Improving the Reporting Accuracy: Antenatal Corticosteroid Use

March 28th, 2019

Partnering to Improve Health Care Quality for Mothers and Babies
Agenda

• What is the Data Showing?
• Most Improved Hospitals
• Importance of Antenatal Steroids
• Improving Hospital Reporting
• Clinical Scenarios
• Upcoming Webinar
• Adjourn
What is the Data Showing?

Chinyere N. Reid, MBBS, MPH
BCI – Project Manager
FPQC
Average Percent Accuracy of All 23 Birth Certificate Variables – BCI Initiative-Wide

Goal of 95%

Accuracy

70% 75% 80% 85% 90% 95% 100%

June'18  Jul'18  Aug'18  Sep'18  Oct'18  Nov'18  Dec'18  Jan'19  Feb'19

92% 92% 92% 94% 93% 94% 93% 94%
Average Percent Accuracy for BCI Hospitals

Least Accurate Variables - February

Goal of 95%

Accuracy

50% 60% 70% 80% 90% 100%

Baseline Aug Sep Oct Nov Dec Jan Feb

First Prenatal Visit
Number of Prenatal Visit
Prepregnancy Weight
Antibiotics

Least Accurate Variables

Baseline Aug Sep Oct Nov Dec Jan Feb
68% 71% 77% 84% 86% 84% 81% 76% 78% 92% 87% 85%

Goal of 95%
Average Percent Accuracy of All 17 BCI Hospitals from Baseline

Goal of 95%
Average Percent Accuracy of All 17 BCI Hospitals from Baseline

Accuracy

Baseline  February

Goal of 95%
Most Improved Overall
Baseline to February

Holmes Regional Medical Center
Jupiter Medical Center
Mount Sinai Medical Center
Tampa General Hospital
Average Percent Accuracy of All 17 BCI Hospitals for Antenatal Corticosteroids

Accuracy

Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb

92% | 92% | 91% | 94% | 91% | 93% | 95% | 95% | 95%

Goal of 95%
Percentage of Antenatal Corticosteroid Use Among Infants Born at 24-31 Weeks of Gestation, 2009-2018

For All **Level III** NICU Hospitals in Florida

![Graph showing percentage of antenatal corticosteroid use for Level III NICUs.]

For All **Level I and II** NICU Hospitals in Florida

![Graph showing percentage of antenatal corticosteroid use for Level I and II NICUs.]

- **Max. Value**
- **75th Percentile**
- **State Median**
- **25th Percentile**
- **Min. Value**

**Percentage of Antenatal Corticosteroid Use Among Infants Born at 24-31 Weeks of Gestation, 2009-2018**
Percentage of Antenatal Corticosteroid Use Among Infants Born at 24-31 Weeks of Gestation, 2009-2018

For All Level III NICU Hospitals in Florida

For All Level I and II NICU Hospitals in Florida

Likely Real Level?

Statewide Percent

Year
Percentage of Antenatal Corticosteroid Use Among Infants Born at 24-31 Weeks of Gestation, 2009-2018

For All **Level III** NICU Hospitals in Florida

- Year
- Percentage of Antenatal Corticosteroid Use
- Statewide Percent

For All **Level I and II** NICU Hospitals in Florida

- Year
- Percentage of Antenatal Corticosteroid Use
- Statewide Percent

Likely Real Level?
Importance of Antenatal Steroids

Karen Bruder, MD, FACOG
Associate Professor
Department of OB/GYN
USF Morsani College of Medicine

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Antenatal Corticosteroid Treatment (ACT) Timeline

1969: Liggins demonstrates ACT induced FLM in lambs

1972: Liggins landmark paper demonstrates reduced severity of RDS and mortality if ACT given before preterm birth

1976 – 1993: Over a dozen RCTs worldwide demonstrate reduced mortality, RDS, and need for respiratory support in preterm infants born to mothers who received ACT versus placebo

1995: National Institutes of Health Consensus statement

1990s – 2012: Beneficial effects of ACT in reducing neonatal morbidity recognized

1970s 1980s 1990s 2000s 2010s
Women who are at Risk for Preterm Delivery: Candidates for ACT

- ACT should be immediately administered when delivery is anticipated within 7 days of diagnosis

<table>
<thead>
<tr>
<th>Condition*</th>
<th>Contraindications</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTL</td>
<td>Allergy to betamethasone or dexamethasone</td>
</tr>
<tr>
<td>PPROM</td>
<td>Systemic infection</td>
</tr>
<tr>
<td>Non-reassuring FHR</td>
<td>Patients have already received a course of ACT</td>
</tr>
<tr>
<td>Vaginal bleeding</td>
<td></td>
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<tr>
<td>Hydrops</td>
<td></td>
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<tr>
<td>IUGR</td>
<td></td>
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<tr>
<td>Preeclampsia</td>
<td></td>
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<tr>
<td>Eclampsia</td>
<td></td>
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</tbody>
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*Not an all inclusive list: includes any other condition in which delivery is anticipated within 7 days
Assessing Imminent Delivery

