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Text in blue in this algorithm indicates a linked corresponding annotation.
Management of Signs/Symptoms of Preterm Labor (PTL) Algorithm

This algorithm applies to singleton pregnancies only.

Text in blue in this algorithm indicates a linked corresponding annotation.

Assessment includes:
- Sterile speculum exam
- Fetal fibronectin testing
- Consider GBS, wet prep for bacterial vaginosis
- GC, chlamydia
- Digital cervical exam
- Transvaginal ultrasound for cervical length (if available)
- Ultrasound for growth, fluid, placenta
- Assess contraction patterns
- Assess fetal well-being
- Urinalysis and urine culture

Critical events:
- Cervix 5+ cm dilated
- pPROM
- Vaginal bleeding
- Chorioamnionitis suspected

Assessment of patient with signs/symptoms of possible PTL

Patient and fetus both medically stable?

Is there a critical event?

Cervix > 2 cm dilated, > 80% effaced, contractions 4/20 or 6/60?

Ultrasound cervical length < 3.0 cm or fFn positive?

Monitor for minimum 2 hours for cervical changes

Cervical change?

Consider antenatal corticosteroids
Dismiss and schedule follow-up

See ICSI Routine Prenatal Care guideline

See Management of Critical Event algorithm

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Management of Critical Event Algorithm

Patient has critical event

Cervix 5+ cm dilated?

Chorioamnionitis suspected?

Antenatal corticosteroids 23-34 weeks

Immediate dose antenatal corticosteroids STAT, IV antibiotics for group B streptococcus (GBS)

Consider magnesium sulfate for neuroprotection

Is delivery imminent?

Prepare for preterm delivery/transport

Neonatal consult

Stabilize on tocolytics

Transfer mother to appropriate level of care if possible

Deliver for:
- Fetal distress
- Chorioamnionitis
- Active labor
- 34 weeks PROM
- Other obstetrical indicators

Await spontaneous labor

Sonogram for:
- Amniotic fluid index (AFI)
- Presentation/placenta
- Follow-up level II as indicated

Sonogram detects gross abnormality?

Fetal anomaly compatible with life?

Management of preterm labor with bleeding

Vaginal bleeding?

Vaginal pool + amniocentesis at 32+ weeks for fetal lung maturity (FLM)

Fetal lung maturity (FLM) study positive?

Preterm delivery

Disseminated intravascular coagulation (DIC)

FLM

Fetal distress

Non-reassuring FHT

Significant bleeding

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Vaginal Birth After Caesarean (VBAC) Algorithm

57 Patient in active labor with previous uterine incision

58 Special considerations of labor management

59 Vaginal birth appropriate for planned VBAC?
   - yes
   - no
   - Repeat Caesarean delivery

58 Patient has made an informed choice to have planned VBAC
   - Availability of Caesarean delivery team
   - Determine previous uterine incision and review prior op report if available
   - EFM and intermittent auscultation
   - Use of foley bulb catheter for cervical ripening

60 Normal labor?
   - yes
   - no

62 Vaginal birth

61 Complicated labor management

61 Signs and symptoms of uterine rupture:
   - Fetal distress
   - Uterine pain
   - Hemorrhage
   - Palpation of fetal parts
   - Loss of contraction
   - Recession of presenting part
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- Possible interventions:
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  - Amniotomy/IUPC
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  - Oxytocin augmentation
  - Evaluate passenger and passageway
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68
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70
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- Consider assisted delivery
- Evaluate passenger and passageway
- Consider OB/surgery consult

76
Is the head descending?

77
Assisted vaginal delivery indicated?

78
Assisted vaginal delivery

Text in blue in this algorithm indicates a linked corresponding annotation.

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Intrapartum Fetal Heart Rate (FHR) Management Algorithm

Text in blue in this algorithm indicates a linked corresponding annotation.

Concern about fetal heart rate

Continuous EFM-ext or EFM-int (if needed)

Consider amnioinfusion for oligohydramnios and severe variable or prolonged decelerations

FHR pattern is predictive of normal acid-base status?

Assessment and intrauterine resuscitation

FHR pattern predictive of normal acid-base status now?

Expedited vaginal delivery

Vaginal delivery imminent?

Further FHR assessment predictive of normal acid-base status?

Emergent delivery

See algorithm #13, “Any concerns or complications?”
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Evidence Grading

Literature Search

A consistent and defined process is used for literature search and review for the development and revision of ICSI guidelines. The literature search was divided into two stages to identify systematic reviews, (stage I) and randomized controlled trials, meta-analysis and other literature (stage II). Literature search terms used for this revision include partograms, induction of labor, expectant management of labor, cervical ripening, active management of labor and oxytocin – from January 2011 through October 2012.

