

# Optimizing Antenatal Use of Steroids to Improve Outcomes for Preterm Infants

**A Labor & Delivery Toolkit**

from the Ohio Perinatal Quality Collaborative





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## Executive Summary

Antenatal corticosteroids (ANCS) have been shown to reduce the risk of serious health problems and death among preterm infants. While rates of administration are generally high, evidence suggests that ANCS administration rates can and should be optimized to reach more than 90% of eligible pregnant women as a way to improve outcomes for babies born too soon.

This toolkit was created by the Ohio Perinatal Quality Collaborative (OPQC) to help hospitals and obstetrical providers do just that. OPQC—a coalition of perinatal clinicians, hospitals, and policymakers formed in 2007—recently concluded a quality improvement (QI) project focused on identifying changes in clinical practices and administrative processes to help hospitals optimize their use of ANCS and accurately document their rates of administration. OPQC used the Model for Improvement<sup>1</sup> to test and implement changes and used data from reviews of the medical record and the state birth registry (birth certificate) to document improvement.

OPQC identified several important attributes that are shared by hospitals with high ANCS treatment rates, as well as specific steps or actions that labor and delivery staff and obstetrical providers can take to improve or maintain their own ANCS rates. All of the information gathered—including lessons learned and helpful tools—are included in this toolkit, designed to help hospitals improve outcomes for mothers and their pre-term babies.

## Optimizing ANCS Treatment: Improving Outcomes for Preterm Infants

Premature birth is a leading cause of serious health complications and death among newborns. Giving antenatal corticosteroids to pregnant women who are expected to deliver their babies before 34 weeks gestation is a well-established and widely endorsed standard among obstetricians, perinatologists, and other health professionals who provide perinatal care.<sup>2</sup>

Since researchers Graham Liggins and Ross Howie discovered more than 40 years ago that ANCS helps the lungs of preterm lambs to

**OPQC identified a number of key changes that drive optimal use and accurate documentation of ANCS. These changes fall into the following categories:**

- Establishing an ANCS documentation system;
- Improving identification of mothers who are eligible for ANCS;
- Administering ANCS in a timely and efficient manner, and at the appropriate time; and
- Ensuring that everyone involved is aware of the benefits and risks of ANCS treatment.





mature, ANCS have been used to improve outcomes for preterm infants, who are at high risk for respiratory and other health problems.<sup>3</sup> Specifically, ANCS helps reduce the risk for respiratory distress syndrome, intraventricular hemorrhage, serious bowel disease, and death among preterm babies. ANCS actually has a protective effect on the lungs, brains, and intestinal tracts of preterm infants.

Today, betamethasone and dexamethasone are the most widely studied and used antenatal corticosteroids. The standard, as defined by the American College of Obstetricians and Gynecologists (ACOG) is to give one course of ANCS to women who are likely to deliver viable, preterm infants—most often defined as those between 24 and 33 weeks and 6 days of gestation—within seven days. One course is equal to two doses of betamethasone, injected 24 hours apart, or four doses of dexamethasone, injected 12 hours apart. ANCS is not indicated if delivery is “imminent.”

In addition, in 2011, ACOG stated that a second “rescue” course of ANCS may safely be given to pregnant women who meet three criteria, that they: 1) received a first course more than two weeks earlier; 2) are still less than 33 weeks’ gestation; and 3) are expected to deliver within one week.<sup>2</sup> However, a second course of ANCS should not be given automatically to women who received their

“There are only a few prenatal interventions that are known to decrease infant mortality and life-long morbidity. Timely administration of corticosteroids before preterm birth is at the top of that short list. The OPQC project has shown that close attention to the system used to identify eligible women and assure treatment can improve our use of this life-saving medication.”

- Jay Iams MD, OPQC OB Lead



first course more than two weeks ago and are still pregnant. It is important to note that more than two courses is not recommended due to concerns about the effects of overexposure to steroids on fetal development.

Between 2010 and 2013, OPQC conducted a quality improvement project in 19 hospitals to learn to identify the best ways to achieve and maintain optimal ANCS administration and to help hospitals ensure that their documentation (both in the medical record and in the state birth registry) accurately reflects their rates of ANCS administration. At the start of the project, *documented* ANCS usages rates varied widely across participating hospitals, from a low of 26% to a high of 100%. The wide range in rates and the variations in record keeping made it difficult to accurately determine ANCS use. This led OPQC to design the QI initiative to both optimize ANCS administration and improve documentation in the medical record and the state birth registry.

The subsequent Antenatal Corticosteroid Promotion Project identified the reasons why many hospitals are very successful at achieving optimal ANCS usage rates of 90% and above. The project also identified reasons why some women who should receive ANCS are missed. This toolkit was developed to share this information widely and improve outcomes for pre-term infants.

## Optimizing ANCS Administration

To achieve optimal ANCS administration rates across the state, OPQC worked with teams from 19 large maternity hospitals using proven QI methods to test and implement effective changes designed to optimize rates of ANCS administration and improve the accuracy of documentation. This toolkit shares successful changes used to optimize administration and improve documentation and provides tools to help implement these changes.

