The IHI Perinatal Bundles

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February 2011
Elective Induction Bundle

• Assessment of gestational age (ensuring that gestational age is greater than or equal to 39 weeks)
• Monitoring for normal fetal heart rate
• Pelvic assessment
• Monitoring and management of tachysystole
Augmentation Bundle:

- Documentation of Estimated Fetal Weight
- Monitoring for normal fetal heart rate
- Pelvic assessment
- Monitoring and management of tachysystole
Bundle Science

• A "bundle" is a group of interventions related to a disease process that, when executed together, result in better outcomes than when implemented individually.
VAP Bundle

Ventilator Associated Pneumonia Bundle Elements
1. Elevation of the Head of the Bed
2. Daily "Sedation Vacations" and Assessment of Readiness to Extubate
3. Peptic Ulcer Disease Prophylaxis
4. Deep Venous Thrombosis Prophylaxis
VAP Bundle

- Success: State of Michigan eliminated VAP over one specific time period
Why create perinatal bundles?
Perinatal Community

Birth Trauma

• Can we reduce birth trauma?
  – Estimated that about 50% is preventable
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*Birth Trauma*

- **Causation**
  - Large fetuses
  - Operative vaginal deliveries (esp midpelvic & combined)
  - Vaginal breech delivery
  - Inappropriate use of pitocin
  - Abnormal/excessive traction
  - Inadequate assessment of fetal status
Another View of Obstetric Problems

- Inability to recognize a/o respond to antepartum and intrapartum “fetal distress”
- Inability to effect a timely delivery by cesarean section
- Inability to resuscitate a depressed infant
- Inappropriate use of oxytocin
- Inappropriate use of forceps/vacuum

(Garite, Knox and Simpson, 1993)
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Birth Trauma

• Prevention
  – Don’t deliver large fetuses
  – Don’t do Operative vaginal deliveries
  – Don’t do Vaginal breech delivery
  – Don’t use pitocin
  – Don’t pull too hard
  – Interpret fetal status perfectly
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Birth Trauma

• Prevention
  – Practice Dermatology
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*Birth Trauma and Pitocin*

- **Prevention of Pitocin Related Trauma**
  - Identify large babies
  - Don’t do midpelvic deliveries when macrosomia is suspected
  - Limit vaginal breech delivery
  - Identify and respond to tachysystole
  - Avoid abnormal/excessive traction
  - Interpret fetal monitor perfectly so everyone will agree with the interpretation
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Birth Trauma and Pitocin

• **Causation**
  
  – Large fetuses
  – Operative vaginal deliveries (esp midpelvic & combined)
  – Vaginal breech delivery
  – Inappropriate use of pitocin (tachysystole)
  – Abnormal/excessive traction
  – Inadequate assessment of fetal status
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Pitocin Use

• **Know everything (clinical) about the drug**
  – Indications
  – Contraindications
    • Vasa previa or complete placenta previa
    • Transverse fetal lie
    • Umbilical cord prolapse
    • Previous transfundal uterine surgery
    • Nonreassuring fetal assessment
    • Absolute cephalopelvic disproportion
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_Pitocin Use_

– _Not Contraindications but require special attention_
  • One or more previous low-transverse cesarean deliveries
  • Breech presentation
  • Maternal heart disease
  • Multifetal pregnancy
  • Polyhydramnios
  • Presenting part above the pelvic inlet
  • Severe hypertension
  • Abnormal fetal heart rate patterns not necessitating emergent delivery
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Pitocin Use

- **Requirements for elective labor induction**
  - Assessment of gestational age
  - Monitoring fetal heart rate for reassurance
  - Monitoring uterine contractions for tachysystole
  - Pelvic assessment
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Elective Labor Induction-Requirements

– **Assessment of gestational age**
  - Confirmation of Term Gestation
  - Iatrogenic prematurity is unacceptable and indefensible
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Elective Labor Induction - Requirements

- **Confirmation of Term Gestation**
  - Fetal heart tones have been documented for 20 weeks by nonelectronic fetoscope or for 30 weeks by Doppler.
  - It has been 36 weeks since a positive serum or urine human chorionic gonadotropin pregnancy test was performed by a reliable laboratory.
  - An ultrasound measurement of the crown–rump length, obtained at 6-12 weeks, supports a gestational age of at least 39 weeks.
  - An ultrasound obtained at 13-20 weeks confirms the gestational age of at least 39 weeks determined by clinical history and physical examination.
  - Amniocentesis and documentation of fetal maturity
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Elective Labor Induction - Requirements

- **Requirements for elective labor induction**
  - Assessment of gestational age
  - Monitoring fetal heart rate for reassurance
  - Monitoring uterine contractions for hyperstimulation
  - Pelvic assessment
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Elective Labor Induction - Requirements

- Monitoring fetal heart rate for reassurance
  • Reassuring Fetal Status – use a common language (NICHD)
  • Personnel familiar with the effects of uterine stimulants on the fetus
  • Physician capable of performing a cesarean delivery should be readily available and responds when asked
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*Elective Labor Induction—Requirements*