GRADE Methodology

Following a review of several evidence rating and recommendation writing systems, ICSI has made a decision to transition to the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system. GRADE has advantages over other systems including the current system used by ICSI. Advantages include:

- developed by a widely representative group of international guideline developers;
- explicit and comprehensive criteria for downgrading and upgrading quality of evidence ratings;
- clear separation between quality of evidence and strength of recommendations that includes a transparent process of moving from evidence evaluation to recommendations;
- clear, pragmatic interpretations of strong versus weak recommendations for clinicians, patients and policy-makers;
- explicit acknowledgement of values and preferences; and
- explicit evaluation of the importance of outcomes of alternative management strategies.

This document is in transition to the GRADE methodology

Transition steps incorporating GRADE methodology for this document include the following:

- Priority placed upon available Systematic Reviews in literature searches.
- All existing Class A (RCTs) studies have been considered as high quality evidence unless specified differently by a work group member.
- All existing Class B, C and D studies have been considered as low quality evidence unless specified differently by a work group member.
- All existing Class M and R studies are identified by study design versus assigning a quality of evidence. Refer to Crosswalk between ICSI Evidence Grading System and GRADE.
- All new literature considered by the work group for this revision has been assessed using GRADE methodology.

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Crosswalk between ICSI Evidence Grading System and GRADE

<table>
<thead>
<tr>
<th>ICSI GRADE System</th>
<th>Previous ICSI System</th>
</tr>
</thead>
<tbody>
<tr>
<td>High, if no limitation</td>
<td>Class A: Randomized, controlled trial</td>
</tr>
<tr>
<td>Low</td>
<td><strong>Class B:</strong> [observational] Cohort study</td>
</tr>
<tr>
<td>Class C: [observational] Non-randomized trial with concurrent or historical controls</td>
<td>Low Case-control study</td>
</tr>
<tr>
<td>Low Population-based descriptive study</td>
<td>Low Study of sensitivity and specificity of a diagnostic test</td>
</tr>
<tr>
<td><em>Low Study of sensitivity and specificity of a diagnostic test</em></td>
<td><em>Following individual study review, may be elevated to Moderate or High depending upon study design</em></td>
</tr>
<tr>
<td>Class D: [observational] Cross-sectional study</td>
<td>Low</td>
</tr>
<tr>
<td>Case series</td>
<td>Case report</td>
</tr>
<tr>
<td>Meta-analysis</td>
<td>Class M: Meta-analysis Systematic review Decision analysis Cost-effectiveness analysis</td>
</tr>
<tr>
<td>Systematic Review</td>
<td>Low Consensus statement</td>
</tr>
<tr>
<td>Decision Analysis</td>
<td>Low Consensus report</td>
</tr>
<tr>
<td>Cost-Effectiveness Analysis</td>
<td>Low Narrative review</td>
</tr>
<tr>
<td>Guideline</td>
<td>Class R: Guideline</td>
</tr>
<tr>
<td>Low</td>
<td>Class X: Medical opinion</td>
</tr>
</tbody>
</table>

Evidence Definitions:

**High Quality Evidence** = Further research is very unlikely to change our confidence in the estimate of effect.

**Moderate Quality Evidence** = Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

**Low Quality Evidence** = Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate or any estimate of effect is very uncertain.

In addition to evidence that is graded and used to formulate recommendations, additional pieces of literature will be used to inform the reader of other topics of interest. This literature is not given an evidence grade and is instead identified as a Reference throughout the document.

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Foreword

Scope and Target Population

All women who present in labor.

Aims

1. Increase the percentage of patients with preterm labor of less than 34 weeks who receive antenatal corticosteroids. (Annotations #35, 43, 48)

2. Increase the percentage of patients who have procedures done that assist in progress to vaginal birth. (Annotations #12, 67)

3. Increase the percentage of patients who are assessed for risk status on entry to labor and delivery. (Annotation #13)

4. Increase the percentage of patients who have intrauterine resuscitation techniques for fetal tachysystole or Category III heart rate tracings. (Annotation #84)

Clinical Highlights

• Patients should be assessed for labor or rupture of membranes before being admitted.
  - Labor is defined as regular uterine contractions that are causing cervical effacement and dilation and the cervix is dilated at least 3 cm.
  - Rupture of membranes can be confirmed by checking for pooling and ferning, a nitrazine test or with a commercially available indicator such as AmniSure. (Annotation #5)

• Assess fetal well-being with either intermittent auscultation or continuous electronic fetal heart rate monitoring. (Annotation #12)

• Assess patient's level of risk on presentation. (Annotation #13; Aim #3)

• Initiate treatment for preterm labor as soon as possible after the diagnosis is established. (Annotation #21; Aim #1)

• Women with preterm labor at appropriate gestational age should receive a course of antepartum steroids to promote fetal lung maturity. (Annotations #35, 43, 48; Aim #1)