**The goal is to “assure that all infants born before 34 weeks’ gestation receive appropriate ANCS treatment to avoid serious health problems.” The key drivers, which are categories that will drive change to make this possible, are:**

- Establishing an ANCS **documentation** system;
- Improving **identification** of eligible mothers;
- **Administering** ANCS in a timely and efficient manner and at the appropriate time; and
- Ensuring that everyone involved is **aware of the benefits and risks** of ANCS treatment.

Implementing changes that target each of these key drivers is what enabled OPQC teams to ensure that they were achieving optimal rates of ANCS documentation and that ANCS administration was accurately documented in the medical record and birth registry. Furthermore, OPQC teams tracked rates of ANCS administration at their own hospital to monitor improvement in rates of ANCS administration as changes were implemented.

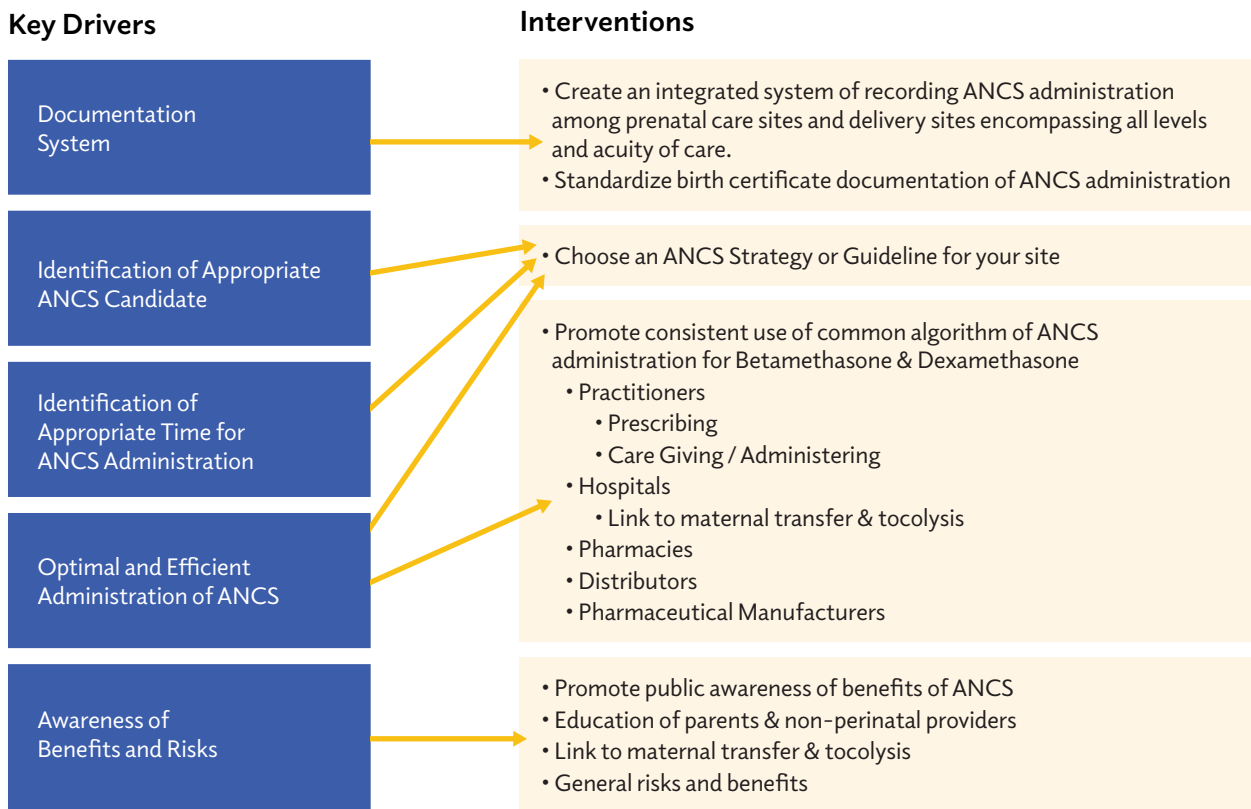


**TOOL #1: MODEL TO IMPROVE ANCS ADMINISTRATION**

OPQC created the following model to help obstetrical providers and hospital labor and delivery staff better understand how optimal ANCS treatment rates are achieved and to identify the best strategies that hospitals could implement to assure optimal rates. Key drivers of optimal ANCS and interventions designed to target each of these drivers were identified. By implementing these changes, hospitals and obstetrical providers can assure that accurate systems are in place to identify candidates for treatment and to assure documentation of prescription and receipt of ANCS by perinatal caregivers.

**MODEL TO IMPROVE ANCS ADMINISTRATION**

**Global Aim:** Assure that all infants born between 24 0/7 and 33 6/7 weeks’ gestation receive appropriate antenatal corticosteroid treatment to reduce perinatal morbidity and mortality.





