

Maine Medical

PARTNERS

Women's Health

A department of Maine Medical Center

Preterm Labor

Definition:

Preterm birth is defined as birth between 20 0/7 and 36 6/7 weeks. The diagnosis of preterm labor is based on the presence of regular contractions accompanied by a change in cervical dilation, effacement, or both, or initial presentation with regular contractions and cervical dilation of at least 2 cm.¹

As tocolytic therapy is generally effective for up to 48 hours; only patients with fetuses that would benefit from this delay in delivery should receive tocolytic therapy.^{1,2} Tocolytics may also give time to allow pregnant patients to be transferred to a tertiary care facility. Use of tocolytics are not recommended prior to neonatal viability.

Box 1. Contraindications to Tocolysis ↵

- Intrauterine fetal demise
- Lethal fetal anomaly
- Nonreassuring fetal status
- Severe preeclampsia or eclampsia
- Maternal bleeding with hemodynamic instability
- Chorioamnionitis
- Preterm premature rupture of membranes*
- Maternal contraindications to tocolysis (agent specific)

*In the absence of maternal infection, tocolytics may be considered for the purposes of maternal transport, steroid administration, or both.

Diagnosis:

Regular contractions **WITH** cervical dilation ≥ 2 cm **OR** cervical effacement of $\geq 80\%$
OR cervical change during observation period

OR

Regular contractions **WITH** cervical length:

< 20 mm, regardless of fetal fibronectin (FFN)

OR

20 – 30 mm **AND** positive FFN result

Evaluation / Management:

Perform sterile speculum exam to rule out rupture of membranes.

Consider obtaining/holding FFN swab if less than 34 weeks.

If FFN is to be used, the following criteria should be met:

1. Amniotic membranes are intact.
2. Cervical dilation is minimal (< 3 cm).
3. Gestational age < 34 weeks.
 - a. Not recommended for routine screening of pregnant population.
 - b. Although a negative test appears to be useful in ruling out preterm delivery that is imminent (i.e, within 2 weeks), the presence of a positive FFN has a **low** positive predictive value for preterm birth.
4. No bleeding, intercourse, or vaginal exam for at least 24 hours prior to sampling.

Evaluate for cervical dilation with sterile vaginal exam and initiate continuous fetal monitoring (with tocometry) while preterm labor evaluation is in progress.

If evaluation is consistent with preterm labor:

- Obtain cultures/testing (group B strep, gonorrhea/chlamydia)
- Perform POC wet mount and/or KOH, if clinically indicated
- Ultrasound for position, estimated fetal weight, biophysical profile, anomalies
- Assess for intrauterine infection and/or placental abruption
- Obtain type & screen, CBC, urinalysis/culture, and consider urine toxicology
- Initiate antenatal corticosteroid course, if appropriate
- Administer antibiotic for GBS prophylaxis, if appropriate
- Administer magnesium sulfate for neuroprotection, if appropriate

First-Line Tocolytic Agents:

1. Nifedipine (calcium channel blocker)
 - Loading dose of 20 mg orally, then continue 20 mg PO every 4 hours
 - Include holding parameters for hypotension
2. Indomethacin (NSAID)
 - Loading dose of 50-100 mg orally, then 50 mg PO every 8 hours, not to exceed 48 hours for treatment course.
 - Should not be administered beyond 31 6/7 weeks gestation.
3. Magnesium Sulfate
 - Loading dose of 4 g IV once, then IV infusion at 2 g/hr
 - Monitor Is & Os **and** for clinical signs/symptoms of magnesium toxicity

Table 1. Common Tocolytic Agents ↵

Agent or Class	Maternal Side Effects	Fetal or Newborn Adverse Effects	Contraindications
Calcium channel blockers	Dizziness, flushing, and hypotension; suppression of heart rate, contractility, and left ventricular systolic pressure when used with magnesium sulfate; and elevation of hepatic transaminases	No known adverse effects	Hypotension and preload-dependent cardiac lesions, such as aortic insufficiency
Nonsteroidal anti-inflammatory drugs	Nausea, esophageal reflux, gastritis, and emesis; platelet dysfunction is rarely of clinical significance in patients without underlying bleeding disorder	In utero constriction of ductus arteriosus*, oligohydramnios*, necrotizing enterocolitis in preterm newborns, and patent ductus arteriosus in newborn†	Platelet dysfunction or bleeding disorder, hepatic dysfunction, gastrointestinal ulcerative disease, renal dysfunction, and asthma (in women with hypersensitivity to aspirin)
Beta-adrenergic receptor agonists	Tachycardia, hypotension, tremor, palpitations, shortness of breath, chest discomfort, pulmonary edema, hypokalemia, and hyperglycemia	Fetal tachycardia	Tachycardia-sensitive maternal cardiac disease and poorly controlled diabetes mellitus
Magnesium sulfate	Causes flushing, diaphoresis, nausea, loss of deep tendon reflexes, respiratory depression, and cardiac arrest; suppresses heart rate, contractility and left ventricular systolic pressure when used with calcium channel blockers; and produces neuromuscular blockade when used with calcium-channel blockers	Neonatal depression‡	Myasthenia gravis

*Greatest risk associated with use for longer than 48 hours.

†Data are conflicting regarding this association.

‡The use of magnesium sulfate in doses and duration for fetal neuroprotection alone does not appear to be associated with an increased risk of neonatal depression when correlated with cord blood magnesium levels. (Johnson LH, Mapp DC, Rouse DJ, Spong CY, Mercer BM, Leveno KJ, et al. Association of cord blood magnesium concentration and neonatal resuscitation. *Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network. J Pediatr* 2011;DOI: 10.1016/j.jpeds.2011.09.016.) [PubMed]

Modified from Hearne AE, Nagey DA. Therapeutic agents in preterm labor: tocolytic agents. *Clin Obstet Gynecol* 2000;43:787-801. [PubMed]

Prophylactic and Maintenance Tocolysis:

- No evidence exists to support the use prophylactic therapy in pregnant patients with preterm contractions without cervical change. Therefore, prophylactic tocolysis is **not** recommended.^{1,3}
- Maintenance therapy with tocolytics is ineffective for preventing preterm birth and improving neonatal outcomes. Therefore, maintenance tocolysis is not recommended.¹

References:

1. ACOG Practice Bulletin No. 171. Management of Preterm Labor. October 2016 (Reaffirmed 2020).
2. Neilsen JP, West HM, Dowswell T. Betamimetics for inhibiting preterm labour. *Cochrane Database Syst Rev* 2014 Feb 5(2):CD004352. doi: 10.1002/14651858.CD004352.pub3.
3. Crowther CA, Brown J, McKinlay CJ, Middleton P. Magnesium sulphate for preventing preterm birth in threatened preterm labour. *Cochrane Database Syst Rev* 2014 Aug 15;(8):CD001060. doi: 10.1002/14651858.CD001060.pub2.