• Active labor is defined as 6 cm or greater of cervical dilation. (Annotation #64)

• Conduct regular cervical checks (cervical checks afford best opportunity to detect labor progress and prevent failure to progress). (Annotation #66)

• Augment with oxytocin to achieve adequate labor for two to four hours for protracted Stage I labor. (Annotation #67)

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• If patient is in Stage II labor and is not making progress, initiate management of protraction disorders (positioning, oxytocin augmentation, OB/surgical consult). *(Annotation #75; Aim #2)*

• When necessary, discontinue oxytocin and initiate intrauterine resuscitation such as maternal position, cervical exam for cord prolapse, monitoring maternal blood pressure, assessment for uterine hyperstimulation and amnioinfusion. *(Annotation #84; Aim #4)*

• Recognize and manage fetal heart rate abnormal patterns. *(Annotation #82; Aim #4)*

**Related ICSI Scientific Documents**

**Guideline**

- Routine Prenatal Care

**Definition**

**Clinician** – All health care professionals whose practice is based on interaction with and/or treatment of a patient.

**Abbreviations Used in This Guideline**

- **fFN** fetal fibronectin
- **FHR** fetal heart rate
- **FLM** fetal lung maturity
- **GBS** group B streptococcus
- **PROM** premature rupture of membranes
- **pPROM** preterm premature rupture of membranes
- **PTL** preterm labor
- **VBAC** vaginal birth after Caesarean
Algorithm Annotations

The recommendations in this guideline are supported by large controlled studies. The guideline work group would prefer to refer to double-blind studies, but it is not feasible to blind a woman to whether she is having labor or delivery. It is unsafe to blind care clinicians to whether a woman has had a previous Caesarean delivery or not or previous labor and delivery complications. It is also unsafe to blind clinicians to whether persistent non-reassuring heart rate tracings have occurred. Given these limitations, the work group feels confident of the literature support for the recommendations within this guideline. Furthermore, these recommendations are consistent with the latest practice patterns published by the American College of Obstetricians and Gynecologists.

Management of Labor Main Algorithm Annotations

2. Triage for Symptoms of Labor

Hospital and/or clinic triage for the labor patient will include these questions. Triage staff will assess general questions from OB experience. Some questions may require more details for assessment. Generally, the patient is encouraged to remain home as long as possible. The caregiver will manage any/all medical concerns according to accepted standards.

General Questions:

- Are you having contractions?
- Is this your first baby?
- Was your cervix dilated at least 2-3 cm on your last office visit?
- Did you have medical complications during your pregnancy? Get specifics.
- Are you at term? (What is your estimated date of conception?)

Specific Questions:

- Is your baby moving as usual?
  - If no, advise go to hospital.
- Has your water broken?
  - If yes, advise go to hospital.
- Are you bleeding?
  - If yes, advise go to hospital.
- Are you having unbearable contractions?
  - If yes, advise go to hospital.

Return to Algorithm   Return to Table of Contents
5. Admit for Labor?

Labor is defined as:

Spontaneous contractions at least 2 per 15 minutes and at least two of the following:

- Complete effacement of cervix
- Cervical dilation 3 cm or greater (cervical exam #1)
- Other cervical changes
- Spontaneous rupturing of membrane (SROM)
  - Rupture of membranes can be confirmed by checking for pooling and ferning, a nitrazine test or with a commercially available indicator such as AmniSure.

Only patients who meet this definition of labor should be admitted for careful management of labor. Careful assessment of presenting patients is critical.

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7. Patient Education for Reassurance/Observe and Reevaluate/Consider Labor Induction if Appropriate

When a patient presents to hospital, and assessment shows the patient is NOT in labor, patient education will include signs to look for, changes to assess, and reassurance that she can come back to the hospital when changes occur. When the caregiver prefers to hold and observe the patient, a reassessment must be conducted prior to release from the hospital.

In 2006, approximately one in five labors was induced in the United States. This rate has doubled since 1990 and is thought to be responsible, at least in part, for the increased Caesarean section rate, which is currently 32% in the United States (American College of Obstetricians and Gynecologists, The, 2009a [Guideline]). There are numerous circumstances that could warrant induction of labor. Broadly, such circumstances are divided into two categories: medical and elective. These categories are discussed in turn.

Medical Inductions

Medical inductions are considered for indications in which delivery is judged to be of lesser risk to maternal or fetal health than continuation of the pregnancy. Some of those indications include gestational hypertension, pre-eclampsia, eclampsia, placental abruption, premature rupture of membranes, post-term pregnancy, diabetes mellitus, renal disease, antiphospholipid syndrome, chorioamnionitis, oligohydramnios and fetal growth restriction. This list is not comprehensive and other factors, though not strictly medical, may be a consideration, too.