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## TOOL #2: DATA COLLECTION FORM

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*A key part of any effort to optimize ANCS treatment is knowing your own hospital's rates of administration. The following "Data Collection Form" can be used to evaluate all births before 34 weeks' gestation to determine whether the mother received ANCS. It was developed by OPQC to help hospitals track their rates of ANCS administration, understand in more detail the characteristics of their patient population, whether women are receiving a full (vs. partial) course of steroids, and data about the time interval from administration to delivery.*

*Data to track your hospital's rates of ANCS administration can also be obtained from state vital statistics (birth registry) data, The Joint Commission Perinatal Core Measures Set, and Vermont Oxford Network registry (for participating hospitals).*

## DATA COLLECTION FORM: OPQC: ANTENATAL CORTICOSTEROIDS (ANCS) USE

- Complete a form for ALL Infants at or between 24<sup>0/7th</sup> weeks and 33<sup>6/7th</sup> weeks gestational age at delivery
- Do Not complete a form if infant was < 24<sup>0/7th</sup> weeks or > 33<sup>6/7th</sup> weeks gestational age at delivery
- If the delivery is of multiples, please complete 1 form for each baby delivered

<p>1. Gestational age at delivery: _____ weeks _____ days</p> <p>2. Birth weight _____ lbs. _____ oz  <b>OR</b> _____ grams</p> <p>3. Is this a multiple birth?  <input type="radio"/> Yes  <input type="radio"/> No (<i>skip to Question 5</i>)</p> <p>4. If this is a multiple birth – please indicate the number of fetuses.          _____ (whole number only)</p> <p>5. How was gestational age determined?  <input type="radio"/> Ultrasound &lt;= 20 weeks  <input type="radio"/> Ultrasound &gt; 20 weeks  <input type="radio"/> Other _____</p> <p>6. What date/time did the mother arrive at the delivering hospital?          Date _____ (mm/dd/yyyy)          Time ____:____ (HH:MM) (24 hr. clock)</p> <p>7. Were membranes ruptured prior to arrival at the delivering hospital?  <input type="radio"/> Yes  <input type="radio"/> No</p> <p>8. What date and time was the baby born?          Date _____ (mm/dd/yyyy)          Time ____:____ (HH:MM) (24 hr. clock)</p> <p>9. What was the reason for preterm birth?  <input type="radio"/> PTL  <input type="radio"/> PPROM  <input type="radio"/> Bleeding (any cause or diagnosis)  <input type="radio"/> High blood pressure (any cause or diagnosis)  <input type="radio"/> Other: _____</p> <p><b><u>Steroid (ANCS) Administration</u></b></p> <p>10. What type of ANCS medication was given?  <input type="radio"/> Betamethasone  <input type="radio"/> Dexamethasone (<i>skip to Question 12</i>)  <input type="radio"/> No ANCS medication given <b>STOP</b></p> <p>11. How many <b>doses</b> of <b>Betamethasone</b> were administered at any time by any provider prior to delivery? (<i>1 dose = 1 injection of betamethasone</i>)  <input type="radio"/> Zero  <input type="radio"/> One  <input type="radio"/> Two  <input type="radio"/> Three or more  <input type="radio"/> Can't determine</p>	<p>12. How many <b>doses</b> of <b>Dexamethasone</b> were administered at any time by any provider prior to delivery? (<i>1 dose = 1 injection of dexamethasone</i>)  <input type="radio"/> Zero  <input type="radio"/> One  <input type="radio"/> Two  <input type="radio"/> Three  <input type="radio"/> Four  <input type="radio"/> Five or more  <input type="radio"/> Can't determine</p> <p>13. What date &amp; time did the mother receive her <b>first</b> dose of steroids?          Date _____ (mm/dd/yyyy)  <input type="checkbox"/> Can't determine date          Time ____:____ (HH:MM) (24 hr. clock)  <input type="checkbox"/> Can't determine time</p> <p>14. <b>Where</b> was the 1st dose of steroids given?  <input type="radio"/> Referring Hospital  <input type="radio"/> Delivery Hospital  <input type="radio"/> Clinic or Doctor's office  <input type="radio"/> Emergency Dept  <input type="radio"/> Can't determine</p> <p>15. <b>Where</b> were subsequent doses of steroids given? (Check <b>all</b> that apply)  <input type="radio"/> Referring Hospital  <input type="radio"/> Delivery Hospital  <input type="radio"/> Clinic or Doctor's office  <input type="radio"/> Emergency Dept  <input type="radio"/> Can't determine</p> <p>16. What date &amp; time did the mother receive her <b>last</b> dose of steroids?          Date _____ (mm/dd/yyyy)  <input type="checkbox"/> Can't determine date          Time ____:____ (HH:MM) (24 hr. clock)  <input type="checkbox"/> Can't determine time</p> <p>17. How many <b>courses</b>* of ANCS did the mother receive in the pregnancy?  <i>*Full course = 2 injections of betamethasone or 4 injections of dexamethasone</i>  <input type="radio"/> Did not receive steroids  <input type="radio"/> Part of 1 Course  <input type="radio"/> 1 Course  <input type="radio"/> 2 Courses  <input type="radio"/> More than 2 Courses  <input type="radio"/> Can't determine</p>
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## Key Driver 1: Establishing an ANCS Documentation System

Establishing a documentation system to reliably record ANCS administration is crucial to improving ANCS treatment rates. Consistently recording ANCS administration will help ensure that needed treatment is not missed or that too many doses of ANCS are not given, which can have harmful effects on the baby. In addition, standardizing data documentation and collection, improves the accuracy of state vital statistics records of prenatal care.

