This care process model (CPM) was developed by Intermountain Healthcare’s Obstetrics (OB) Development Team under the guidance of the Women and Newborns clinical program. It provides evidence-based recommendations for assessing and managing pregnancies affected by preterm premature rupture of membranes (PPROM).

**Why Focus on PPROM?**

Preterm premature rupture of membranes (PPROM) warrants attention for several reasons.

- **It’s common.** PPROM, defined as premature rupture of membranes prior to 37 weeks completed gestation, occurs in 2% to 4% of all singleton and 7% to 20% of twin pregnancies. PPROM is a complication in about one third of all preterm births, which have increased by 38% since 1981. Obstetric providers manage many cases of PPROM over the course of their careers.

- **PPROM in particular is associated with increased morbidity and mortality.** About one-third of women with PPROM develop potentially serious infections. Premature delivery and its attendant potential problems, perinatal infection, and in utero cord compression are common complications. The fetus/neonate is at greater risk of PPROM-related morbidity and mortality than the mother. PPROM accounts for approximately 20% of perinatal deaths in the United States.

- **Practice varies widely.** Successful management of PPROM hinges on accurate knowledge of gestational age and on assessing the relative risks of preterm birth versus expectant management. As understanding of these risks and the factors affecting them evolves, the result will be a reduction of medical practice variability, including delivery timing, medication use, and surveillance practices for expectant management.

- **A systematic evidence- and consensus-based approach will improve outcomes.** See “Goals” at right for key expected benefits of implementing this model.

**WHAT’S INSIDE**

- Algorithm: Management of PPROM
- Assessment and Management Considerations
- Medication Table
- References and Resources

**GOALS**

The overarching goal of this CPM is to promote evidence-based practice and clinical consistency in the management of PPROM within the Intermountain Healthcare system. Specific goals are to:

- Optimize use of resources applied to the assessment and treatment of PPROM
- Help clinicians navigate the risks of preterm labor and expectant management
- Establish a shared approach that can serve as a baseline for measurement and ongoing improvement

**PROGRAM MEASURES**

- Increase corticosteroid (betamethasone) administration given to patients at 24 to 33 weeks 6 days gestation

Indicates an Intermountain measure
ALGORITHM: MANAGEMENT OF PPROM

Patient presents with suspected PPROM

TRANSFER TO L&D as needed, give tocolytic ONLY to allow transport of PPROM patients having labor contractions.

ASSESS for PPROM
Medical history and physical exam, other tests as needed. See Assessment Notes on page 3.

CONFIRM PPROM
Evident intrauterine infection, bleeding sufficient to threaten maternal well-being, or fetal death?

yes → DELIVER expeditiously

no → MANAGE per gestational age as outlined below

Less than 24 weeks
PROVIDE COUNSELING to patient and family.
Gestational age at delivery provides best estimate of chance of survival. If 22 – 24 weeks gestation, recommend consultation with neonatology to discuss resuscitation issues. See page 3 Notes on PPROM.

Per patient choice, either:
• INDUCE labor (refer to Intermountain’s Pregnancy Termination Procedure).
• MANAGE expectantly/MAKE decision to resuscitate (INPATIENT) as described at right.
• MANAGE expectantly/MAKE decision not to resuscitate (OUTPATIENT) as described below.
• CONSIDER inpatient evaluation for 24 to 48 hours and administration of latency antibiotics See Medication Table (page 3).
• DISCHARGE to home with instructions to monitor temperature daily (call if temperature ≥ 100.4°F/38°C).
• PERFORM weekly fetal ultrasound Note that corticosteroids are NOT recommended (see Measures).

If fetus reaches viability and patient and neonatology care team decide to resuscitate infant upon delivery, ADMIT as inpatient AND:

24 weeks – 33 weeks 6 days
MANAGE expectantly (inpatient) as described below.

GIVE magnesium for neuroprotection if delivery at < 32 weeks is expected within 24 hrs
GIVE corticosteroid See Medication Table (page 3).
GIVE antibiotic to prolong latency See Medication Table (page 3).
CONSULT MFM if HSV, HIV, or hepatitis C. If cerclage: LEAVE IN PLACE, unless patient has intrauterine infection or unexplained vaginal bleeding.

PROVIDE surveillance:
• Daily nonstress test to monitor fetal health.
• Periodic (not daily) ultrasound to assess amniotic fluid; if patient no longer reports leakage of fluid, do u/s to check for reaccumulation of fluid suggesting resealing of the rupture. (If resealed, the patient may be discharged home.)

34 weeks or greater
GIVE antibiotic for GBS prophylaxis as needed, following Intermountain’s Prevention of Perinatal GBS guidelines.

GIVE corticosteroid See Medication Table (page 3).

DELIVER (usually by induction of labor)
ASSESSMENT AND MANAGEMENT CONSIDERATIONS

PPROM Assessment

PPROM is a clinical diagnosis usually based on patient history and visualization of amniotic fluid during physical exam. In some cases, lab tests are needed to exclude other possible causes of vaginal or perineal wetness.