Elective Inductions

Elective deliveries are deliveries initiated without a specific medical indication. These include elective inductions of labor (IOLs) and elective Caesarean deliveries (primary or repeat). Elective IOLs are frequently performed for patient or clinician convenience, although other psychological factors may be involved. The most common reason for an elective Caesarean delivery is a repeat Caesarean.

Induction Decision-Making

While the decision to perform an induction rests with patient and her clinician, there are important considerations and outcomes that should be included as part of this decision. For each case, the risks to the fetus for delivery at the current gestational age (timing of induction), the condition of the cervix (cervical favorability), and the clinician's assessment of the risk to the fetus and mother in continuing the pregnancy (list
of medical indications), must be weighed in deciding on timing and mode of delivery. See Appendix A, "ICSI Shared Decision-Making Model."

**Timing of Induction**

Although "term" is generally considered after 37 weeks, there is a substantial body of evidence that delivery prior to 39 completed weeks gestation is associated with increased fetal morbidity such as low Apgars and respiratory distress syndrome (Engle, 2008 [Low Quality Evidence]). Because of these risks, ACOG guidelines for elective IOL and elective Caesarean delivery include confirmation that the pregnancy is at least 39 weeks gestation by one of the following dating criteria:

- Ultrasound measurement at less than 20 weeks of gestation supports gestational age of 39 weeks or greater.
- Fetal heart tones have been documented as present for 30 weeks by Doppler ultrasonography.
- It has been 36 weeks since a positive serum or urine human chorionic gonadotropin pregnancy test result.

One exception to the rule has been documented: fetal lung maturity if elective delivery is planned prior to 39 weeks. However, recent evidence suggests that even fetuses with documented fetal lung maturity prior to 39 weeks gestation have greater risk of adverse outcomes (Bates, 2010 [Low Quality Evidence]). There are also risks associated with post-dates pregnancies; the question of when to induce is still unclear (Stock, 2012 [Low Quality Evidence]).

**Cervical Favorability**

With an elective IOL, the goal is to effect a vaginal delivery, so the likelihood of a successful vaginal delivery becomes an important consideration. In 1968, Bishop, using a cervical scoring system that bears his name, evaluated multiparous women induced with oxytocin and found that women with a cervical score > 8 had a 95% chance of a vaginal delivery. Since that hallmark study, numerous studies have assessed factors that impact IOL outcomes, and several have shown that nulliparous women with an unfavorable cervix (Bishop score 5 or less) have double the risk of a Caesarean delivery (Jonsson, 2012 [Low Quality Evidence]; Vahratian, 2005 [Low Quality Evidence]; Vrouenraets, 2005 [Low Quality Evidence]).

**Contraindications to Elective IOL**

An elective IOL should not be attempted for any women in whom a vaginal delivery would be contraindicated, including transverse fetal lie, placenta previa, vasa previa, active genital HSV infection, prior classical Caesarean section and umbilical cord prolapse.

**Timing of Delivery When Conditions Complicate Pregnancy**

This list is not comprehensive, and other factors in individual cases may be important. The weeks listed are the suggested minimum gestational age of an expert consensus group (Spong, 2011 [Guideline]). The numbers listed indicate completed weeks. For example, 36 weeks means 36 weeks and 0 days to 36 weeks and six days. This list is grouped by category of indication for induction.

**Placental and uterine**

- Placenta previa: 36-37 weeks
- Suspected accreta with previa: 34-35 weeks
- Prior classical Caesarean section: 36-37 weeks
- Prior myomectomy necessitating Caesarean section: 37-38 weeks
<table>
<thead>
<tr>
<th>Category</th>
<th>Condition</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fetal</strong></td>
<td>Fetal growth restriction, otherwise uncomplicated singleton</td>
<td>38-39 weeks</td>
</tr>
<tr>
<td></td>
<td>Fetal growth restriction, with concurrent conditions</td>
<td>34-37 weeks</td>
</tr>
<tr>
<td></td>
<td>Twins, dichorionic/diamniotic</td>
<td>38 weeks</td>
</tr>
<tr>
<td></td>
<td>Twins, monochorionic/diamniotic</td>
<td>34-37 weeks</td>
</tr>
<tr>
<td></td>
<td>Oligohydramnios, isolated and persistent</td>
<td>36-37 weeks</td>
</tr>
<tr>
<td><strong>Maternal</strong></td>
<td>Chronic hypertension, controlled on medication</td>
<td>37-39 weeks</td>
</tr>
<tr>
<td></td>
<td>Gestational hypertension</td>
<td>37-38 weeks</td>
</tr>
<tr>
<td></td>
<td>Mild pre-eclampsia</td>
<td>37 weeks</td>
</tr>
<tr>
<td></td>
<td>Severe pre-eclampsia</td>
<td>At time of diagnosis</td>
</tr>
<tr>
<td></td>
<td>Pre-gestational diabetes mellitus, well-controlled</td>
<td>IOL not recommended</td>
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<td></td>
<td>Pre-gestational diabetes mellitus, poorly controlled</td>
<td>34-39 weeks</td>
</tr>
<tr>
<td></td>
<td>Gestational diabetes mellitus, well-controlled</td>
<td>IOL not recommended</td>
</tr>
<tr>
<td></td>
<td>Gestational diabetes mellitus, poorly controlled</td>
<td>34-39 weeks</td>
</tr>
<tr>
<td><strong>Obstetric</strong></td>
<td>Prior stillbirth</td>
<td>IOL not recommended</td>
</tr>
<tr>
<td></td>
<td>Premature rupture of membranes</td>
<td>At or after 34 weeks</td>
</tr>
<tr>
<td><strong>Elective</strong></td>
<td></td>
<td>39 weeks</td>
</tr>
</tbody>
</table>

