Elimination of Non-medically Indicated (Elective) Deliveries Before 39 Weeks Gestational Age

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www.CMQCC.org
www.marchofdimes.com/medicalresources_39weeks.html
Elimination of Non-medically Indicated (Elective) Deliveries Prior to 39 Weeks

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- California Maternal Quality Care Collaborative
- March of Dimes
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- California Pacific Medical Center
- Loma Linda University School of Medicine
- Catholic Healthcare West
- California Perinatal Quality Care Collaborative (CPQCC)
- March of Dimes
Objectives

1) Describe the increase in non-medically indicated (elective) deliveries before 39 weeks and identify the contributing factors.

2) Identify the risks of early term deliveries and the benefits of delaying delivery beyond 39 weeks gestation.

3) List and describe successful initiatives to reduce elective deliveries before 39 weeks at hospital, health system and statewide levels.

4) Describe a sample implementation plan for the prevention of elective deliveries before 39 weeks.
Key Points

1) Research has shown that early elective delivery without medical or obstetrical indication is linked to neonatal morbidities with no benefit to the mother or infant.

2) There are numerous maternal and fetal indications for deliveries PRIOR to 39 weeks gestation

3) In addition… this toolkit… is not meant to imply that elective deliveries AFTER 39 weeks have been proven to be without risks for mothers and infants.
Do we have a problem here??

- In 2010, what was the # and % of Scheduled CS and Inductions at 37 to under 39 weeks without a medical/obstetric indication (and not in labor or ROM)?
- KMC it was 15.69% in 2010
- Now at KMC it is <1%

[This is the definition used by The Joint Commission and the Leapfrog Group]
Terminology

First day of LMP

Week # 0 20 0/7 34 0/7 37 0/7 39 0/7 41 6/7

Late Preterm Early Term

Preterm Term "New" Term Post term

Modified from Drawing courtesy of William Engle, MD, Indiana University
Raju TNK. Pediatrics, 2006;118 1207. Oshiro BT Obstet Gynecol 2009;113:804
Rates of Induction of Labor by Race and Hispanic Origin

Scheduled Delivery <39 wks in an Uncomplicated Pregnancy

- Since 1979, ACOG has cautioned against inductions before 39 weeks in the absence of a medical indication (Committee Opinion #22).
- ACOG has also noted that “a mature fetal lung maturity test result before 39 weeks of gestation, in the absence of appropriate clinical circumstances, is not an indication for delivery”. (Committee Practice Bulletins #97 and #107)
U.S. Cesarean Section and Labor Induction Rates

Source: NCHS, Final Natality Data, Prepared by March of Dimes Perinatal Data Center, April 2006.
Change in Distribution of Births by Gestational Age: United States, 1990-2006

Why are non-medically indicated (elective/planned) deliveries increasing in frequency?
Sounds like a good idea…

- Advanced planning
- Convenience
- Delivered by her doctor
- Maternal intolerance to late pregnancy
  - Excess edema, backache, indigestion, insomnia
- Prior bad pregnancy
- And, it’s okay right?
The Gestational Age that Women Considered it “Safe to Deliver”

Obstet Gynecol 2009;114:1254
Lots of Pressures on Obstetricians

- Physician Convenience
  - Guarantee attendance at birth ("co-dependency")
  - Avoid scheduling conflicts
  - Reduce being woken at night

- ...what’s the harm?
  - Bad outcomes are unrecognized and rare
  - The NICU handles these issues just fine

- Limit my risk of a bad pregnancy outcome

- And...payment pressures to deliver own pts
“Non-Medical” Reasons* for Inductions <39 weeks

- Maternal intolerance to late pregnancy
  - Excess edema, backache, indigestion, insomnia
- Prior labor complication
- Prior shoulder dystocia
- Suspected fetal macrosomia
- History of rapid labor/ lives far away
- Possible lower risk for mom or baby
  - Lower stillbirth rate, less macrosomia, less preeclampsia

* Not evidenced-based to show maternal or neonatal benefit
Risks of Non-medically Indicated (Elective) Delivery Before 39 weeks.
Complications of Non-medically Indicated (Elective) Deliveries Between 37 and 39 Weeks

- Increased NICU admissions
- Increased transient tachypnea of the newborn (TTN)
- Increased respiratory distress syndrome (RDS)
- Increased ventilator support
- Increased suspected or proven sepsis
- Increased newborn feeding problems and other transition issues