- **Requirements for elective labor induction**
  - Assessment of gestational age
  - Monitoring fetal heart rate for reassurance
  - Monitoring uterine contractions for tachysystole
  - Pelvic assessment
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Elective Labor Induction - Requirements

- **What is Tachysystole**
  - > 5 contractions in 10 minutes, averaged over a 30” window
  - Contractions persistently lasting greater than 2 minutes
  - < 60 seconds baseline tone between contractions
  - Hypercontractility associated with fetal compromise not necessary
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Elective Labor Induction - Requirements

- Monitoring uterine contractions for tachysystole
  - Personnel familiar with the effects of uterine stimulants
  - Monitoring fetal heart rate and uterine contractions is recommended as for any high-risk patient in active labor
    - EFM or Intermittent auscultation
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Elective Labor Induction—Requirements

- **Requirements for elective labor induction**
  - Assessment of gestational age
  - Monitoring fetal heart rate for reassurance
  - Monitoring uterine contractions for tachysystole
  - Pelvic assessment
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*Elective Labor Induction-Requirements*

– *Pelvic assessment*
  • Cervical evaluation
    – Bishop’s Score
  • Fetal presentation and size
  • Clinical Pelvimetry
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Augmentation - Requirements

- **Augmentation Bundle**
  - Estimated fetal weight
  - Normal fetal status
  - Absence of tachysystole with increases of pitocin
  - Pelvic Assessment
Success Stories

Initiated bundles and other processes at three sites.
Results: reduced birth trauma from a mean of .20% to .03%
Success Stories

Intermountain Health Care System
Aim to reduce elective inductions before 39 weeks.

Outcomes:
1. reduced elective inductions before 39 weeks from 28% to 3%.
2. Reduced average maternal length of stay
3. Variable cost savings of $1.4 million over five years
IHI
Vacuum Delivery Bundle
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Birth Trauma related to Vacuum Delivery

• What we cause
  – Scalp laceration
  – Retinal hemorrhage
  – Cephalohematoma
  – Subgaleal hemorrhage
  – Intracranial hemorrhage
  – Hyperbilirubinemia
  – Maternal trauma
• Conclusion
  – Serious complication of Vacuum device in approximately 5% of vacuum attempts
  – Patients need to be aware of these risks

“Given the maternal and fetal risks associated with operative vaginal delivery, it is important that the patient be made aware of the potential complications of the proposed procedure”

## Effect of Delivery on Neonatal Injury

<table>
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<tr>
<th>Method</th>
<th>Death</th>
<th>ICH</th>
<th>Other*</th>
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<tbody>
<tr>
<td>SVD</td>
<td>1/5,000</td>
<td>1/1,900</td>
<td>1/216</td>
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<tr>
<td>C/S labor</td>
<td>1/1,250</td>
<td>1/952</td>
<td>1/71</td>
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<tr>
<td>C/S after OVD</td>
<td>1/333</td>
<td>1/38</td>
<td></td>
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<tr>
<td>C/S no labor</td>
<td>1/1,250</td>
<td>1/2,040</td>
<td>1/105</td>
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<tr>
<td>VD alone</td>
<td>1/3,333</td>
<td>1/860</td>
<td>1/122</td>
</tr>
<tr>
<td>Forceps alone</td>
<td>1/2,000</td>
<td>1/664</td>
<td>1/76</td>
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<tr>
<td>Vacuum and forceps</td>
<td>1/1,666</td>
<td>1/280</td>
<td>1/58</td>
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</tbody>
</table>

*Facial nerve/brachial plexus injury, convulsions, central nervous system depression, mechanical ventilation

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Birth Trauma related to Vacuum Delivery

• **How we cause it**
  – Unnecessary procedure
  – High risk procedure
  – Inadequate skill of provider
  – Unknown fetal parameters
  – Prolonged application or multiple pop-offs
  – No alternative delivery options available
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*Preventing Trauma with Vacuum Delivery*

• Preliminary considerations
  – Consider alternative management
  – High chance of success
  – Exit strategy prepared
  – Prepared patient
    • Informed consent
  – Resuscitation team available
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Preventing Trauma with Vacuum Delivery

- **Technical considerations**
  - Fetal parameters known and considered
    - EFW, Station, Position
  - Application time and pop-offs limited
  - Torque in direct line of birth canal
    - No rocking movements
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Preventing Trauma with Vacuum Delivery

• **Bundle Components**
  – Individual components supported by science
  – Required to be performed for every patient, every time
  – Bundle compliance measured by fulfilling all parts of the bundle
  – Focus on system
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Preventing Trauma with Vacuum Delivery

• **Vacuum Bundle**
  – Alternative labor strategies considered
  – Prepared patient
    • Informed consent discussed and documented
  – High probability of success
    • EFW, fetal position and station known
  – Maximum application time and number of pop-offs predetermined
  – Exit strategy available
    • Cesarean and resuscitation team available
The End