious delivery regardless of gestational age
- Persistent abnormal fetal surveillance suggesting imminent fetal jeopardy

Graph showing:
- Complicated births: 34-37 weeks
- Uncomplicated births: 38-39 weeks
Fetal conditions:  
Congenital anomalies

- **Incidence:**
  - 2% with major congenital anomalies
  - 1% with anomalies that require delivery planning

- **Risk of continued pregnancy:**
  - Specific to anomaly
    - May include PIH, mirror syndrome, polyhydramnios, stillbirth

- Many fetal anomalies do not benefit from LPTB
Indicated Late Preterm and Early Term Births: Fetal Conditions: Congenital Malformations

Individualize
- Suspected worsening organ damage
- Potential for ICH
- Delivery prior to labor desired
- Concurrent medical conditions
- Potential maternal risk from fetal condition

Most cases 39+ weeks
Fetal conditions: Multiple gestations - Twins

- Incidence: 3% of pregnancies
  - 50% delivery preterm, 30% LPTB
- Risk of continued pregnancy:
  - Maternal complications (PIH), stillbirth, fetal growth abnormalities, emergent delivery
- Other issues
  - Chorionicity and amnionicity
  - Demise of one twin
  - Other complications (FGR, TTTS, etc)
Fetal conditions – Twins: Timing of LPTB

<table>
<thead>
<tr>
<th>Condition</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dichorionic/diamniotic*</td>
<td>38 weeks</td>
</tr>
<tr>
<td>Dichorionic/monoamniotic*</td>
<td>34-37 weeks</td>
</tr>
<tr>
<td>Di/Di or Mono/Di with single fetal demise*</td>
<td>&gt;34w consider delivery &lt;34w individualize</td>
</tr>
<tr>
<td>Monochorionic/monoamniotic*</td>
<td>32-34 weeks</td>
</tr>
<tr>
<td>Monochorionic/monoamniotic with single fetal demise*</td>
<td>when demise identified (&gt;34 wks)</td>
</tr>
</tbody>
</table>

*Uncomplicated, thus no FGR, superimposed PE, etc; in these situations earlier delivery may be indicated

**GA in completed weeks, “36 weeks” includes 36 weeks and 0 days through 36 weeks and 6 days
Indicated Late Preterm and Early Term Births: Uncomplicated Twins

- Dichorionic diamniotic: 38 weeks
- Monochorionic-diamniotic: 34-37 weeks
- Monochorionic-monoamniotic: 32-34 weeks
Indicated Late Preterm and Early Term Births: Twins with Single Fetal Death

Dichorionic-diamniotic or Monochorionic-diamniotic at diagnosis

Monochorionic-monoamniotic at diagnosis
Twins with FGR Timing of LPTB

- **36-37 weeks:**
  - Dichorionic-diamniotic twins with isolated fetal growth restriction

- **32-34 weeks:**
  - Monochorionic-diamniotic twins with isolated fetal growth restriction
  - Concurrent conditions (oligohydramnios, abnormal Dopplers, maternal risk factors, co-morbidity)

- **Expeditious delivery regardless of gestational age**
  - Persistent abnormal fetal surveillance suggesting imminent fetal jeopardy
Indicated Late Preterm and Early Term Births: Twins with Growth Restriction

Monochorionic-diamniotic or Complicated Di-di 32-34 weeks

Dichorionic-diamniotic 36-37 weeks
Fetal conditions: Oligohydramnios

- Incidence: 2-5% at 34-36 wks
  - SDP ≤2cm or AFI ≤ 5cm
- Risk of continued pregnancy:
  - stillbirth

Timing of Delivery

- Isolated and persistent oligohydramnios* 36-37 weeks

*Uncomplicated, thus no FGR, superimposed PE, etc; when earlier delivery may be indicated
**GA in completed weeks, “36 weeks” = 36 weeks and 0 days through 36 weeks and 6 days
Indicated Late Preterm and Early Term Births: Fetal Conditions: Oligohydramnios

Isolated and persistent 36-37 weeks
Maternal and Obstetrical conditions
Pregnancy related hypertension (GHTN, PE)

- Incidence: gestational HTN
  - 30% of nullipara
  - Majority develops after 38 wks

- Risk of continued pregnancy:
  - Development of severe PE and its complications, fetal complications (FGR, asphyxia, abruption, stillbirth)
### Hypertension & Preeclampsia