Causes of Preterm Delivery

- Spontaneous Preterm Labor 40-45%
- Preterm Premature Rupture of Membranes (PPROM) 30-35%
- Indicated 30-35%

## Dosage: The Tale of Two Drugs

<table>
<thead>
<tr>
<th>Betamethasone</th>
<th>Dexamethasone</th>
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</thead>
<tbody>
<tr>
<td>Intramuscular</td>
<td>Intramuscular</td>
</tr>
<tr>
<td>Two doses</td>
<td>Four doses</td>
</tr>
<tr>
<td>12 mg</td>
<td>6mg</td>
</tr>
<tr>
<td>24 hours apart</td>
<td>12 hours apart</td>
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</tbody>
</table>

*Additional research is still needed to establish which antenatal steroid drug and dosage regimens are most effective*
Proven Benefits of ACT between 24 & 34 Weeks

<table>
<thead>
<tr>
<th>Antenatal corticosteroids led to reduction in:</th>
<th>~</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonatal death (NND)</td>
<td>~ 30%</td>
</tr>
<tr>
<td>Respiratory distress syndrome (RDS)</td>
<td>~ 35%</td>
</tr>
<tr>
<td>Intraventricular hemorrhage (IVH)</td>
<td>~ 50%</td>
</tr>
<tr>
<td>Cerebroventricular hemorrhage</td>
<td>~ 50%</td>
</tr>
<tr>
<td>Necrotizing enterocolitis (NEC)</td>
<td>~ 55%</td>
</tr>
<tr>
<td>NICU admissions</td>
<td>~ 20%</td>
</tr>
<tr>
<td>Early systemic infections</td>
<td>~ 50%</td>
</tr>
</tbody>
</table>

Roberts D, Dalziel S. Cochrane Database of Systematic Reviews 2006; Issue 3
Major Morbidity Reduced by ACT
Pulmonary

Respiratory Distress Syndrome (RDS)

- **How does this happen:** Insufficient surfactant production + decreased ability of the lungs to expand and absorb oxygen $\rightarrow$ hypoxemia (decreased oxygen in the blood)

- **Incidence:** Increases with decreasing gestational age (93% < 28 weeks, 10.5% at 34 weeks)

- **Prevention:** Mother – ACT (prior to delivery), Baby – Surfactant, CPAP (after delivery)

- **Treatment:** Placement of arterial catheters, supplemental oxygen, positive pressure ventilation, chest tubes, and the use of endotracheal tubes

- **Short Term:** Hypoxemia, Pneumothorax (air in the chest that prevents lung expansion)

- **Long Term Underdevelopment of the Lungs:** Bronchopulmonary dysplasia (BPD) $\rightarrow$ increased death rate, poorer neurodevelopmental outcomes such as cerebral palsy and learning delays
Pulmonary

Respiratory Distress Syndrome (RDS)

- RDS creates hypoxemia (decreased oxygen in blood)
- Most other major problems and death in premature infants are related to hypoxemia
Gastrointestinal

**Necrotizing Enterocolitis (NEC)**

- **How does this happen:** Decreased oxygen supply and inflammation of the fragile intestines (usually terminal ileum and colon), death of intestinal tissue and perforation (hole in the intestines which allows stool and bacteria into the abdomen)
- **Incidence:** 2–10% of VLBW infants (<1500gms)
- **Treatment:** Antibiotics, TPN, laparotomy, removal of affected intestines
- **Short Term:** Sepsis (infection of the blood), DIC, increase in neonatal death
- **Long Term:** Growth and neurodevelopmental delays (such as cerebral palsy and learning disabilities), persistent diarrhea and frequent bowel movements
Cerebral/Neurodevelopmental

**Intraventricular Hemorrhage (IVH)**

- **How does this happen:** Fragile brain tissue + hypoxemia and disturbances of cerebral blood flow → capillary bleeding into brain tissue and intraventricular spaces.
- **Incidence:** Increased with decreasing gestational age – 36% between 22 and 28 weeks, 3.3-6.3% from 30-34 weeks
- **Long Term:** Hydrocephalus (water on the brain), hemorrhagic infarction (stroke), and hardening of the brain tissue, cerebral palsy, learning delays, visual or hearing problems

“The most beneficial intervention for patients in true preterm labor is the administration of corticosteroids.”
A single course of corticosteroids is recommended between 24 weeks and 34 weeks gestation when risk of preterm delivery is within 7 days.