### Improving Documentation in the Medical Record & Birth Registry:

Accurately recording data in the medical record is essential to providing safe care and ensuring that all care providers are making accurate and informed treatment decisions. Documentation of ANCS treatment was found to be highly variable, which made it difficult to accurately determine administration rates. Some of the documentation issues include:

- Variation in the location of ANCS documentation within hospital and outpatient charts;
- Variation in the way the steroids were identified in the charts, with generic and brand names noted as well as a variety of abbreviations used;
- Hospital charts often do not reflect when ANCS has been administered at a previous location, such as a doctor's office or when a mother is being transferred from one hospital to another.

Issues with variable documentation of ANCS administration in the medical record also led to inaccurate documentation in other data sources including the state birth registry.

The birth registry is the largest perinatal database in the United States. Decisions about research priorities, funding, and public policy are made based on the assumption that birth registry data are correct. An accurate birth registry affects the work of everyone who works to improve care for pregnant women and their infants. OPQC found that rates of ANCS administration reported on birth registries

“The focus of healthcare for women and infants over the next century depends on the quality of the data collected by those who fill out the birth registries.”

- Bill Callaghan, MD, MPH, Centers for Disease Control and Prevention, Atlanta, GA

grossly underestimated rates found on medical record chart; therefore, OPQC teams made changes to improve documentation in both the medical record and birth registry.

## Changes to Improve Documentation

The following processes are recommended to help improve documentation of ANCS treatments in both the medical record and birth registry:

- Standardizing ANCS reporting within medical records, both electronic and paper charts—recording it in same place every time and using the same language;
- Giving birth registry staff access to all pertinent sections of electronic medical records;
- Educating birth registry staff on medical terminology, processes for data abstraction, and the importance of accuracy; for example, OPQC discovered that birth registry staff often misunderstood how to correctly record gestational age. *Gestational age is never to be rounded up; it is recorded in completed weeks. 38 weeks, and 5 days is properly termed 38 weeks.* Correcting this error resulted in more accurate birth registry entries.
- Increasing communication between clinical staff and birth registry staff to encourage questions and answers that improve accuracy;
- Auditing birth registry data for accuracy.

“I think some of the biggest changes we made...[were] making sure there’s a place to document where the steroids were given. If you can’t find the place [to document it] and you don’t know how to make it easy, then that information won’t transfer over to the birth registry.”

- QI Team





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## TOOL #3: FLOWCHART FOR BIRTH REGISTRY STAFF

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*Flowcharts allow you to identify the sequence of events in a process. Flowcharts are also a great way to have a team come to an agreement on the steps of a process and what activities may impact its performance. Problem areas, unnecessary loops, and places where simplification and standardization may be possible can be identified with a flow chart. Before beginning to test changes, an important first step is to create a flow chart to understand how clinical and birth registry staff presently document ANCS in the birth registry. This flowchart example is intended to help clinical and birth registry staff visualize their present system of ANCS administration, documentation, and abstraction to the birth registry. Notice areas where a decision needs to be made (indicated by blue boxes). It is at these decision points where the greatest threat of a potential missed opportunity is found.*

## FLOWCHART FOR BIRTH REGISTRY STAFF

### Accurate Birth Registry Documentation of ANCS Administration



## FLOWCHART FOOTNOTES

- \* Steroids (glucocorticoids) or ANCS definition and instructions may be found in the Guide to Completing the Facility Worksheet for Certificate of Live Birth. NCHS (National Center for Health Statistics, 2003) #27 or Ohio Department of Health/Office of Vital Statistics, 2013 #22 This category is called Characteristics of Labor and Delivery: Steroids (glucocorticoids) (ANCS) for fetal lung maturity received by the mother before delivery.
  
- \*\* Pertinent data sources for birth registry data abstraction
  - Physician office prenatal summary
  - Labor and delivery summary
  - Maternal medical record
  - Maternal physician order sheet
  - Medication administration record
  - Physician maternal admission history
  - Nursing maternal admission history
  - Newborn admission history
  - Maternal self-reported prenatal history. (answer to the question: “Did you ever receive medication during this pregnancy that was given to help your baby’s lungs mature?”)
  - Transfer notes from referring hospital
  - Discharge summary notes from previous hospitalizations during this pregnancy
  - Facility Worksheet for the Live Birth Registry (NCHS or state specific)
  - Guide to Completing the Facility Worksheet for Certificate of Live Birth
  
- \*\*\* OB Estimate of Gestational Age is arguably the most important variable in the birth registry. Interpretation of many other variables is made through the lens of gestational age at delivery. It is essential to obtain the most accurate estimate. OB Estimate of Gestational Age is determined by the physician or nurse midwife, before delivery. The most accurate OB estimate of gestational age is determined from an early (less than 20 week) ultrasound. See #31 NCHS or Ohio #27 Guide to Completing the Facility Worksheet for Certificate of Live Birth
  
- \*\*\*\*Tocolytics (also called anti-contraction medications or labor repressants) are medications used to suppress premature labor. They are given when delivery would result in premature birth. Tocolytic therapy also buys time for the administration of antenatal corticosteroids, (ANCS) dexamethasone or betamethasone, to accelerate fetal lung maturity

## Key Driver 2: Improving Identification of Eligible Mothers

Identification of women eligible to receive ANCS is critical to the treatment's optimal use. In the OPQC project, giving birth less than two hours after arriving at the hospital, for example, was by far the most common explanation given in cases where ANCS was not administered to an otherwise eligible woman.