#### Timing of LPTB

<table>
<thead>
<tr>
<th>Condition</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>cHTN – no medications*</td>
<td>LPTB not recommended</td>
</tr>
<tr>
<td>cHTN – controlled on meds*</td>
<td>LPTB not recommended</td>
</tr>
<tr>
<td>cHTN – difficult to control (multiple adjustments)*</td>
<td>36-37 weeks</td>
</tr>
<tr>
<td>Gestational HTN*</td>
<td>LPTB not recommended</td>
</tr>
<tr>
<td>Preeclampsia - mild*</td>
<td>37 weeks</td>
</tr>
<tr>
<td>Preeclampsia - severe*</td>
<td>At diagnosis (&gt;34wks)</td>
</tr>
</tbody>
</table>

*Uncomplicated, thus no FGR, superimposed PE, etc; when earlier delivery may be indicated

**GA in completed weeks, “36 weeks” includes 36 wks and 0 days through 36 wks 6 days
Indicated Late Preterm and Early Term Births: Hypertension & Preeclampsia

- **LPD – ETD not indicated**
- Uncomplicated CHTN (+/- meds)
- Gestational hypertension

**Gestational Hypertension**
- **Mild PE**
  - 37 weeks
- **Difficult to control cHTN**
  - 36-37 weeks
- **Severe PE**
  - At diagnosis > 34 wks
Maternal & Obstetrical conditions

Diabetes Mellitus

- Incidence:
  - 7-15% GDM
  - 3-4% pregestational DM

- Risk of continued pregnancy:
  - Macrosomia, birth trauma, stillbirth, cesarean delivery
Indicated Late Preterm and Early Term Births: Diabetes

LPD – ETD not recommended
Uncomplicated DM and GDM

DM or GDM – poorly controlled
individualize

DM – vascular disease
37-39
Fetal conditions:

Prior stillbirth

- Incidence:
  - SB in 5-12/1000 live births
  - Recurrence of SB: up to 8%

- Risk of continued pregnancy:
  - Recurrent stillbirth, FGR, preeclampsia, maternal anxiety

**Timing of Delivery**

- Prior unexplained stillbirth*

  LPTB not recommended

  Consider amniocentesis if delivered at 37-38 wks

*Uncomplicated, thus no FGR, superimposed PE, etc; when earlier delivery may be indicated
Indicated Late Preterm and Early Term Births: Fetal Conditions: Prior Stillbirth

LPD – ETD not recommended

Uncomplicated

Consider amniocentesis if delivered at 37-38 weeks
Fetal conditions: PROM

- Incidence:
  - 1% preterm PROM
- Risk of continued pregnancy:
  - Stillbirth, chorioamnionitis

Timing of Delivery

- Spontaneous PROM*  
  - 34 weeks
  - Deliver for progressive PTL
- Spontaneous PTL*

*Uncomplicated, thus no FGR, superimposed PE, etc; when earlier delivery may be indicated
Indicated Late Preterm and Early Term Births: Preterm Labor & PROM

- **PROM**
  - Deliver at diagnosis (>34 wks)

- **Preterm Labor**
  - Deliver for progressive labor, other complications
Indicated LPTB: It’s About Time(ing)

- Recommendations based on a NICHD workshop held February 2011 in conjunction with the Society for Maternal Fetal Medicine

Timing of Indicated Late-Preterm and Early-Term Birth

Catherine Y. Spong, MD, Brian M. Mercer, MD, Mary D’Alton, MD, Sarah Kilpatrick, MD, PhD, Sean Blackwell, MD, and George Saade, MD

*Obstet Gynecol* 2011;118:323-333
Table 1. Guidance Regarding Timing of Delivery When Conditions Complicate Pregnancy at or After 34 Weeks of Gestation