See Toolkit for more data and full list of citations
Timing of Elective Repeat Cesarean Delivery at Term and Neonatal Outcomes

- 13,258 elective repeat cesarean births in 19 large centers
- 35.8% done <39 weeks gestation
- Increased risk of neonatal morbidity
  - Respiratory, hypoglycemia, sepsis, NICU admissions, hospitalization > 5 days
  - Even among babies delivered between 38 and 39 weeks

Tita AT, et al, NEJM 2009;360:111
Adverse Neonatal Outcomes According to Completed Week of Gestation at Delivery: Absolute Risk

Tita AT, et al, NEJM 2009;360:111
Adverse Neonatal Outcomes According to Completed Week of Gestation at Delivery: Odds Ratios

Any adverse outcome or death

Adverse respiratory outcome (overall)

RDS

TTN

Admission to NICU

Newborn Sepsis (suspected or proven)

Treated hypoglycemia

Hospitalization > 5 days

Odds Ratios

37+ Weeks

38+ Weeks

39+ Weeks

Tita AT, et al, NEJM 2009;360:111
New Concept: U-Shaped Curve for near-term Neonatal Outcomes

- Neonatal outcomes at 37 and 38 weeks are very similar (or worse) than those at 41 and 42 weeks...
- Best outcomes are at 39 and 40 weeks!
NICU Admissions By Weeks Gestation Deliveries Without Complications, 2000-2003

RDS By Weeks Gestation
Deliveries Without Complications, 2000-2003

Ventilator Usage By Weeks Gestation Deliveries Without Complications, 2000-2003

Timing of Fetal Brain Development

- Cortex volume increases by 50% between 34 and 40 weeks gestation. (Adams Chapman, 2008)
- Brain volume increases at rate of 15 mL/week between 29 and 41 weeks gestation.
- A 5-fold increase in myelinated white matter occurs between 35-41 wks gestation.
- Frontal lobes are the last to develop, therefore the most vulnerable.

Mean IQ Scores in 6 yo Children from Healthy Term Pregnancies

13,824 healthy term infants followed for an average of 6.5 years. IQ scores adjusted for multiple factors including: sex, birthweight for gestational age, maternal height and age at birth, smoking and drinking during pregnancy, parental marital status, number of children in the household, parental education and occupation.

Cerebral Palsy among Term and Postterm Births

Norwegian birth cohort of 1,682,441 singleton term births without congenital anomalies followed for a minimum of 4 years (maximum of 20 years) with identified CP in the National Health Insurance Registry.

CP is 2.3x higher at 37wks and 1.5x higher at 38 wks than at 39-41 wks

Moster et al. JAMA 2010;304:976-982.
Caveats on CNS Outcomes…

- Best outcomes are at 40 weeks.
- Note that these studies are associations and cannot show NOT causation.
- Nonetheless, the onus is on us to show that earlier birth is better…
Examples of Successful Programs to Reduce Non-medically Indicated (Elective) Deliveries Before 39 weeks of Gestation

- Magee Women’s Hospital (Pittsburgh)
- Intermountain Healthcare (Utah)
- Hospital Corporation of America (HCA)
- Ohio State Department of Health
Magee-Women’s Hospital’s Experience

- Magee-Womens Hospital is the largest maternity hospital in Western Pennsylvania, performing more than 9,300 deliveries in 2007.

- A rise in the use of induction, reaching a high of 28% in 2003, L&D too busy!

- In 2006, a process improvement initiative changed the induction scheduling process and strictly enforced the guidelines.

- “Elective”: not before 39 weeks and without cervical ripening agents if 39+0 to 40+6).

Fisch et al Obstet Gynecol 2009;113:797
### Magee Women’s Experience with Guidelines

<table>
<thead>
<tr>
<th></th>
<th>Baseline 3mos 2004</th>
<th>Voluntary 3mos 2005</th>
<th>Enforced 14mos 2006-7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deliveries</td>
<td>2,139</td>
<td>2,260</td>
<td>10,895</td>
</tr>
<tr>
<td>Elective Inductions &lt;39wks (N)</td>
<td>23</td>
<td>21</td>
<td>30</td>
</tr>
<tr>
<td>Elective Inductions &lt;39wks (rate)</td>
<td>11.8%</td>
<td>10.0%</td>
<td>4.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(elective inductions &lt;39 / total elective inductions)</td>
<td>(p&lt;0.001)</td>
</tr>
<tr>
<td>Total Induction Rate</td>
<td>24.9%</td>
<td>20.1%</td>
<td>16.6%</td>
</tr>
</tbody>
</table>