*While there are no documented long-term risks to the fetus associated with elective deliveries, there is clear potential for harm and increased cost. The decision to consider an elective IOL should involve an informed consent discussion including the risks of prolonged labor and possible Caesarean section. This should be documented in the patient record before proceeding (Bates, 2010 [Low Quality Evidence]; American College of Obstetricians and Gynecologists The, 2009a [Guideline]; Engle, 2008 [Low Quality Evidence]; Vrouenraets, 2005 [Low Quality Evidence]). See Appendix A, "ICSI Shared Decision-Making Model."
12. Intrapartum Care

See the ICSI Admission for Labor Management order set.

Characteristics of care for a patient at time of admission to labor and delivery include:

- Acquisition and evaluation of current medical records
- Cervical exam #2
- Appropriate supportive care/comfort measures as per individual clinician. May include but are not limited to PO fluids, fluid balance maintenance, position changes, back rubs, music, ambulation, and tub bath/shower. Management of labor using patient care measures and comfort measures is supported. Documentation of progress of labor using a graphic medium is helpful to patient and staff (Radin, 1993 [Low Quality Evidence]; McNiven, 1992 [Low Quality Evidence]).
- Adequate pain relief. This includes parenteral analgesics, e.g., fentanyl, nalbuphine hydrochloride (such as Nubain) or hydroxyzine hydrochloride (such as Vistaril), or epidural or intrathecal opioids for patients in active progressing labor (continued dilation of the cervix) (Rogers, 1999 [Low Quality Evidence]; Clark, 1998 [High Quality Evidence]; Halpern, 1998 [Meta-analysis]).
- Documentation of progress of labor using a graphic medium (partogram) is started on admission.
- In nulliparous patients, early amniotomy is a component in the active management of labor protocol and has been shown to reduce the duration of labor (Smyth, 2013 [Systematic Review]; Fraser, 1993 [High Quality Evidence]).

Contraindications for amniotomy include:

- Presentation unknown, floating or unstable
- Cervix dilated less than 3 cm
- Patient refuses

Continuous Electronic Fetal Heart Rate Monitoring or Intermittent Auscultation

The established purpose of fetal heart rate (FHR) monitoring is to identify fetal hypoxemia and acidemia so timely intervention can prevent fetal morbidity and mortality. This is based on the rationale that FHR patterns are indirect markers for hypoxemia and acidemia since the central nervous system controls heart rate. For more information on FHR patterns, see table in Annotation #82, "FHR Pattern Is Predictive of Normal Acid-Base Status?"

Virtually all obstetrical organizations advise monitoring the FHR during labor, although no trials have compared FHR monitoring to no monitoring (Freeman, 2002 [Low Quality Evidence]). The most common methods of FHR monitoring are continuous electronic FHR monitoring (EFM) and intermittent auscultation. EFM can be done with an external cardiotocography monitor or an internal (scalp) lead and can provide a continuous assessment of FHR variability and any changes from the baseline heart rate (see Table 1 for electronic fetal monitoring definitions). Intermittent auscultation consists of auscultating FHR with either a DeLee stethoscope or a Doppler probe for 30 seconds immediately following a contraction. This monitoring must be performed every 30 minutes during Stage I of labor and every 15 minutes during Stage II (American College of Obstetrics and Gynecologists, The, 2010b [Guideline]; American College of Obstetrics and Gynecologists, The, 2009b [Guideline]).
Analysis of data from randomized trials comparing these two techniques shows:

- No difference in the rate of intrapartum fetal death rate (approximately 0.5 per 1,000 births with either approach)
- No difference in Apgar scores and NICU admissions
- Neither approach has resulted in a reduction in cerebral palsy or incidence of infant neurologic impairment

Several advantages of EFM have been demonstrated, including a reduction in neonatal seizures (Alfirevic, 2006 [Systematic Review]) and better prediction of fetal acidemia at birth (Vintzileos, 1995 [Meta-analysis]; Vintzileos, 1993 [High Quality Evidence]). One disadvantage of EFM is that it leads to higher assisted deliveries and Caesarean birth without an associated neonatal benefit (Alfirevic, 2006 [Systematic Review]). Compared to intermittent auscultation, EFM is associated with a twofold increase in Caesarean delivery rate for non-reassuring FHR patterns.