- **Medical history:** Timing and quantity of leaking or wetness, weeks gestation / EDD, pregnancy history of PPROM, etc.
- **Physical exam:** Avoid digital exam unless active labor or imminent delivery is expected.
  - Visually inspect for cervicitis, umbilical cord prolapse, or fetal prolapse
  - Assess cervical dilation and effacement
  - Obtain cultures as needed
  - Visually confirm PPROM diagnosis
- **Test:** if diagnosis of PPROM can’t be visually confirmed:
  - Test pH of fluid from posterior vaginal fornix (amniotic fluid usually ~ 7.1 - 7.3, versus vaginal secretions ~ 4.5 - 6)
  - Look for arborization of fluid from posterior vaginal fornix

Consider ultrasound to check amniotic fluid volume; to assess fetal weight, gestational age, and presentation; to check for fetal anatomic abnormality; or to confirm diagnosis of PPROM by guiding transabdominal instillation of indigo carmine dye.

Consider amniotic fluid-specific biomarker test (e.g., AmniSure or ROM Plus) if diagnosis of PPROM remains uncertain after physical examination, nitrazine, and fern tests.

PPROM MANAGEMENT AT < 24 WEEKS GESTATION

Advances in neonatal care and in management of PPROM at the limits of viability may continue to impact survival; nevertheless, for PPROM at < 24 weeks gestation, fetal and neonatal morbidity remain high. Counseling for patients evaluating their choice for termination (induction of labor) or expectant management should include discussion of both maternal and fetal outcomes and, if gestation is 22 to 23 weeks 6 days, should also include a consultation with neonatology.

- For counseling patients at 22 to 24 weeks 6 days, use the Neonatal Research Network Extremely Preterm Birth Outcome Data.
- If induction of labor before viability is considered, refer to Intermountain’s Pregnancy Termination Procedure for guidance in conforming to current Utah and Idaho law.

MEDICATION MANAGEMENT

<table>
<thead>
<tr>
<th>Medication type, use in PPROM</th>
<th>Recommended</th>
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<tbody>
<tr>
<td><strong>Magnesium</strong> for neuroprotection in PPROM &lt;32 weeks when delivery is expected within 24 hours</td>
<td>☐ MAGNESIUM SULFATE, IV: Bolus 6 grams over 40 minutes, then infuse 2 grams/hour maintenance dose from premixed 20 gram/500mL bag until delivery or until 12 hours of therapy. (If preterm delivery seems unlikely after 12 hours of therapy, discontinue therapy).</td>
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<tr>
<td><strong>Corticosteroid</strong> to lower risk of RDS</td>
<td>☐ BETAMETHASONE: 12 mg IM every 24 hours x 2 doses. If betamethasone isn’t available, may use dexamethasone: 6 mg IM every 12 hours x 4 doses. DO NOT GIVE if &gt; 34 weeks and patient has previously received betamethasone.</td>
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<tr>
<td><strong>Antibiotics</strong> to prolong latency (Options listed at right will provide GBS coverage for 48 hours. If delivery is expected after 48 hours and before completion of antibiotics used to prolong latency, follow Intermountain’s Prevention of Perinatal GBS guidelines)</td>
<td>☐ AMPICILLIN 2 grams IV every 6 hours and erythromycin 250 mg IV every 6 hours x 48 hours followed by: AMOXICILLIN 250 mg PO every 8 hours for 5 days and ERYTHROMYCIN 333 mg PO every 8 hours for 5 days. If penicillin allergy, low risk (e.g., isolated macupapular rash without urticaria or pruritis): ☐ cefazolin 1 gram IV every 8 hours x 48 hours and erythromycin 250 mg IV every 6 hours x 48 hours followed by: cephalaxin 500 mg PO every 6 hours x 5 days and erythromycin 333 mg PO every 8 hours x 5 days If penicillin allergy, high risk (e.g., anaphylaxis, angioedema, respiratory distress, urticaria): ☐ vancomycin 1 gram IV every 12 hours x 48 hours and erythromycin 250 mg IV every 6 hours x 48 hours followed by: clindamycin 300 mg PO every 8 hours x 5 days and erythromycin base 333 mg PO every 8 hours x 5 days</td>
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RESOURCES

For Providers:

This CPM and other related resources (below) are accessible through the Clinical Programs Care Process Models page on intermountainphysician.org or the Women & Newborns Clinical Program home page on intermountain.net.

- Magnesium Sulfate Neurophrophylaxis for the Very Preterm Infant Guideline
- Prevention of Perinatal GBS Disease in Labor
- Preterm Birth (Spontaneous and Indicated) CPM

Patient Education Fact Sheets:

Clinicians can view or order Intermountain patient education materials for distribution to their patients.

- View by opening the appropriate topic page via the Clinical Programs pages on intermountain.net or intermountainphysician.org.
- Order from Intermountain’s iprintstore.org.

Intermountain PPROM-related patient materials include the following:

- 17P for Preventing Preterm Birth
- Preterm Birth: 10 Steps to Help Prevent It

BIBLIOGRAPHY


REFERENCES