“Voluntary”: educational program and dept. recommendations

“Enforced”: Department standard requiring approval by the Perinatal Committee Chair before scheduling non-standard indications for inductions

Fisch et al Obstet Gynecol 2009;113:797
Magee Women’s Experience

“The importance of strong physician and nursing leadership cannot be overstated. The change in the induction scheduling process that began to enforce the guidelines strictly in late 2006 was spearheaded by the OB Process Improvement Committee, whose members included the hospital’s Vice President for Medical Affairs, the Medical Director of the Birth Center, and the nursing leadership for the Birth Center.”

Fisch et al Obstet Gynecol 2009;113:797
Intermountain Healthcare’s Experience

- Intermountain Healthcare is a vertically integrated healthcare system that operates 21 hospitals in Utah and Southeast Idaho and delivers approximately 30,000 babies annually.
- Computerized L&D system.
- MFM’s hired by system, but OBs are independent.
- January 2001: 9 urban facilities participated in a process improvement program for elective deliveries.
- 28% of elective deliveries were occurring before 39 completed weeks of gestation.

% Non-medically Indicated Deliveries <39 Weeks, January 1999 – December 2005

Stillbirths Before and After Implementation of Guidelines at Intermountain Healthcare


### Table 3. Stillbirth Data (1999–2000 and July 2001 to June 2006)

<table>
<thead>
<tr>
<th>Weeks of Gestation</th>
<th>1999–2000</th>
<th></th>
<th></th>
<th>2001–2006</th>
<th></th>
<th></th>
<th></th>
<th>Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stillbirths</td>
<td>Deliveries</td>
<td>%</td>
<td>Stillbirths</td>
<td>Deliveries</td>
<td>%</td>
<td></td>
<td>ODDS RATIO</td>
<td>95% CI</td>
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<tr>
<td>37</td>
<td>17</td>
<td>4,117</td>
<td>0.41</td>
<td>22</td>
<td>13,077</td>
<td>0.17</td>
<td></td>
<td>0.406</td>
<td>0.22–0.77</td>
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<tr>
<td>38</td>
<td>19</td>
<td>9,954</td>
<td>0.19</td>
<td>21</td>
<td>28,209</td>
<td>0.07</td>
<td></td>
<td>0.390</td>
<td>0.21–0.72</td>
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<tr>
<td>39</td>
<td>10</td>
<td>13,752</td>
<td>0.07</td>
<td>28</td>
<td>51,721</td>
<td>0.05</td>
<td></td>
<td>0.744</td>
<td>0.36–1.53</td>
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<tr>
<td>40</td>
<td>10</td>
<td>7,925</td>
<td>0.13</td>
<td>14</td>
<td>24,140</td>
<td>0.06</td>
<td></td>
<td>0.459</td>
<td>0.20–1.03</td>
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<tr>
<td>41</td>
<td>2</td>
<td>1,938</td>
<td>0.10</td>
<td>3</td>
<td>5,571</td>
<td>0.05</td>
<td></td>
<td>0.522</td>
<td>0.09–3.12</td>
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<tr>
<td>All</td>
<td>58</td>
<td>37,686</td>
<td>0.15</td>
<td>88</td>
<td>12,2718</td>
<td>0.07</td>
<td></td>
<td>0.466</td>
<td>0.33–0.65</td>
</tr>
</tbody>
</table>
HCA Study

- HCA: Largest healthcare system in the US with approx 220,000 births annually.
- Cohort study of 27 pilot hospitals in 2007-2009
- Self-selected to either:
  - Group 3—"Education only", provision of literature and ACOG recommendations
  - Group 2—Education and "Soft stop", compliance left to individual physicians, cases reviewed in peer review sessions
  - Group 1—Education and "Hard stop", <39 wk elective procedures are not scheduled unless department criteria are met, exceptions thru chain of command
- Careful distinction among “planned” deliveries between “indicated” and “elective” deliveries