Hospitals that achieve high rates of ANCS use typically involve multiple staff members in assessing a patient and deciding to administer ANCS. It is particularly important that obstetricians and other labor and delivery staff members are in communication with maternal-fetal medicine specialists or perinatologists, who specialize in caring for women with high-risk pregnancies, as well as neonatal intensive care unit staff.

A standard approach to identify eligible women removes the potential for human error, especially in a high stress situation such as threatened early delivery. Each hospital should strive for agreement among their team.

Interventions that can help ensure that eligible women are appropriately identified include:

- Standardizing communication processes at the time of maternal transfer from one hospital to another to ensure eligible women are identified (Tool #4);
- Empowering nurses to recognize an opportunity to give ANCS and remind physicians to consider and order it;
- Standardizing your hospital's approach to identifying eligible women and the time frame that indicates "imminent delivery" when ANCS should not be administered

"We're ... mak[ing] up a transfer sheet so that when we do have a nurse calling us from another unit, that my nurses can ask specific questions... [steroids] was one of the things that they want to put on that so they can find out the date and time if they have the first shot."

- Nurse (Manager)



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## TOOL #4: MATERNAL TRANSFER FORMS

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*During a care transition between staff from different institutions, physicians, and nurses involved should make a point of discussing ANCS administration. Here are a few examples of standardized forms that can be used at the time of transfer to ensure that eligible women are considered for ANCS. These forms are designed to standardize communication so that key care decisions are considered when a mother at-risk for preterm birth is transferred from one hospital to another. The important point about these tools is that your forms do not have to look exactly like this, but they should provide a way to consistently and reliably report important clinical information, including ANCS administration, during care transitions.*

## TRANSFER SUMMARY FORM FOR REFERRING HOSPITALS

<b>Situation</b>	Patient Name: _____ Date and Time: _____ Referring Physician/Hospital: _____ Receiving hospital: _____ Reason for transport: _____ Age: ____ Gravida: ____ Para: ____ EDC: _____ Est. Gestation: ____ Based on : <input type="checkbox"/> LMP <input type="checkbox"/> US Expected Time of Arrival: _____ Copy of Prenatal to Receiving Hosp: <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Background</b>	<p><b>Current Pregnancy:</b> _____ Blood Type and Rh _____</p> <p><input type="checkbox"/> PTL <input type="checkbox"/> P.R.O.M. <input type="checkbox"/> Preeclampsia <input type="checkbox"/> Gestational Hypertension <input type="checkbox"/> Bleeding <input type="checkbox"/> Previa <input type="checkbox"/> IUGR</p> <p><input type="checkbox"/> Oligiohydramnios <input type="checkbox"/> Gestational Diabetes <input type="checkbox"/> Hyperemesis <input type="checkbox"/> Multiples <input type="checkbox"/> Other _____</p> <p><u>GBS Status:</u> <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Pending <input type="checkbox"/> Unknown <u>Tox Screen:</u> _____</p> <p><u>Hepatitis B Status:</u> <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Pending <u>HIV Status:</u> <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Unknown</p> <p><u>Rubella:</u> <input type="checkbox"/> Immune <input type="checkbox"/> Non Immune <u>RPR:</u> <input type="checkbox"/> Positive <input type="checkbox"/> Negative</p> <p><u>Bacterial/Viral Cultures:</u> Copy of Results sent <input type="checkbox"/> Yes <input type="checkbox"/> No <u>Cultures Pending:</u> <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><b>Past OB History:</b></p> <p><input type="checkbox"/> PTL/PTB <input type="checkbox"/> Preeclampsia <input type="checkbox"/> Gestational Hypertension <input type="checkbox"/> P.R.O.M. <input type="checkbox"/> IUGR <input type="checkbox"/> Prior C-Section</p> <p>Other: _____</p> <p><b>Medical History:</b></p> <p><input type="checkbox"/> Diabetes <input type="checkbox"/> Chronic HTN <input type="checkbox"/> Asthma <input type="checkbox"/> Thrombophilia <input type="checkbox"/> STD <input type="checkbox"/> HSV <input type="checkbox"/> Other: _____</p> <p>Allergies: _____ Surgeries: _____</p> <p>Medications: _____</p>
<b>Assessment</b>	<p>Vital Signs: T _____ P _____ R _____ BP _____ FHR Baseline _____</p> <p>Physical Exam Findings (Check all that apply): <input type="checkbox"/> Pain: _____ <input type="checkbox"/> Bleeding: _____</p> <p>Cervix: Dilation _____ Effacement _____ Station _____ <input type="checkbox"/> Deferred</p> <p>Presentation: <input type="checkbox"/> Vertex <input type="checkbox"/> Breech <input type="checkbox"/> Transverse Determined by: <input type="checkbox"/> VE <input type="checkbox"/> US</p> <p>Membranes: <input type="checkbox"/> Intact <input type="checkbox"/> Ruptured Date: _____ Time: _____</p> <p>Fluid: <input type="checkbox"/> Clear <input type="checkbox"/> Light Meconium <input type="checkbox"/> Thick Meconium <input type="checkbox"/> Bloody <input type="checkbox"/> Foul Smelling</p> <p>Labor: Time of Onset: _____ <input type="checkbox"/> Not in Active Labor</p> <p>Contractions: Frequency _____ Duration _____ Intensity: <input type="checkbox"/> Mild <input type="checkbox"/> Moderate <input type="checkbox"/> Strong</p> <p>FHR: <input type="checkbox"/> Accels <input type="checkbox"/> Decels _____ <input type="checkbox"/> Variability _____</p> <p>IV: _____ Medications given/Time last dose: _____</p> <p><b>Antenatal Steroids:</b> Not indicated: _____</p> <p>Betamethasone (1<sup>st</sup> dose): Date _____ Time _____</p> <p>Betamethasone (2<sup>nd</sup> dose): Date _____ Time _____</p> <p><b>Magnesium:</b> Not indicated: _____</p> <p>Bolus: Dose: _____ Time Completed _____</p> <p>Maintenance: Dose _____ Time Started _____</p> <p>Labs/Diagnostic Tests _____ Copies sent: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Pending</p>
Recommendation Plan of Care/Additional Information: _____ _____ Transferring Nurse (print): _____ SBAR Report Given to Receiving Nurse (print) _____	