13. Any Concerns or Complications?

Risk assessment should be performed on all patients in active labor and is the responsibility of all members of the health care team. This includes but is not limited to nurses, midwives and physicians. (See Annotation #5, "Admit for Labor?" for specific definition.)

Initial assessments on entry into labor and delivery area:

- Fetal heart rate assessment (Cheyne, 2003 [High Quality Evidence]; Impey, 2003 [High Quality Evidence])
- Patient assessment
- Prenatal risk review
- Risk in labor assessment

High-risk situations may include any of the following conditions:

- Abnormal fetal heart rate (see Intrapartum Fetal Heart Rate [FHR] Monitoring algorithm and annotations)
- Situations that involve arrest or protraction disorders (see Management of Labor Dystocia algorithm and annotations)
- Bleeding
- Breech presentation
- Dysfunctional labor
- Fetal congenital heart disease
- Intrauterine growth restriction
- Maternal congenital heart disease
- Maternal diabetes
- Gestational diabetes
- Maternal hypertension
15. Management of Third Stage of Labor

Active management of the third stage of labor should be offered to women since it reduces the incidence of postpartum hemorrhage due to uterine atony. Active management of the third stage of labor consists of interventions designed to facilitate the delivery of the placenta by increasing uterine contractions and to prevent postpartum hemorrhage by averting uterine atony. The usual components include:

- administration of uterotonic agents,
- controlled cord traction, and
- uterine massage after delivery of the placenta, as appropriate.

(Begley, 2011 [Low Quality Evidence]; International Confederation of Midwives, 2004 [Low Quality Evidence]; Elbourne, 2001 [Systematic Review])

Management of Signs/Symptoms of Preterm Labor (PTL)

21. Assessment of Patient with Signs/Symptoms of Possible Preterm Labor

Be certain intervention is appropriate, including certainty of gestational age. A sonogram should be considered if one has not been done.

A thorough medical evaluation should include the following:

- Perform a sterile speculum exam to visualize the cervix to:
  - identify any source of bleeding or cervical or vaginal pathology or trauma;
  - estimate dilation and effacement of the cervix and look for pooling of amniotic fluid as a sign of ruptured membranes; and
  - obtain samples for fetal fibronectin testing (fFN)*, consider samples for gonorrhea, chlamydia, (Andrews, 2000 [Low Quality Evidence]) wet prep for bacterial vaginosis**, group B streptococcus (GBS), and a sample for detecting amniotic fluid with either ferning, nitrazine paper or Amnisure.

* Perform fetal fibronectin testing (fFN) if patient is between 24 and 33 weeks gestation and cervix is less than 3 cm dilated. A negative fFN result was associated with a 97.4% likelihood of the pregnancy continuing more than seven days after testing (Skoll, 2006 [Low Quality Evidence]).

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• Perform digital cervical exam if membranes are intact and there is no vaginal bleeding. If ruptured, digital exams increase the risk of infection.

• Obtain transvaginal sonogram (TVS) for cervical length for monitoring of patients with sign/symptoms of preterm labor and early cervical change. Cervical length of less than 3.0 cm or a rapidly thinning cervix correlate with increased preterm birth rates (Rose, 2010 [Low Quality Evidence]; Iams, 2003 [Low Quality Evidence]; Vendittelli, 2000 [Low Quality Evidence]).

• Perform bedside ultrasound (if feasible) to assess:
  - Presentation
  - Amniotic fluid index
  - Biophysical profile
  - Estimated fetal weight

• Assess contraction pattern

• Assess fetal heart rate pattern and fetal well-being

• Obtain urinalysis, urine culture and urine drug screen (if appropriate)

Consider non-intervention near-term if gestational age is well documented. Do not inhibit labor where there is fetal or maternal jeopardy, fetal malformation or death.

**Definition of Preterm Labor:**

• Labor occurring after 20 and before 37 completed weeks **plus**

• Clinically documented uterine contractions (4/20 minutes or 6/60 minutes) **plus**

• Ruptured membranes **or**

• Intact membranes and cervical dilation greater than 2 cm **or**

• Intact membranes and cervical effacement greater than 80% **or**

• Intact membranes and cervical change during observation. These can be measured by changes in dilation or effacement, or by changes in cervical length measured clinically or by ultrasound.

