Active Phase Protraction and Arrest Disorder

***ACOG suggests that active phase arrest of labor* be defined as no progression in cervical dilation in patients who are at least 6-cm dilated with rupture of membranes despite 4 hours of adequate uterine activity or 6 hours of inadequate uterine activity with oxytocin augmentation.** (CONDITIONAL RECOMMENDATION, LOW-QUALITY EVIDENCE)

Labor protraction refers to labor progress that is slower than normal, and *labor arrest* is defined as cessation of labor progress despite best attempts at augmentation. Risk factors for protracted or arrested labor include, but are not limited to, nulliparity, large for gestational age fetus, maternal obesity, advanced maternal age, fetal cephalic position (ie, occiput posterior), and cephalopelvic disproportion (34–37). Protraction and arrest disorders are associated with an increased risk of adverse maternal and neonatal outcomes, including cesarean delivery, chorioamnionitis, postpartum hemorrhage, fetal acidemia, and neonatal intensive care unit (NICU) admission (27, 28, 32).

Contemporary data demonstrate that the rate of cervical dilation in the active phase of labor is slower than what was observed historically. The 95th percentile for active-phase dilation ranges from 0.5 cm/hour to 1.3 cm/hour (16); thus, a *protracted active phase* may be conservatively defined as less than 1 cm dilation in 2 hours. However, this range is affected by the patient's admission cervical examination and parity, and these factors should be considered when protracted labor is suspected.

Several studies have evaluated the optimal duration of oxytocin augmentation in the face of labor protraction or arrest. A prospective study of 319 pregnant women with dysfunctional labor found that, with 4 additional hours of oxytocin, 50.7% of nulliparous individuals and 41.7% of multiparous individuals delivered vaginally. In nulliparous patients, a period of 8 hours of augmentation resulted in an 18% cesarean delivery rate. In contrast, if the period of augmentation had been limited to 4 hours, the cesarean delivery rate would have been almost twice as high at 35.5% (38). Thus, a slow but progressive active phase of labor demonstrating cervical change at least every 4 hours in the setting of reassuring maternal and fetal status should not be an indication for cesarean delivery.

A study of more than 500 pregnant women found that extending the minimum period of oxytocin augmentation for active-phase arrest from 2 hours to at least 4 hours allowed the majority of women who had not progressed at the 2-hour mark to give birth vaginally without adversely affecting neonatal outcome (39). The vaginal delivery rate for patients who had not progressed despite 2 hours of oxytocin augmentation was 91% for multiparous individuals and 74% for nulliparous individuals. For those who had not progressed despite 4 hours of oxytocin (and in whom oxytocin was continued at the judgment of the health care professional), the subsequent vaginal delivery rates were 88% in multiparous individuals and 56% in nulliparous individuals. Other subsequent studies have validated these results (40, 41).

These data led to ACOG's 2014 recommendations to liberalize the duration required for *active-phase arrest*, which was defined as no progression in cervical dilation despite 4 hours of adequate uterine activity (more than 200 Montevideo units [MVUs] by intrauterine pressure catheter) or 6 hours of inadequate uterine activity with oxytocin augmentation in patients who are at least 6-cm dilated with rupture of membranes (42). It is important to note that the threshold of 200 MVUs for adequate uterine activity is primarily derived from an observational study of 109 patients performed in 1986, in which the majority (91%) of women with spontaneous vaginal deliveries who underwent oxytocin induction or augmentation achieved greater than 200 MVUs (43).

There are mixed data on whether changes to guidelines and recommendations based on this evidence improved cesarean delivery rates. In a multicenter cluster randomized trial in Norway, labor management using the World Health Organization partograph based on Friedman data was compared with management using Consortium on Safe Labor data (44). There was no difference in cesarean delivery rate or adverse outcomes between the two groups. However, the interpretation of these results is limited by patient characteristics that are different from those of the U.S. population and preexisting evidence that using a partograph may not affect outcomes (45). A cluster randomized trial to determine the effect of the revised ACOG guidelines in 26 hospitals in Alberta, Canada, found no difference in cesarean delivery rates. There was a statistically significant increase in spontaneous vaginal delivery rates among those in the arm adopting the new guidelines, but the clinical benefit was modest: 54.8% to 56.8% (baseline adjusted odds ratio [OR] 1.09; 95% CI, 1.01–1.18) (46). Observational studies on the effect of the revised ACOG guidelines on cesarean delivery rates have shown mixed results, some demonstrating reduction and others demonstrating no effect (30, 47). These studies performed in the United States were limited by their retrospective designs and varied in the way cesarean delivery rates were assessed (primary cesarean delivery rate vs global rate). Thus, the true effect of the 2014 changes in ACOG definitions and guidance for management of labor arrest remains unclear, particularly regarding maternal and neonatal morbidity. However, these suggestions provide a general framework for clinicians to reasonably balance the risks of prolonged labor with the potential benefit of avoiding cesarean delivery, with room for individualization.