# PHYSICIAN TRANSPORT INTAKE FORM

<b>Situation</b>	Patient Name: _____ Date of Hospital Admission: _____ Referring OB: _____ Referring Hospital: _____ Age: _____ Gravida: _____ Para: _____ Gestation: _____ <b>Current Situation:</b>
<b>Background</b>	<b>Pertinent Information About Current Pregnancy:</b> <input type="checkbox"/> PTL <input type="checkbox"/> P.R.O.M. <input type="checkbox"/> Preeclampsia <input type="checkbox"/> Gestational Hypertension <input type="checkbox"/> Bleeding <input type="checkbox"/> Placenta Previa <input type="checkbox"/> IUGR <input type="checkbox"/> Oligiohydramnios <input type="checkbox"/> Gestational Diabetes <input type="checkbox"/> Hyperemesis <input type="checkbox"/> Multiples <input type="checkbox"/> Other _____ GBS Status: <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Pending <input type="checkbox"/> Unknown Blood Type and Rh _____ Allergies _____ <b>Other Relevant History:</b>
<b>Assessment</b>	Vital Signs: T _____ P _____ R _____ BP _____ Physical Exam Findings: <input type="checkbox"/> Bleeding: _____ Cervix: Dilatation _____ Effacement _____ Station _____ <input type="checkbox"/> Deferred Presentation: <input type="checkbox"/> VTX <input type="checkbox"/> Breech <input type="checkbox"/> Transverse Determined by: <input type="checkbox"/> VE <input type="checkbox"/> US Membranes: <input type="checkbox"/> Intact <input type="checkbox"/> Ruptured Labor: <input type="checkbox"/> In Active Labor <input type="checkbox"/> Not in Active Labor Contractions: Frequency _____ Duration _____ Intensity: <input type="checkbox"/> Mild <input type="checkbox"/> Moderate <input type="checkbox"/> Strong FHR: <input type="checkbox"/> Accels <input type="checkbox"/> Decels _____ <input type="checkbox"/> Variability _____ Medications given: 1. _____ 2. _____ 3. _____ Labs drawn: _____ Diagnostic Tests completed _____
<b>Recommendation</b>	<b>Transport Plan:</b> <input type="checkbox"/> Air Transport <input type="checkbox"/> Ground Transport <b>Interventions Prior to Transport:</b> Airway: <input type="checkbox"/> Stable <input type="checkbox"/> Intubate Breathing: <input type="checkbox"/> Stable/Room Air <input type="checkbox"/> Nasal Cannula <input type="checkbox"/> Intubation/Ventilation Circulation: <input type="checkbox"/> Stable <input type="checkbox"/> LR/NS bolus <input type="checkbox"/> PRBC <input type="checkbox"/> Pressors Antenatal Steroids: <input type="checkbox"/> Already Given <input type="checkbox"/> To Be Given Prior to Transfer <input type="checkbox"/> Not Indicated _____ Magnesium: <input type="checkbox"/> Already Started <input type="checkbox"/> To Be Started Prior to Transfer <input type="checkbox"/> Not Indicated _____ IV Access: <input type="checkbox"/> Established <input type="checkbox"/> Not Established, Recommend: _____ <b>Admit to:</b> <input type="checkbox"/> ICU <input type="checkbox"/> Labor & Delivery <input type="checkbox"/> Antepartum <input type="checkbox"/> ED Signature _____

