Antenatal Corticosteroids

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This guideline is updated to emphasize indications for antenatal corticosteroids in the periviable and late preterm periods.

Highlights

- Antenatal corticosteroid administration depends on risk for delivery in the next 7 days and gestational age.
- A rescue course of steroids could be considered if the patient is undelivered 7 days after the second dose of betamethasone and there remains of risk for preterm birth within the next 7-14 days. Gestational age ≥34w0d is a contraindication to a rescue course of steroids.
- A single course of late preterm steroids can be considered between 34w0d-36w6d if the patient is at risk for delivery within the next 7 days.
- Use of betamethasone for fetal lung maturity in fetuses < 24 weeks should occur in conjunction with maternal fetal medicine and neonatology consultations

Background

Corticosteroid administration before anticipated preterm birth is one of the most important antenatal therapies available to improve newborn outcomes.[1] Antenatal corticosteroid (ACS) therapy leads to improvement in neonatal lung function by enhancing maturational changes in lung architecture and by inducing lung enzymes resulting in biochemical maturation. ACS therapy reduces the incidence of respiratory distress syndrome, intraventricular hemorrhage, necrotizing enterocolitis, sepsis, and neonatal mortality by approximately 50%. A course of ACS consists of 12 mg betamethasone (BMZ) intramuscularly every 24 hours for two doses (preferred regimen) or 6 mg dexamethasone (DMZ) http://www.utdol.com intramuscularly every 12 hours for four doses.[1] **The benefit of ACS administration is greatest at 2–7 days after the initial dose. Treatment with ACS for less than 12-24 hours is still associated with significant reduction in neonatal morbidity and mortality, so a first dose of ACS should be administered even if the ability to give the second dose is unlikely, based on the clinical scenario**.[1-4] No additional benefit has been demonstrated for courses of ACS with dosage intervals shorter than those outlined previously, however, even when delivery appears imminent.[1]

ACOG recommends a single course of corticosteroids for pregnant people between 24 0/7 weeks and 33 6/7 weeks of gestation, including for those with ruptured membranes and multiple gestations, who are at high risk of preterm delivery..[1] A Cochrane meta-analysis reinforces the beneficial effect of this therapy regardless of

membrane status and concludes that a single course of antenatal corticosteroids should be considered routine for all preterm deliveries.[3,5] **This guideline provides recommendations/considerations for administration of a single course of antenatal corticosteroids, including prior to 24 weeks gestation and after 34 weeks gestation as well as indications for a rescue course of steroids.**

When to Consider a Rescue Course of Steroids

Clinical trials investigating repeat doses of ACS have shown an association with higher rates of cerebral palsy[6] and a decrease in birth weight, birth length and head circumference, especially after four courses of ACS.[7] A single repeat course of ACS, however, has been shown to reduce incidence of respiratory distress syndrome, need for surfactant, and composite morbidity..[8] **Rescue course ACS can be provided as early as 7 days from the prior dose, if indicated by the clinical scenario; however, rescue course ACS is not recommended after 34w0d**.[1]

Late Preterm Steroids (ALPS) after 34w0d

ACOG and SMFM now recommend offering a single course of betamethasone for pregnant people between 34 0/7 weeks and 36 6/7 weeks of gestation at risk of preterm birth within 7 days, and who have not received a previous course of antenatal corticosteroids.[1,9] In a double-blind, placebo-controlled, randomized controlled trial, the administration of antenatal late preterm steroids (ALPS) led to a significant decrease in the need for respiratory support. Severe respiratory complications, transient tachypnea of the newborn, surfactant use, and bronchopulmonary dysplasia occurred significantly less frequently in the betamethasone group, while neonatal hypoglycemia was more common in the betamethasone group.[10] ALPS can be considered in people between 34 0/7 to 36 6/7, with preterm labor (cervical >3cm dilated and/or 75% effaced with regular contractions), PPROM, planned late preterm delivery (for example, placenta accreta, placenta previa, vasa previa, preeclampsia, oligohydramnios). People were excluded from ALPS for the following criteria: 1) prior course of antenatal corticosteroids during the pregnancy (before 34 weeks); 2) candidate for stress-dose corticosteroids; 3) twin gestation; 4) known major fetal anomaly; 5) pregestational diabetes; 6) chorioamnionitis; 7) delivery expected within 12 hours due to ruptured membranes with cervical dilation of at least 3 cm, cervical dilation of at least 8cm, or non-reassuring fetal tracing requiring delivery.[10] Tocolysis should not be used to delay delivery to administer ALPS. **Additionally, an indicated preterm delivery (such as preeclampsia with severe features) should not be postponed to administer ALPS**.[1] If late antenatal steroids are administered, the NICU team should be notified due to the risk of neonatal hypoglycemia. Additionally, people should be counseled regarding the known short-term benefits but lack of long-term outcome data in offspring exposed to ALPS.

ACS Considerations for Periviable Gestations

Data from a Eunice Kennedy Shriver NICHD Neonatal Research Network observational cohort revealed a significant reduction in death and neurodevelopmental impairment at 18-22 months for infants who had been exposed to antenatal corticosteroids and born at 23 0/7 through 23 6/7 weeks of gestation (83.4% vs 90.5%), 24 0/7 through 24 6/7 weeks of gestation (68.4% vs 80.3%), and 25 0/7 through 25 6/7 weeks of gestation (52.7% vs 67.9%). .[1] .