**Management of Critical Event Algorithm Annotations**

A pregnant woman whose labor begins early (before 37 weeks gestation) may experience a tremendous amount of anxiety and fear, not knowing or understanding the risks to the baby and herself. She will have many questions and concerns. It is imperative that the clinicians caring for the mother and unborn baby communicate with the patient and other family members often and in terms they can understand.

**35. Initial Dose Antenatal Corticosteroids STAT, IV Antibiotics for Group B Streptococcus (GBS)**

Please refer to Annotation #48, "Initiate Tocolytics, Antenatal Corticosteroids and Antibiotic Group B Streptococcus (GBS) Prophylaxis," for information on dosing of other corticosteroids.
36. Consider Magnesium Sulfate for Neuroprotection

The work group consensus is that use of magnesium sulfate for the purpose of neuroprotection may be beneficial for gestational age 32 weeks or less.

Several randomized controlled trials (Marret, 2007 [High Quality Evidence]; Rouse, 2008 [High Quality Evidence]) have evaluated the administration of magnesium sulfate in clinical situations when preterm delivery is regarded as imminent. Review of these trials has suggested magnesium sulfate does not work well as a tocolytic, but does provide a reduction in both the frequency and severity of cerebral palsy for those infants surviving the immediate intrapartum time frame (American College of Obstetricians and Gynecologists, The, 2010a [Guideline]; Doyle, 2009 [Low Quality Evidence]). The term "neuroprotection" is used to describe the possible indication for magnesium sulfate in these clinical situations. The following points from these studies are important to note:

- Very preterm birth (less than 34 weeks) and very low birth weight (less than 1,500 g) are principal risk factors for cerebral palsy, making up between 17 and 32% of all cases of cerebral palsy.
- Evidence from population-based registries shows the prevalence of cerebral palsy is rising in very low birth weight infants.
- Recent retrospective studies confirm that the increasing prevalence of cerebral palsy is from higher rates in preterm, not term, infants.

The most adequately powered United States randomized controlled trial (Rouse, 2008 [High Quality Evidence]) showed no difference in the primary composite outcome of stillbirth or infant death by one year of age of or moderate or severe cerebral palsy between the magnesium sulfate group and the placebo group (11.3% and 11.7%, RR 0.97, 95% CI 0.77-1.23). However, a secondary analysis did show a decreased rate of moderate or severe cerebral palsy in the magnesium sulfate group in infants < 28 weeks gestation at randomization (1.9% vs. 3.5% placebo; RR 0.55; 95% CI 0.32-0.95).

A meta-analysis involving individual patient data from five randomized controlled trials (n=5,235 fetuses/infants) demonstrated a reduction in cerebral palsy (RR 0.70, 95% CI 0.55-0.89) and moderate-severe cerebral palsy (RR 0.60, 95% CI 0.43-0.84), but not a reduction in the rate of death or cerebral palsy (RR 0.92, 95% CI 0.83-1.03) with in utero exposure to magnesium sulfate. There was no evident increase in the risk of death (RR 1.01, 95% CI 0.89-1.14) (Costantine, 2009 [Meta-analysis]).

38. Stabilize on Tocolytics/Transfer Mother to Appropriate Level of Care if Possible

Several medications are available for the inhibition of preterm labor (tocolysis). These drugs have different routes of administration, dose schedules, safety profiles, contraindications, and fetal and maternal side effects (Simhan, 2007 [Low Quality Evidence]). Although several medications can prevent delivery for 24-48 hours (allowing time for the administration and beneficial effects of corticosteroid therapy), the longer-term efficacy of all tocolytics is poor (Gyetvai, 1999 [Systematic Review]).

**Calcium channel blockers**

Nifedipine is the drug most commonly employed from this class of medications for tocolysis. No placebo-controlled trials have evaluated the drug for this indication, but comparative trials have demonstrated the efficacy and safety of the drug (King, 2003 [Systematic Review]; Papatsonis, 1997 [High Quality Evidence]).

**Beta-adrenergic-receptor agonists**

Terbutaline is one of the commonly employed drugs from this class of medications for tocolysis. Available studies show a prolongation of pregnancy similar to the results of calcium channel blockers, but no significant reduction in perinatal morbidity or mortality (Anotayanonth, 2004 [Systematic Review]). However,
the U.S. Food and Drug Administration (FDA) notified health care professionals that oral and injectable terbutaline should not be used in pregnant women for prolonged treatment (beyond 48-72 hours) of preterm labor because of the potential for serious maternal heart problems and death: http://www.fda.gov/Safety/MedWatch/SafetyInformation/SafetyAlertsforHumanMedicalProducts/ucm243843.htm.

**Cyclooxygenase inhibitors**

Indomethacin is the drug most commonly employed from this class of medications for tocolysis. A meta-analysis of three comparative trials with other classes of tocolytics showed a reduction of preterm births (< 37 weeks) (King, 2005 [Systematic Review]). Indomethacin should be used only at less than 32 weeks gestation and only for 48 hours maximum to allow for the administration of antenatal corticosteroids (Doyle, 2005 [Low Quality Evidence]; Loe, 2005 [Systematic Review]).