## NURSING TRANSPORT SBAR

<b>Situation</b>	Patient Name: _____ Referring hospital: _____ Referring physician _____ Age: _____ Gravida: _____ Para: _____ Gestational Age: _____ Based on : <input type="checkbox"/> LMP <input type="checkbox"/> US
<b>Background</b>	Blood Type and Rh _____ Allergies _____ <b>Pertinent Information About Current Pregnancy:</b> <input type="checkbox"/> PTL <input type="checkbox"/> P.R.O.M. <input type="checkbox"/> Preeclampsia <input type="checkbox"/> Gestational Hypertension <input type="checkbox"/> Bleeding <input type="checkbox"/> Previa <input type="checkbox"/> IUGR <input type="checkbox"/> Oligiohydramnios <input type="checkbox"/> Gestational Diabetes <input type="checkbox"/> Hyperemesis <input type="checkbox"/> Multiples <input type="checkbox"/> Other _____ <u>GBS Status:</u> <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Pending <input type="checkbox"/> Unknown Other relevant history: _____ <b>Pertinent Medical History:</b> <input type="checkbox"/> Diabetes <input type="checkbox"/> Chronic HTN <input type="checkbox"/> Asthma <input type="checkbox"/> Thrombophilia <input type="checkbox"/> STD <input type="checkbox"/> HSV <input type="checkbox"/> Other: _____ Medications: _____
<b>Assessment</b>	Vital Signs: T _____ P _____ R _____ BP _____ Physical Exam Findings: <input type="checkbox"/> Pain: _____ <input type="checkbox"/> Bleeding: _____ Cervix: Dilation _____ Effacement _____ Station _____ <input type="checkbox"/> Deferred Presentation: <input type="checkbox"/> Vertex <input type="checkbox"/> Breech <input type="checkbox"/> Transverse Determined by: <input type="checkbox"/> VE <input type="checkbox"/> US Membranes: <input type="checkbox"/> Intact <input type="checkbox"/> Ruptured Date: _____ Time: _____ Fluid: <input type="checkbox"/> Clear <input type="checkbox"/> Light Meconium <input type="checkbox"/> Thick Meconium <input type="checkbox"/> Bloody <input type="checkbox"/> Foul Smelling Labor: <input type="checkbox"/> In Active Labor <input type="checkbox"/> Not in Active Labor Contractions: Frequency _____ Duration _____ Intensity: <input type="checkbox"/> Mild <input type="checkbox"/> Moderate <input type="checkbox"/> Strong FHR: <input type="checkbox"/> Accels <input type="checkbox"/> Decels _____ <input type="checkbox"/> Variability _____ IV: _____ Rate: _____ <b>Antenatal Steroids:</b> Not indicated: _____ Betamethasone (1stdose): Date _____ Time _____ Betamethasone (2 <sup>nd</sup> dose): Date _____ Time _____ <b>Magnesium:</b> Not indicated: _____ Bolus: Dose: _____ Time Completed _____ Maintenance: Dose _____ Time Started _____ Medications given/Time last dose: 1. _____ 2. _____ 3. _____ Labs drawn: _____ Diagnostic Tests completed _____
<b>Recommendation</b>	Interventions prior to transport: _____ Copy of prenatal given to team: yes ___ no ___ Transferring Nurse Name (Print): _____ SBAR Report Given to (Print Receiving RN Name): _____



## Key Driver 3: Timely and Efficient Administration of ANCS

When reviewing missed opportunities to administer ANCS, OPQC teams found evidence of a small number of system failures—such as ANCS was never ordered, or it was ordered but never administered. Once a woman is identified as eligible, is it important to have processes that ensure that the treatment is ordered and that ANCS is administered as quickly as possible to ensure that there is adequate time for drug effects prior to delivery. Hospitals with high-rates of ANCS administration tend to emphasize reliability and efficiency in their administration processes by:

- Using reminders, such as posted signs, to heighten urgency for administration; one commonly used example is a sign in the Labor & Delivery nurses station that says, “It’s been xxx days since we missed an opportunity to give antenatal steroids to an eligible mother!”
- Making ANCS readily available by stocking it on the unit or having a special system in place to consistently ensure a rapid response from pharmacy.

A helpful administrative procedure is the use of reminders posted where staff can see them clearly. For example, including signs in the triage area where ANCS are typically administered can help instill a sense of urgency for administration when a women presents in preterm labor.

Similarly, it is important to ensure that the appropriate clinicians are readily available to assess pregnant women in preterm labor in a timely manner.

## Key Driver 4: Raising Awareness of Risks & Benefits of ANCS

A significant amount of reliable evidence has built up over time demonstrating the benefits of ANCS use in preterm births. As one QI project participant said, “The data is there.” *And in hospitals that achieve high rates of ANCS use, all members of the care team, including physicians, nurses, trainees, and even patients themselves,*

“...we can order from the pharmacy, but if...someone is actively in labor and you need to get them [ANCS] sooner, we do have a floor stock of it so we can get it. It’s easily accessible so we have them all the time.”

