The Challenge

- The national standard for performance of unscheduled cesarean delivery is 30 minutes from the time of decision for cesarean delivery to the time of the incision (AAP & ACOG Guidelines for Perinatal Care, 2007)
- Delay in performing cesarean delivery may lead to neonatal compromise and significantly increases hospital and healthcare team liability

The Evidence

- Limited evidence to support the 30 minute decision to incision standard
- Published reports suggest approximately 60% of emergency cesarean deliveries accomplished within 30 minutes
- Delivery within 30 minutes does not guarantee against adverse outcome
- Most infants delivered for emergency indications are not compromised with greater than 30 minute decision to incision interval
- Indeterminate fetal heart rate tracings are nonspecific; high false-positive rate
Urgent Delivery for Fetal Bradycardia  
Leung, et al, 2009

- Retrospective review of 235 cases of CS for fetal bradycardia
- 3 Groups
  - Irreversible Cause (39)
    - Abruptio, cord prolapse, uterine rupture, preeclampsia, failed instrumentation
  - Potentially Reversible (22)
    - Iatrogenic uterine hyperstimulation, hypotension after epidural, after external breech version (without abruption), aortocaval compression
  - Unknown Cause (174)

Irreversible Group

- Significantly lower median cord arterial pH
- Number of infants with arterial pH less than 7 significantly higher
- Median decision-to-delivery interval 1-1.5 minutes shorter
- Median bradycardia-to-delivery interval 5 - 5.5 minutes shorter

Implications

- When underlying cause of fetal bradycardia was irreversible, cord arterial pH deteriorates rapidly starting from the onset of the bradycardia (26.8% chance of pH less than 7)
- When cause was potentially reversible or unknown, there was not significant relationship between cord arterial pH and delivery interval (4-5% chance of pH less than 7)
- Irreversible conditions require prompt delivery
- CS may be avoided in potentially reversible conditions with corrective management
G 4 P2 at 34 5/7 weeks gestation following MVA. The car she was driving was hit at high speed on right side while she was attempting to make left turn.

C/O severe abdominal pain; seat belt pattern bruising noted, no vaginal bleeding. Bedside ultrasound confirmed cephalic presentation, anterior placenta, no retro placental clot visualized.

Outcome
- Decision-to-incision time = 10 minutes
- Decision-to-delivery time = 13 minutes
- Apgar 0 – 3 – 7
- Cord Gasses:
  - Arterial pH 7.06, pCO2 68, BE -12
  - Venous pH 7.14, pCO2 53, BE -11
- 40 - 50 % abruption
- Fetal-maternal hemorrhage (Kleihauer-Betke 2.9%)
- Infant self extubated shortly after birth, transfused, nasal cpap X 2 days, DC home on day 9

G 1 P 0 at 37 3/7 Weeks
Induction for Mild Preeclampsia and Decreased Fetal Movement

FHR Tracing Over Past Hour Has Moderate to Minimal Variability, No Accelerations and Intermittent Late Decelerations

Vaginal Exam at 0800  9/100%/+1
Decision for CS 0810; Move to OR 0815; Incision 0822; Delivery 0824

Decision-to-incision = 12 minutes
Decision-to-delivery = 14 minutes
Female Infant, 2330 grams

Outcome
- Apgars 1 – 6 – 7
- Cord arterial pH 7.03, pCO2 92, BE -9.8
- Short cord
- Placenta 10%ile for gestational age
- Infant initially admitted to NICU and quickly transferred to Normal Nursery
- Normal Newborn Course

The Situation
- Randomized trial can not be done
- Most emergent deliveries develop during labor in low-risk women
- Interdisciplinary effort required for timely delivery
- Meeting the 30 minute standard:
  - Improves outcome for some infants
  - Protects healthcare team
Baseline Performance

- Retrospective review of 36 cesarean deliveries performed for fetal indications
- Cases meeting 30 minute standard = 25%
- Mean decision to incision minutes = 39
- Range = 10-90 minutes

Initial Plan

- Prospective data collection
- Audit completed by primary nurse for each unscheduled cesarean delivery
- Nurse and physician education regarding 30 minute standard
- Review of reasons for delays

Reasons for Delay

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Initiation of Anesthesia</td>
<td>17%</td>
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<tr>
<td>Unknown</td>
<td>16%</td>
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<tr>
<td>OB Nurse not avail</td>
<td>12%</td>
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<tr>
<td>OR not avail</td>
<td>11%</td>
</tr>
<tr>
<td>Waiting for Assistant</td>
<td>7%</td>
</tr>
<tr>
<td>OB not in hosp</td>
<td>7%</td>
</tr>
<tr>
<td>OB in other case</td>
<td>7%</td>
</tr>
<tr>
<td>Anes not avail</td>
<td>6%</td>
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<tr>
<td>Labs/Blood</td>
<td>6%</td>
</tr>
<tr>
<td>Communication</td>
<td>4%</td>
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</tbody>
</table>

Decision to Incision Time Range 31-211 Minutes
Number of Patients = 94
Reasons for Delay
Fetal Indications

- 26%
- 18%
- 14%
- 14%
- 9%
- 9%
- 5%
- 5%

Initiation of Anesthesia
Unknown
OB Nurse not avail
OR not avail
Waiting for Assistant
OB not in hosp
OB in other case
Anes not available

Decision to Incision Time Range 31-76 Minutes
Number of Patients = 17

Work Flow

- Identify available resources
  - Physical capacity
  - Personnel

- Describe current process
  - Roles
  - Processes

Resources

- Physical Capacity
  - 1 designated OR and 1 back-up OR
  - Reluctance to use second OR

- Personnel
  - 1 designated anesthesiologist, and 1 back-up on call, 1 resident (sporadically)
  - 2 in-house OB physicians (1 MFM, 1 OB resident)
  - 1 designated scrub tech, back-up provided by OR Coordinator or on-call person
  - Circulator from L&D staff
**Resources**

- Roles
  - Duplication of effort
  - Unclear direction
- Processes
  - Unnecessary information
  - Inconsistent preparations
  - Repeated calls to OR and physicians

**Work Flow Agreements**

- Standardized roles
- Anesthesia resident on all shifts
- Open second OR without hesitation
- Move to OR within 10-15 minutes
- Foley and compression sleeves stocked and applied in OR
- Decision to proceed without assistant made by surgeon

**Meeting The 30 Minute Standard**

*Fetal Indications*

- Percent of Cases with Decision to Incision Time 30 Minutes or Less
**New Approach 2010**

- Tracking move to OR time
- Monthly posting of all cases with nurse and physician names of cases meeting standard
- Individual notification of team members with cases not meeting standard
- Posting of circumstances when standard not met
- Analysis of opportunities for improvement

**Shared goal……**

**Decision to Incision ≤ 30 minutes**

**Code Green**

- Simultaneously alerts everyone in unit
- Secretary immediately pages anesthesia
- Coordinator immediately aware
- Available staff assist
Opportunities Identified

- OB physician remain with patient until transfer to OR
- Immediate opening of second OR
- Code Green
- Begin transfer to OR within 5 minutes
- Deliberate communication
  - “Is there a fetal indication?”
  - Verbally establish timeline

Meeting The 30 Minute Standard
Fetal Indications 2010

Keys to Success

- Dedicated PI Team with MD Champion
- Standardize process
- Frequent review of performance
- Modification of process based on performance
- Continual reinforcement of process
- Posting progress
- Individual accountability