HCA Trial of 3 Approaches for Reduction of Elective Deliveries <39 weeks

Consistent reduction in every hospital

Neonatal Outcomes for HCA Trial

- Stillbirth Rate unchanged:
  - 2007: 0.69%
  - 2009: 0.71%
  - Not significant

- Term NICU Admissions:
  - 2007: 8.9%
  - 2009: 7.5% (decreased 16%)
  - $P<0.001$    RR=0.85
Common Themes

- All started with education provided to obstetricians regarding ACOG guidelines and best practices.
- Modest change at most, until physicians were held accountable, nurses were empowered, and guidelines were enforced (“Hard stop”).
- Medical leadership important.
- Timely access to benchmark data acts as motivator.
The California Maternal Data Center (CMDC) Project Vision

- Build a statewide data center to collect and **timely report** information on maternity care services
- Calculate and benchmark national quality measures in a cost-effective way
- Use data to support **quality improvement projects**
The California Maternal Data Center (CMDC) 
CMQCC and CPQCC

California Maternal Quality Care Collaborative (CMQCC)
- Expertise in maternal data analysis
- Developer of QI toolkits
- Host of collaborative learning sessions
- Multi-stakeholder collaborative
- Developer of maternal quality measures

California Perinatal Quality Care Collaborative (CPQCC)
- Expertise in data capture from hospitals
- Established secure data center
- Data use agreements in place with 130 hospitals with NICUs
- Model of working with state agencies to provide data of value
Tracking $ED<39$ Weeks Performance

Two data sets:

- Patient Discharge Data (e.g., data for OSHPD reporting): dates, diagnoses, procedures
- Pregnancy-specific Data (e.g., birth certificate data from Vital Records): Parity, gestational age, birth weight

- Linking the two is essential for calculating the measure. *Not easy for hospitals to do!*
- Routinely linked and released 2-4 years “after the fact” by “the State”
CMQCC Approach

(1) Discharge Data: Identical to OSHPD PDD submission
BUT:
- More frequent submission than to OSHPD (monthly/quarterly vs. semi-annual)
- SSN stripped
- MRN encrypted during transmission

(2) Birth Data: Expedited birth certificate file from Vital Records

(3) Clinical Data for ED <39 weeks measure (2 only):
- Spontaneous Rupture of Membranes
- Active Labor

Solution: CMDC applies an initial algorithm to significantly reduce the number of patient records requiring very limited chart review (estimated 5-7% of total delivery volume)
CMQCC Maternal Data Center: Overview

Maternal Quality Measures

PDD File (Admin Data)
- Links GA data to OSHPD file
- Runs exclusions
- Identifies CS and Inductions
- Prints list of charts for review

Birth Data File (Vital Records)
- Uploads electronic files

CMQCC Data Center
- Limited data entry
- Calculates the rates

REPORTS
- Benchmarks against other hospitals
- Sub-measure reports

<39wk Elective Delivery
CHART REVIEW
Labor?/SROM?
(~6% of cases for brief review)
Turning the QI Measure into Action

- Once a hospital finds that it has a high rate, how do they drill down to determine where to improve?
- Produce Sub-measure Reports
  - Are you coding poorly (or over coding)? % with Medical Indications
  - Is the issue with CS or with inductions? % CS <39wks and % Induction <39wks
- Provide confidential benchmarking with other hospitals on these sub-measures
- Target quality improvement action steps linked to sub-measures
Participation Requirements

Coordination
- Appoint a site coordinator to act as liaison to CMQCC staff and oversee the hospital’s data submissions.

Compliance with confidentiality standards
- Complete a Participation and Data Use Agreement with CMQCC
- CMQCC has already received IRB Approvals from Committee for Protection of Human Subjects (CPHS)

Data Submissions
- Upload patient discharge data to the CMDC web portal on a monthly or quarterly basis and complete medical chart review for the 5-7% of birth records that require additional information for the ED measure.
- Participate in data quality review sessions with CMQCC staff.