- Nurse

“I think what helps us...is educating the patients when they’re receiving steroids about what their receiving and why they’re receiving it and knowing, “by the way, you’re receiving this, so if someone asks you in the future, you received it and there were two injections or four injections and this is why.’ I think that helps.”

- QI Team Physician Lead

*know about the benefits of ANCS in preterm births so that everyone can watch for the opportunity to administer them.* It also is important for staff at community-based facilities, where pregnant women often receive most of their prenatal care, to understand the evidence and recommendations of ANCS as a standard of care for women from 24 to 33 weeks gestation at risk for pre-term birth.

As mentioned previously, ACOG states that a second “rescue” course of ANCS may be given to women, under certain conditions, who received it previously but did not deliver at that time. It is likely that this recommendation is helping to support the use of ANCS because physicians are more confident about the safety of giving a second course if needed. Similarly, it also is important to understand the risks of ANCS. Excessive exposure to steroids, or greater than 2 courses of ANCS in the prenatal period, may impair development in young children.

## Building a “High Reliability” Culture

In addition to focus on the four key categories that drive optimizing ANCS administration that were initially outlined in the Model to Improve ANCS Administration, OPQC identified several attributes or characteristics that hospitals with high rates of ANCS administration have in common. For example, in general, hospitals with ANCS rates at 90% and above focus on consistently providing the highest quality care, including reliably following established best practices, such as the administration of ANCS.

In these hospitals, which are said to have a “high-reliability culture,” professionals are extra vigilant about the potential for failure and place a high priority on formally reviewing the causes of missed opportunities—those times when ANCS could have been administered, but was not.

To capture and help understand the reasons that ANCS may be missed, OPQC encourages hospitals to track the causes of missed opportunities to administer ANCS. Recording and tracking this information will help staff reduce the gap between eligible women who receive ANCS and those who do not.

“We’re trying to drill down into those few cases that we’re missing [the opportunity to give ANCS] to see why, what happened. So reviewing them, bringing them up, talking to the providers who were taking care of the patient, really give them the information, ‘you missed a case and this what we think you could have done differently.’”

- QI Team Physician Lead

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## TOOL #5: CORTICOSTEROID INVESTIGATION (CSI) FORM

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*A corticosteroid investigation (or CSI) form like the one below can help you identify the reason why an opportunity to administer ANCS was missed. Using this form consistently over time and in conjunction with the data collection form (Tool #1), can help you and your team identify where you can make changes to lessen the risk of future misses.*

## TRACKING MISSED ANCS OPPORTUNITIES

In order to identify common clinical and systems issues preventing greater than 90% of identified women who may benefit from receiving ANCS from actually receiving ANCS, teams should pay attention to specific reasons in their hospitals that these opportunities may have been missed. Teams can use a CSI or Corticosteroid Investigation form to record these reasons. By recording and tracking the reasons for these gaps or misses, all teams can learn and improve.

### OPQC “Corticosteroid Investigation”

Hospital: \_\_\_\_\_

Date of Delivery: \_\_\_\_\_ Time of Delivery: \_\_\_\_\_

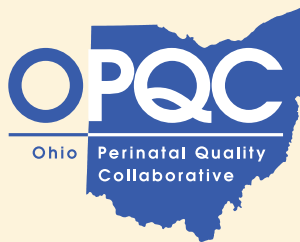
Check one of the reasons the patient did not receive ANCS.

- Short Interval from Presentation to Delivery
  - Interval < 2 hrs
  - Interval < 2 hr expected
  - Evaluation Delayed
- Admitted with working diagnosis not expected to result in early delivery but condition rapidly changed
- ANCS not given at referring hospital before transfer
- ANCS not ordered, or ordered but not given (System Failure)
- Not Eligible for ANCS
- Prenatal Diagnosis of Lethal anomalies (e.g., renal agenesis)
- Steroids intentionally withheld due to documented medical reason (e.g. rule out sepsis evaluation)
- Gestational age < 24 or > 34 weeks.



## References

- <sup>1</sup> Gerald J. Langley, Ronald Moen, Kevin M. Nolan, Thomas W. Nolan, Clifford L. Norman, Lloyd P. Provost. *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance*, San Francisco: Jossey-Bass, 2009.
- <sup>2</sup> American College of Obstetricians and Gynecologists (ACOG). Management of preterm labor. Practice Bulletin No. 127. *Obstetrics and Gynecology*. 2012; 119:1308-17.
- <sup>3</sup> Liggins GC and Howie RN. A controlled trial of antepartum glucocorticoid treatment for prevention of respiratory distress syndrome in premature infants. *Pediatrics*. 1972; 50(4):515-25.



The Ohio Perinatal Quality Collaborative includes hundreds of clinicians, 105 hospitals and clinics, the Ohio Department of Health, the March of Dimes and other stakeholders around the state dedicated to improving perinatal health in Ohio. To that end, OPQC members use scientific methods shown to reduce preterm births in Ohio, which sees more infants die each year than most other states.