<table>
<thead>
<tr>
<th>Condition</th>
<th>Gestational Age* at Delivery</th>
<th>Grade of Recommendation*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placental and uterine issues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Placenta previa</td>
<td>36-37 wk</td>
<td>B</td>
</tr>
<tr>
<td>Suspected placenta accreta, increta, or percreta with placenta previa*</td>
<td>34-35 wk</td>
<td>B</td>
</tr>
<tr>
<td>Prior classical cesarean (upper segment)</td>
<td>36-37 wk</td>
<td>B</td>
</tr>
<tr>
<td>Prior myomectomy necessitating cesarean delivery*</td>
<td>37-38 wk (may require earlier delivery, similar to prior classical cesarean in situations with more extensive or complicated myomectomy)</td>
<td>B</td>
</tr>
<tr>
<td>Fetal issues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fetal growth restriction—singleton</td>
<td>38-39 wk</td>
<td>B</td>
</tr>
<tr>
<td>- Otherwise uncomplicated, no concurrent findings</td>
<td>38-37 wk</td>
<td>B</td>
</tr>
<tr>
<td>- Concurrent conditions: oligohydramnios, abnormal Doppler studies, maternal risk factor, co-morbidity*</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>- Expeditious delivery regardless of gestational age*</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>Fetal growth restriction—twin gestation</td>
<td>36-37 wk</td>
<td>B</td>
</tr>
<tr>
<td>- Dichorionic-diamniotic twins with isolated fetal growth restriction</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>32-34 wk</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>- Monochorionic-diamniotic twins with isolated fetal growth restriction</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>- Concurrent conditions: oligohydramnios, abnormal Doppler studies, maternal risk factor, co-morbidity*</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>- Expeditious delivery regardless of gestational age*</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>Fetal congenital malformations*</td>
<td>34-39 wk</td>
<td>B</td>
</tr>
<tr>
<td>- Suspected worsening of fetal organ abnormality</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>- Potential for fetal intracranial hemorrhage, e.g., von Willebrand disease, neuroblastoma, thrombocytopenia</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>- When delivery prior to labor is desired (e.g., EXIT procedure)</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>- Previous fetal intervention</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>- Concurrent maternal disease (e.g., preeclampsia, chronic hypertension)</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>- Potential for adverse maternal effect from fetal condition</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>- Expeditious delivery regardless of gestational age*</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>- When intervention is expected to be beneficial</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>- Fetal complications develop (abnormal fetal surveillance, new-onset hydrops fetalis, progressive or new-onset organ injury)</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>- Maternal complications develop (eclampsia syndrome)</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Multiple gestations: dichorionic-diamniotic</td>
<td>38 wk</td>
<td>B</td>
</tr>
<tr>
<td>Multiple gestations: monochorionic-diamniotic*</td>
<td>34-37 wk</td>
<td>B</td>
</tr>
<tr>
<td>Multiple gestations: dichorionic-monochorionic-diamniotic with single fetal death*</td>
<td>If occurs at or before 34 wk, consider delivery</td>
<td>B</td>
</tr>
<tr>
<td>(recommendation limited to pregnancies uterine environment, as well as resolution of the underlying condition (e.g., preeclampsia) before worsening or secondary complications develop. Informed decision making and family counseling should consider the risks of the underlying condition and concurrent complications, as well as the potential for reduction of prematurity-related neonatal morbid-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Guidance Regarding Timing of Delivery When Conditions Complicate Pregnancy at or After 34 Weeks of Gestation (continued)