Contact
- Anne Castles at acastles@cmqcc.org or 626-639-3044.
Eliminating Non-medically Indicated (Elective) Delivery Prior to 39 Weeks in “Our Hospital”:

What are the steps to make this happen?
Clinician and/or Patient Desire to Schedule a Non-medically Indicated (Elective) Induction or Cesarean Section

**Physician Leadership**
A. Enforce policy
B. Approve exceptions

**Clinician, Staff & Patient Education**

**Elective Delivery Hospital Policy**

**Reduce Demand**

**Induction / Cesarean Scheduling Process**

**Case NOT Scheduled if Criteria Not Met**

**Public Awareness Campaign**

**QI Data Collection & Trend Charts**
Support for this Initiative comes from across the board

- ACOG strong support
- National Quality Organizations
  - Joint Commission, Leapfrog, NQF measures
- March of Dimes
- Many state collaboratives in California
- State Medicaid programs are exploring options
  - “Do not pay”, withholds, incentives, pre-auths
  - Commercial Insurance has acted in other states
A tool to educate patients

If your pregnancy is healthy, it’s best if your baby is born at 40 weeks.

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

- In the last six weeks of pregnancy, your baby’s brain adds connections needed for balance, coordination, learning and social functioning. During this time, the size of your baby’s brain almost doubles.

- Babies born early have more learning and behavior problems in childhood than babies born at 40 weeks.

- Babies born early are more likely to have feeding problems because they can’t coordinate sucking, swallowing and breathing as well as full-term babies.

- Babies born early are likely to have breathing problems, like apnea. Apnea is when a baby stops breathing.

- Babies born early are more likely to die of sudden infant death syndrome (SIDS). SIDS is when a baby dies suddenly and unexpectedly, often during sleep.

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First Steps (Fundamentals)

- Gather baseline data of <39wk scheduled deliveries and outcomes
- Implement list of “approved” indications
  - Have departmental criteria for making certain diagnoses (e.g. hypertensive complications of pregnancy)
  - Identify strong medical leadership to handle “appeals” for exceptions
  - This list DOES NOT imply that all folks with these diagnoses SHOULD be delivered before 39 weeks
- Implement criteria for establishing gestational age >39 weeks
How Do You Measure Elective Deliveries <39 weeks? 
(The Joint Commission Measure Definition)

<table>
<thead>
<tr>
<th>Denominator</th>
<th>TJC (PC-01) v2011A (latest for 2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>37+0 to 38+6 week births without a STANDARD medical or OB complication</td>
</tr>
<tr>
<td>Numerator</td>
<td>Inductions and CS NOT in Active Labor or with ROM</td>
</tr>
<tr>
<td>Benchmark</td>
<td>?? &lt;5-6%</td>
</tr>
</tbody>
</table>

https://manual.jointcommission.org/bin/view/Manual/WebHome
<table>
<thead>
<tr>
<th>ACOG: “Examples of maternal or fetal conditions that may be indications for induction of labor”(^{11})</th>
<th>The Joint Commission: National Quality Core Measure PC-01-- Specifications for “Conditions justifying delivery &lt;39 weeks”(^{19})</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Abruptio placenta</td>
<td>• Placental abruption, placenta previa, unspecified antenatal hemorrhage</td>
</tr>
<tr>
<td>• Fetal demise</td>
<td>• Fetal demise, fetal demise in prior pregnancy</td>
</tr>
<tr>
<td>• Post-term pregnancy</td>
<td>• Post-term pregnancy</td>
</tr>
<tr>
<td>• Premature rupture of membranes</td>
<td>• Rupture of membranes prior to labor (term or preterm)</td>
</tr>
<tr>
<td>• Gestational hypertension, preeclampsia, eclampsia, chronic hypertension</td>
<td>• Gestational hypertension, preeclampsia, eclampsia, chronic hypertension</td>
</tr>
<tr>
<td>• Maternal medical conditions, e.g., diabetes, renal disease, chronic pulmonary disease, antiphospholipid syndrome</td>
<td>• Preexisting diabetes, gestational diabetes</td>
</tr>
<tr>
<td></td>
<td>• Renal disease</td>
</tr>
<tr>
<td></td>
<td>• Maternal coagulation defects in pregnancy (includes anti-phospholipid syndrome)</td>
</tr>
<tr>
<td></td>
<td>• Liver diseases (including cholestasis of pregnancy)</td>
</tr>
<tr>
<td></td>
<td>• Cardiovascular diseases (congenital and other)</td>
</tr>
<tr>
<td></td>
<td>• HIV infection</td>
</tr>
<tr>
<td>• Fetal compromise, e.g., severe Intrauterine Growth Restriction (IUGR), isoimmunization, oligohydramnios</td>
<td>• IUGR, oligohydramnios, polyhydramnios, fetal distress, abnormal fetal heart rate</td>
</tr>
<tr>
<td></td>
<td>•Isoimmunization (Rh and other), fetal-maternal hemorrhage</td>
</tr>
<tr>
<td></td>
<td>• Fetal malformation, chromosomal abnormality, or suspected fetal injury</td>
</tr>
</tbody>
</table>