- Betamethasone: Two doses of 12mg IM, 24 hours apart OR
- Dexamethasone: Four doses of 6mg IM, 12 hours apart

A single course of repeat antenatal corticosteroids should be considered in women whose prior course of ACT was administered at least 7 days previously and who remain at risk of preterm delivery before 34 weeks gestation, irrespective of the fetal number.

These recommendations are also outlined in NICHD Consensus Statement published in 1994 and the NIH Consensus Statement published in 2000.
Questions?
Comments?
Improving Hospital Reporting

Annette Phelps, ARNP, MSN
FPQC Nurse Consultant

Partnering to Improve Health Care Quality for Mothers and Babies
Antenatal Corticosteroid Treatment (ACT)

- Joint Commission QI measure: PC-03
- Important to standardize documentation to be compliant
- Definition:
  - Documentation that antenatal steroids (ANS) was initiated before delivery (for fetal lung maturation).
  - Includes documentation of administration in another facility or current hospitalization.
  - Patients delivering preterm at 24 to <34 weeks gestation receiving ANS prior to delivery.
- Agents: Betamethasone 12 mg or Dexamethasone 6mg
- Improvement Noted As: Increase in the rate
- Mandatory reporting:
  - Began first quarter of 2014 and due in June 2014.
  - Added preterm infants up to 33 6/7 weeks gestation beginning January 2015.
Hospital policy is a **key driver** to improving ACT reporting

**Intervention:**
- Establish system to remind/flag patient not receiving ACT or when course is completed
- Standardize documentation of ACT in hospital chart and/or EMR
- Communicate and document ACT at maternal transport
- Teach coders/birth registry staff your ACT terminology and documentation system
Information Sources for ACT

1st Delivery record
   - Maternal OB/labor or delivery summary record

2nd Maternal medication record

3rd Newborn admission H&P

4th Maternal physician order sheet

5th Prenatal care records
Other Potential Sources for ACT Info

- Physician and nursing maternal admission history
- Transfer notes from referring hospital
- Prior hospitalization discharge summary notes
- ACT Passport
Standardizing Clinical Practice

- Standardize where ACT is found in:
  - Prior admissions
  - Given at referring hospital
  - Given at doctor’s office

- For example, use of an ACT Implementation Checklist
ACT Implementation Checklist

- Standardized protocol for assessing imminent preterm delivery within 7 days
- Hospital procedures to standardize ACT
- Hospital policy to memorialize ACT*
- Standardized order sets*
- Availability of ACT on Labor and Delivery 24/7
- Maternal transport documentation forms*
- Documentation of ACT administration, including patients discharged undelivered
- Physician education
- Staff education
- Patient education

*Sample forms can be found at www.prematurityprevention.org
Improving ACT Documentation

- Teach birth registry staff ACT terminology and where to look for the data
- Antenatal Corticosteroids referred to differently in many ways
- For example, American Congress of Obstetricians and Gynecologists (ACOG) refers to ACT in three different ways
  - Antenatal Corticosteroids
  - Antenatal Steroids
  - Corticosteroids
Improving ACT Documentation

- Additional terminology and acronyms for ACT include:
  - ACS
  - ANCS
  - ACT
  - ANS
  - Betamethasone
  - Betamethasone phosphate
  - Beta-PO4
  - Betamethasone acetate
  - Beta-Ac
  - Dexamethasone
  - Glucocorticoids
  - Steroids

- Audit medical records to understand compliance
Clinical Scenarios

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So how does this relate to collecting birth certificate data?
Flowchart For Birth Registry Staff

- Gestational Age ≥ 37 weeks
- Gestational Age 23 – 36 weeks
- Gestational Age ≤ 22 weeks
Flowchart For Birth Registry Staff

- **Gestational Age ≥ 37 weeks**
- **Gestational Age 23 – 36 weeks**
- **Gestational Age ≤ 22 weeks**

1. **YES**
   - Was ACT given during hospitalization?
   - **YES**
     - Document in birth registry
   - **NOT**
     - Not an ACT candidate
Flowchart For Birth Registry Staff

1. **Gestational Age ≥ 37 weeks**
   - Was ACT given to the mother before transport to your facility? **YES**

2. **Gestational Age 23 – 36 weeks**
   - Was the mother transferred from another facility? **YES**

3. **Gestational Age ≤ 22 weeks**
   - Was ACT given during hospitalization? **YES**

   - Document in birth registry

   - Not an ACT candidate

   - Document in birth registry

   - Document in birth registry
Flowchart For Birth Registry Staff

Gestational Age ≥ 37 weeks

- WAS the mother transferred from another facility?
  - YES
  - NO

- WAS ACT given to the mother before transport to your facility?
  - YES
  - NO

- Document in birth registry

Gestational Age 23 – 36 weeks

- WAS ACT given during hospitalization?
  - YES
  - NO

- Document in birth registry

Gestational Age ≤ 22 weeks

- Not an ACT candidate

Did mother have previous admissions to any hospital during this pregnancy?