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<th>Condition</th>
<th>Gestational Age* at Delivery</th>
<th>Grade of Recommendation*</th>
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<tbody>
<tr>
<td>Multiple gestations: monochorionic-monoamniotic*</td>
<td>32-34 wk</td>
<td>B</td>
</tr>
<tr>
<td>Multiple gestations: Monochorionic-monoamniotic with single fetal death*</td>
<td>Consider delivery individualized according to gestational age and concurrence complications</td>
<td>B</td>
</tr>
<tr>
<td>Oligohydramnios—isolated and persistent*</td>
<td>35-37 wk</td>
<td>B</td>
</tr>
<tr>
<td>Maternal issues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic hypertension—no medications*</td>
<td>39-36 wk</td>
<td>B</td>
</tr>
<tr>
<td>Chronic hypertension—controlled on medication*</td>
<td>39-36 wk</td>
<td>B</td>
</tr>
<tr>
<td>Chronic hypertension—difficult to control (requiring frequent medication adjustment)</td>
<td>39-36 wk</td>
<td>B</td>
</tr>
<tr>
<td>Gestational hypertension</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>Preeclampsia—eclampsia*</td>
<td>At diagnosis (recommendation limited to pregnancies at or after 34 wk)</td>
<td>C</td>
</tr>
<tr>
<td>Preeclampsia—mild*</td>
<td>37 wk</td>
<td>B</td>
</tr>
<tr>
<td>Diabetes—pregestational well controlled*</td>
<td>LPTB or EIT not recommended</td>
<td>B</td>
</tr>
<tr>
<td>Diabetes—pregestational with vascular disease*</td>
<td>37-36 wk</td>
<td>B</td>
</tr>
<tr>
<td>Diabetes—pregestational, poorly controlled*</td>
<td>LPTB or EIT not recommended</td>
<td>B</td>
</tr>
<tr>
<td>Diabetes—gestational well controlled on medication*</td>
<td>LPTB or EIT not recommended</td>
<td>B</td>
</tr>
<tr>
<td>Diabetes—gestational poorly controlled on medication*</td>
<td>LPTB or EIT not recommended</td>
<td>B</td>
</tr>
<tr>
<td>Obstetric issues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior stillbirth—unexplained*</td>
<td>LPTB or EIT not recommended</td>
<td>B</td>
</tr>
<tr>
<td>Consider amniocentesis for fetal pulmonary maturity if C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spontaneous preterm birth: preterm premature rupture of membranes*</td>
<td>34 wk (recommendation limited to pregnancies at or after 34 wk)</td>
<td>B</td>
</tr>
<tr>
<td>Spontaneous preterm birth: active preterm labor*</td>
<td>Delivery if spontaneous labor or fetal indications</td>
<td>B</td>
</tr>
</tbody>
</table>

* LPTB, late-preterm birth: 34-07 weeks through 36-07 weeks. EIT, early-term birth: 37-07 weeks through 36-07 weeks.
* Gestational age in completed weeks. Thus, 34 weeks includes 34-07 weeks through 34-07 weeks.

Grade of recommendation is based on the following: recommendations or conclusions of both are based on high and consistent scientific evidence (A); limited or inconsistent scientific evidence (B); previously consensus and expert opinion (C). The recommendations regarding expeditious delivery for intracranial hemorrhage were not given a grade. The recommendation severe preeclampsia is based largely on expert opinion however, higher-grade evidence is likely to be forthcoming because this condition is believed to carry significant maternal risk with limited potential fetal benefit from expeditious management after 34 weeks.

* Uncomplicated, thus no fetal growth restriction, superimposed preeclampsia, etc., if these are present, then the complications take precedence and earlier delivery may be indicated.

* Maintenance antihypertensive therapy should be used in all postnatal hypertension.

with labor induction (including increased risk of cesarean delivery, hemorrhage, infection, prolonged hospital stay). The benefits of early delivery may include avoidance of stillbirth or fetal compromise due to unexplained insufficiency, removal of the fetus from a hostile uterine environment, as well as resolution of the underlying condition (e.g., preeclampsia) before worsening or secondary complications develop. Informed decision making and family counseling should consider the risks of the underlying condition and concurrent complications, as well as the potential for reduction of prematurity-related neonatal morbidity.
Medically Indicated Late-Preterm and Early-Term Deliveries

**ABSTRACT:** The neonatal risks of late preterm (34 0/7–36 6/7 weeks of gestation) and early-term (37 0/7–38 6/7 weeks of gestation) births are well established. However, there are a number of maternal, fetal, and placental complications in which either a late-preterm or early-term delivery is warranted. The timing of delivery in such cases must balance the maternal and newborn risks of late-preterm and early-term delivery with the risks of further continuation of pregnancy. Decisions regarding timing of delivery must be individualized. Amniocentesis for the determination of fetal lung maturity in well-dated pregnancies generally should not be used to guide the timing of delivery.

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Indicated LPTB: It’s About Time(ing)

- With the push to reduce PTB and public health awareness of PTB, it is important to realize some PTB benefit mother, baby or both
- Certain conditions optimally deliver in late preterm
- List not all inclusive (eg cholestasis, vasa previa)
- Informed decision making, individualization based on comorbidities and counseling are critical
Balancing risks of continuing pregnancy vs risk of delivery before term
Objectives—accomplished!

- To describe the problem of late preterm birth
- Describe the risks and benefits of continuation of pregnancy vs delivery in the late preterm period
- Identify those conditions that may benefit from delivery in the late preterm period
- Define optimal timing for delivery for specific conditions that may benefit from late preterm birth
The goal: healthy children, mothers and families…