**These are not exhaustive lists! But close… (e.g. prior classical CS)**
Caveats about the Indication List

- The Joint Commission list was developed for ease of data collection utilizing ICD-9 codes.
- If there is not an ICD-9 code for an indication, they did not list it (e.g. prior classical CS).
- Everyone understands that there are cases in which earlier delivery is indicated and but the indication is NOT on the list—but these should be uncommon.
- No one is expecting a ZERO rate.
- Off-list indications should be prospectively scrutinized.
Confirmation of Term Gestation

- Ultrasound measurement at less than 20 weeks of gestation supports gestational age of 39 weeks or greater (confirming LMP)
  - Ultrasound-established dates should only take precedence over LMP-established dates when the discrepancy is greater than 7 days in the first trimester and 10 days in the second trimester

ACOG/AAP: Guidelines for Perinatal Care, 7th Ed. 2011 (in press)
What about “late to care” patients?

- Late to Care (after 20 weeks):
  - And dated only by Ultrasound after 20 wks
  - Recommend FLM before scheduled elective procedure
  - For repeat CS in uncomplicated pregnancy would need to have discussion of risks/benefits

- In one prior low transverse CS patients, little harm to await labor before the CS…
Implementation Discussion
FAQ’s / Common Barriers

- Physician Autonomy— “I’m a Board Certified OB/GYN, I can do what I want”…
- Scheduling problems— “I have to get it done at 39+0 and all the slots are filled”
- Patient preference— “But she really wants me to deliver her and I will be away…”
- What difference does a day or two make? (i.e., is 38+6 really bad?)
- Need to have rules for EDC, (what to do with multiple US EDCs, when to adjust, etc)
Physician “Autonomy” in OB

- Protocols and strong guidelines are used extensively in Internal Medicine and Surgery
  - Door-to-cath times, use of ASA and B-blockers
  - Pre-operative antibiotics and VTE prevention
  - Stroke: very strict protocols
  - Publicly reported, payment-based standards
- OB has been “below the radar” because this movement has been driven by Medicare (which does not pay for OB)—but now it has taken up by commercial insurers and Medicaid
- MediCal will adopt OB Quality Measures this year
Implementation Discussion
FAQ’s / Common Barriers

- Physician Autonomy— “I’m a Board Certified OB/GYN, I can do what I want”…
- Scheduling problems— “I have to get it done at 39+0 and all the slots are filled”
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- What difference does a day or two make? (i.e., is 38+6 really bad?)
- Need to have rules for EDC, (what to do with multiple US EDCs, when to adjust, etc)
What about 38 weeks + 4 to 6 days?

- Tita (NEJM 2009;360:111) (MFM Network)
  - Examined 2,463 scheduled CS babies in this age range
  - Respiratory outcomes worse than 39 weeks (RR=1.21, 95% CI 1.04-1.4, p=0.01), similar to 38 weeks as a whole

- Wilminik (AJOG 2010;202:250.e1-8) (Netherlands)
  - Examined 5,046 scheduled CS babies in this age range
  - Respiratory outcomes worse than 39 weeks (RR=1.4, 95% CI 1.1-1.8, p=0.01), similar to 38 weeks as a whole
Physician Autonomy— “I’m a Board Certified OB/GYN, I can do what I want”…

Scheduling problems— “I have to get it done at 39+0 and all the slots are filled”

Patient preference— “But she really wants me to deliver her and I will be away…”

What difference does a day or two make? (i.e., is 38+6 really bad?)