- YES
  - NO

- Document in birth registry

During previous admissions, was the gestational age 23 – 36 weeks?

- YES
  - NO

- Identify if ACT was given in prior hospitalization and document in birth registry

Was the diagnosis Premature Labor or Premature Rupture of Membranes or did the mother receive tocolytics?

- YES
  - NO

- Not an ACT candidate

Identify if ACT was given in prior hospitalization and document in birth registry
Antenatal Corticosteroids Scenario 1

Mother was hospitalized and kept strict bed rest. She gave birth during this hospitalization. Infant was born at 22 weeks of gestational age.
Flowchart Scenario 1 Pathway

Gestational Age ≤ 22 weeks

YES

Not an ACT candidate
Antenatal Corticosteroids Scenario 2

Infant was born full term with a gestational age of 38 weeks. The mother came directly from home for the delivery. Her records indicate a previous hospitalization during this pregnancy when 30 weeks of gestation was completed. She did not receive antenatal steroids prior to or during the hospital admission.
Flowchart Scenario 2 Pathway

Gestational Age ≥ 37 weeks

- Was the mother transferred from another facility?
  - Yes
  - No

- Did mother have previous admissions to any hospital during this pregnancy?
  - Yes
  - No

- During previous admissions, was the gestational age 23 – 36 weeks?
  - Yes
  - No

  Not an ACT candidate

- Was the diagnosis Premature Labor or Premature Rupture of Membranes or did the mother receive tocolytics?
  - Yes
  - No

Identify if ACT was given in prior hospitalization and document in birth registry
Infant was born with a gestational age of 28 weeks. The mother did not receive ACT at the delivering facility, however you notice the mother was transferred from another medical facility. Upon review, you note she did not receive antenatal steroids during the prior hospitalization.
Flowchart Scenario 3 Pathway

Gestational Age 23 – 36 weeks

Was ACT given during hospitalization?  

Was the mother transferred from another facility?  

Was ACT given to the mother before transport to your facility?  

Document in birth registry
Maternal Transfers – Key ACT Steps

- Communication is key to optimizing ACT when transferring an at risk preterm patient between institutions.
- Steps to help improve ACT during maternal transports include:
  - Documentation of ACT at transferring hospital
  - Duplicate Handoff coming from 2 sources:
    - Doctor-to-Doctor
    - Nurse-to-Nurse
- Standardize ACT documentation at receiving hospital
- Standardize handoff tool
  - Transfer Summary Form for Referring Hospital
  - Physician Transport Intake Form
  - Nursing Transport SBAR
Flowchart Scenario 3 Pathway

**Gestational Age 23 – 36 weeks**

- **Was ACT given during hospitalization?**
  - **YES**
  - **NO**

- **Was the mother transferred from another facility?**
  - **YES**
  - **NO**

- **Was ACT given to the mother before transport to your facility?**
  - **YES**
  - **NO**

- **Did mother have previous admissions to any hospital during this pregnancy?**
  - **YES**
  - **NO**

- **During previous admissions, was the gestational age 23 – 36 weeks?**
  - **YES**
  - **NO**

- **Was the diagnosis Premature Labor or Premature Rupture of Membranes or did the mother receive tocolytics?**
  - **YES**
  - **NO**

- **Identify if ACT was given in prior hospitalization and document in birth registry**

- **Document in birth registry**

- **Not an ACT candidate**
Hospital Grids

- It is important that you refer to your hospital’s flow chart for Antenatal Corticosteroids pathway
- Flow chart should also be used for deliveries at GA < 34 weeks
ACT Administration Red Flags

Check if the mother had any of the following:

- **Transferred** from another facility
- Prior **admissions** during this pregnancy
- Diagnosed with **premature labor** or **premature rupture of membranes** (PROM; PPROM)
- Received medications to suppress premature labor: called **tocolytics** (e.g. terbutaline, nifedipine)
Summary

- Standardize language for antenatal corticosteroids
- Provide hands-on training – records review and searches, skills lab
- Immediate feedback on actual or simulation reviews of records
- Cross train providers in standard language and documentation in the patient record, so that they understand the importance for BC preparation
- Need to look at other sources because mother could have received ACT at:
  - A previous admission
  - A different facility prior to transfer
- If poor reporting of ACT is identified, audit data abstractors and implement additional training
Questions?
Comments?
Upcoming Final Webinar

June 6\textsuperscript{th}, 2019

‘A Photo Finish - Celebrating Your Success’
Thank you!

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