A 2021 systematic review and meta-analysis that included 31 retrospective, observational studies of 2,226 infants who were delivered at 22 0/7 weeks to 22 6/7 weeks of gestation found that survival among infants born to pregnant individuals receiving antenatal corticosteroids was twice that of infants born to pregnant individuals not receiving antenatal corticosteroids (39.0% versus 19.5%; P<.01). One multicenter observational cohort that analyzed over 1,000 live births at 22 0/7 weeks to 22 6/7 weeks of gestation found that infants who received antenatal corticosteroids with postnatal life support were more likely to survive than infants who received postnatal life support alone [38.5% versus 17.7% (adjusted risk ratio, 2.11; 95% CI, 1.68–2.65)]. While survival without a major morbidity was improved with antenatal corticosteroids, the absolute rate of survival without major morbidities still remained very low [4.4% versus 1.0% (adjusted risk ratio, 4.35; 95% CI, 1.84–10.28)]. Based on this new literature, ACOG and SMFM revised their recommendation regarding ACS administration at

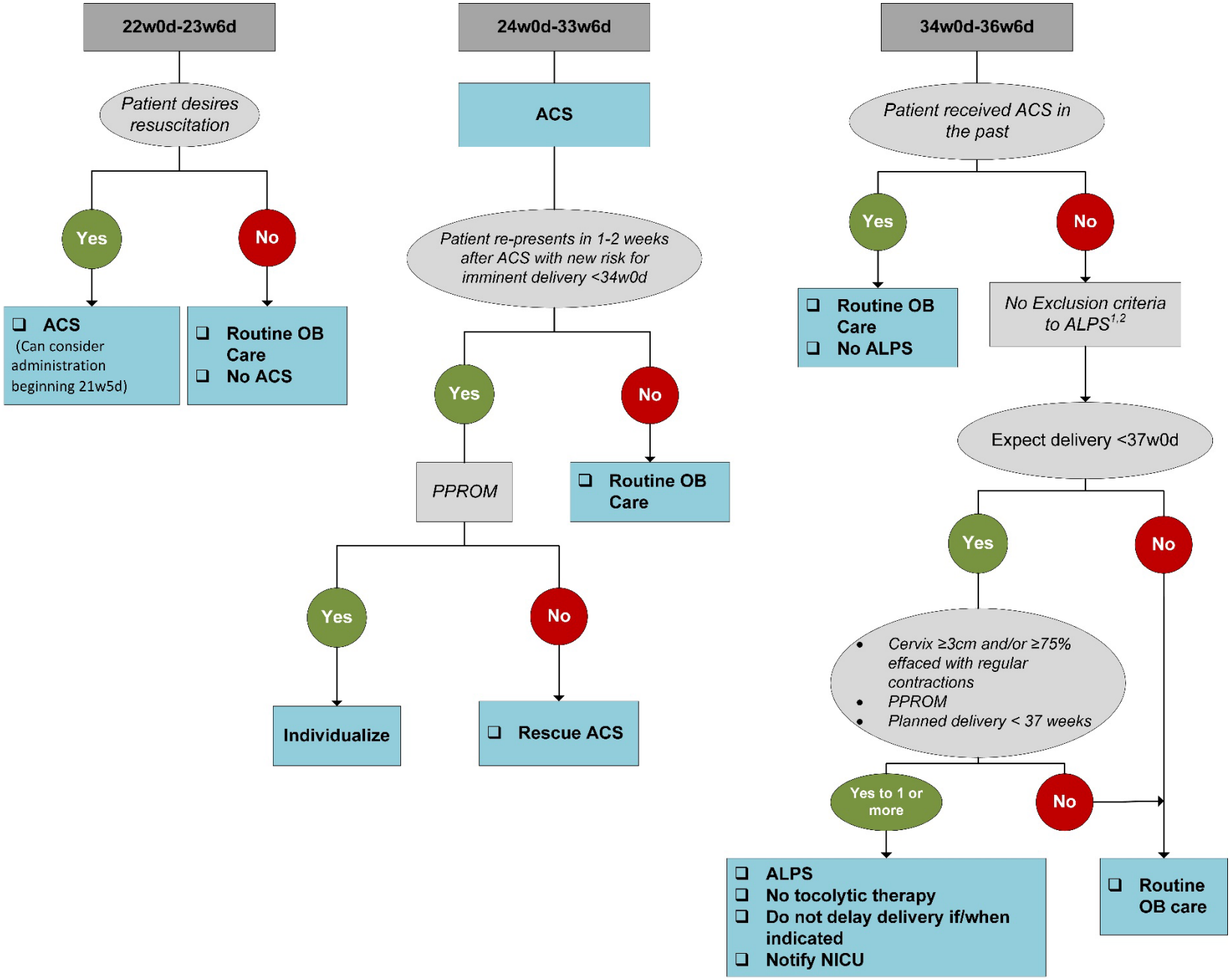
22 weeks of gestation[18]**: Antenatal corticosteroids may be considered starting at 21w5dif neonatal resuscitation is planned at 22 weeks and after appropriate counseling (Figure 1).**

Full recommendations for management of periviable gestations can be found in the Periviability Perinatal Guideline.

General recommendations for ACS administration

Figure 1 highlights recommendations for ACS based on gestational age and clinical considerations.

Figure 1. Antenatal Corticosteroid (ACS) Recommendations for Patients at Risk for PTB within 7 days based on gestational age



[1]ALPS Exclusion Criteria included chorioamnionitis, delivery expected within 12 hours (cervical dilatation ≥8cm, ROM with cervix ≥3cm, non-reassuring fetal status), pregestational diabetes, multiple gestations, and major fetal anomaly).

[2]There should be consideration for the use of antenatal corticosteroids in select populations not included in the original ALPS trial, such as patients with multiple gestations reduced to a singleton gestation on or after 14 0/7 weeks of gestation, patients with fetal anomalies, or those who are expected to deliver in <12 hours.

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