Why not do an amniocentesis for lung maturity studies?
## Fetal lung maturity testing before 39 weeks and neonatal outcomes

<table>
<thead>
<tr>
<th>Adverse neonatal outcome</th>
<th>&lt;39 weeks + FLM</th>
<th>39-40 weeks</th>
<th>Unadjusted RR (95% CI)</th>
<th>Adjusted† RR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composite adverse outcome</td>
<td>5.9</td>
<td>2.5</td>
<td>2.4 (1.6, 3.5)</td>
<td>1.6 (1.02, 2.6)</td>
</tr>
<tr>
<td>Composite adverse outcome II*</td>
<td>5.0</td>
<td>2.0</td>
<td>2.5 (1.6, 3.8)</td>
<td>1.7 (1.01, 2.7)</td>
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<tr>
<td>Suspected or proven sepsis</td>
<td>5.7</td>
<td>2.2</td>
<td>2.6 (1.7, 3.8)</td>
<td>1.7 (1.1, 2.8)</td>
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<tr>
<td>Respiratory support</td>
<td>2.9</td>
<td>1.0</td>
<td>2.8 (1.6, 5.0)</td>
<td>1.8 (0.96, 3.5)</td>
</tr>
<tr>
<td>RDS</td>
<td>1.4</td>
<td>0.04</td>
<td>35.0 (11, 114)</td>
<td>7.9 (2.0, 31)</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>2.0</td>
<td>0.14</td>
<td>15.0 (7.0, 32)</td>
<td>6.7 (2.5, 17.6)</td>
</tr>
<tr>
<td>NICU admission</td>
<td>5.9</td>
<td>2.3</td>
<td>2.5 (1.7, 3.7)</td>
<td>1.7 (1.05, 2.7)</td>
</tr>
<tr>
<td>Hospitalization &gt;4 days</td>
<td>10.8</td>
<td>3.3</td>
<td>3.3 (2.4, 4.4)</td>
<td>2.6 (1.8, 3.9)</td>
</tr>
</tbody>
</table>

*Excludes suspected sepsis; †Adjusted for maternal age, race, parity, medical complications (hypertensive disorder or diabetes) and baby gender.

**Conclusion:** Gestational age and Fetal Lung Maturity (FLM) tests are related but independent predictors of fetal maturity.
Elective delivery with known fetal lung maturity prior to 39 wks is still associated with increased neonatal morbidity

<table>
<thead>
<tr>
<th>Neonatal Outcome</th>
<th>Mature Amnio (36+0 to 38+6)</th>
<th>Control (Inductions &gt;39)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>1,081</td>
<td>9,068</td>
<td></td>
</tr>
<tr>
<td>NICU Admit (%)</td>
<td>9.6</td>
<td>3.2</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>NICU LOS-days</td>
<td>4.24</td>
<td>4.26</td>
<td>NS</td>
</tr>
<tr>
<td>Total Resp Morbidity (%)</td>
<td>7.3</td>
<td>1.6</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>RDS (%)</td>
<td>0.7</td>
<td>0.02</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>TTN (%)</td>
<td>4.3</td>
<td>1.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Other Resp Morbidity (%)</td>
<td>3.0</td>
<td>0.6</td>
<td>0.5</td>
</tr>
<tr>
<td>Ventilator (%)</td>
<td>1.1</td>
<td>0.3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Sepsis (%)</td>
<td>0.2</td>
<td>0.02</td>
<td>NS</td>
</tr>
<tr>
<td>Hypoglycemia (%)</td>
<td>2.3</td>
<td>0.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Neonatal Deaths (%)</td>
<td>0</td>
<td>0.01</td>
<td>NS</td>
</tr>
</tbody>
</table>
What about FLM for Elective Delivery <39wks?

- Summary of recent studies:
  - Show serious morbidity with babies born before 39 weeks even with “mature” FLM studies
  - This should not be a surprise as much of the near-term morbidity is not related to surfactant deficiency

**ACOG:** “A mature fetal maturity test result before 39 weeks of gestation, in the absence of appropriate clinical circumstances is not an indication for delivery.”

KMC Before “Hard Stop” Implementation

Elective Births <39 Weeks Gestational Age

Q1 2010 | Q2 2010 | Q3 2010 | Q4 2010 | Q1 2011
---|---|---|---|---
KMC Rate | Statewide Rate | Regional Rate
KMC Post “Hard Stop” Implementation

# of elective deliveries at <39 weeks gestational age

Kern Medical Center

Statewide Rate

Regional Rate
Summary: Reasons to Eliminate Non-Medically Indicated (Elective) Deliveries Before 39 Weeks

- Reduction of neonatal complications
- No harm to mother if no medical or obstetrical indication for delivery
- Strong support from ACOG
- Now a national quality measure for hospital performance:
  - National Quality Forum (NQF)
  - Leapfrog Group
  - The Joint Commission (TJC)