**Magnesium sulfate**

Review of the literature does not support the efficacy of magnesium sulfate as a tocolytic. The largest randomized, placebo-controlled trial showed no benefit over placebo (Cox, 1990 [High Quality Evidence]). A more recent meta-analysis of 11 studies showed no benefit regarding the risk of preterm birth (less than 37 weeks) or very preterm birth (less than 34 weeks). Moreover, in seven of the trials analyzed, the risk of perinatal mortality was increased for infants exposed to magnesium sulfate (Grimes, 2006 [Low Quality Evidence]; Crowther, 2002 [Systematic Review]; Mittendorf, 2002 [Low Quality Evidence]). The work group does not recommend the use of this medication for this indication.

**Maternal Transfer**

Maternal transfer to prevent the need for premature neonatal transfer reduces preterm neonatal morbidity and mortality. Very low birth weight infants (less than 1,500 grams) inborn to Level III perinatal centers have lower mortality, reduced incidence of Grade III and Grade IV intraventricular hemorrhage, and lower sensorineural disability rates than outborn infants (Towers, 2000 [Low Quality Evidence]; Menard, 1998 [Low Quality Evidence]; Yeast, 1998 [Low Quality Evidence]).

**41. Broad Spectrum Antibiotics/Plan for Delivery**

Broad-spectrum antibiotic coverage appears to lengthen the latency from preterm premature rupture of membranes (pPROM) until delivery and/or chorioamnionitis. Antibiotic therapy reduces maternal and neonatal morbidity in women with pPROM. There is no consensus on the choice of antibiotic or dose. A combination of ampicillin and erythromycin is considered protocol in some organizations (Bar, 2000 [Low Quality Evidence]; Edwards, 2000 [Low Quality Evidence]; Kenyon, 2001 [Systematic Review]; Mercer, 1997 [High Quality Evidence]).

See Annotation #38, "Stabilize on Tocolytics/Transfer Mother to Appropriate Level of Care if Possible," for a discussion about tocolytics.

**42. Stabilize on Tocolytics/Transfer Mother to Appropriate Level of Care if Possible**

Please refer to Annotation #48, "Initiate Tocolytics, Antenatal Corticosteroids and Antibiotic Group B Streptococcus (GBS) Prophylaxis," for dosing of betamethasone and other corticosteroids.
48. Initiate Tocolytics, Antenatal Corticosteroids and Antibiotics for Group B Streptococcus (GBS) Prophylaxis

Agents to be considered for tocolytic therapy include terbutaline sulfate, indomethacin and nifedipine. In February 1997, the FDA alerted practitioners to use caution in the continuous subcutaneous administration of terbutaline sulfate. As noted in Annotation #38, review of available studies does not support using magnesium sulfate for tocolysis, although it may be considered for neuroprophylaxis in pregnancy to 32 weeks gestation. See Annotation #36, "Consider Magnesium Sulfate for Neuroprotection."

See Annotation #38, "Stabilize on Tocolytics/Transfer Mother to Appropriate Level of Care if Possible," for a detailed discussion of particular tocolytics.

Other considerations for initial management of preterm labor include the following:

- Initiate antenatal corticosteroids if 23-34 weeks gestation. Please refer below to "Pharmacologic Management of Preterm Labor" for more information on administration of betamethasone and other corticosteroids.
- Administer IV antibiotic effective against group B streptococcus (GBS) until GBS results are back or if patient is known to be positive for GBS (Thorp, 2002 [Low Quality Evidence]).
- Consider IV magnesium sulfate therapy for neuroprophylaxis if 23-32 weeks gestation.
- Activity limitation as indicated.
- Order additional laboratory analysis pertinent to tocolytic being used.

Pharmacologic Management of Preterm Labor

A. Tocolysis and betamethasone

In most cases, management of preterm labor would include tocolysis for 48 hours and administration of two doses of betamethasone to accelerate fetal lung maturity.

The usual dosage regimen is betamethasone 12 mg IM STAT, then repeat in 24 hours.

An alternative medication is dexamethasone for a total of 24 mg (usual dosing regimen is 6 mg IM every 12 for 4 doses).

Treatment should be initiated in women with any symptoms or signs that might herald the onset of preterm delivery or a potential need for induced delivery, rather than waiting until the diagnosis or decision is certain. While a single complete course of antenatal corticosteroids provides multiple significant benefits to the preterm neonate, additional courses should not be used (Garite, 2009 [High Quality Evidence]; Guinn, 2001 [High Quality Evidence]; Thorp, 2001 [High Quality Evidence]).

Treatment should not be withheld because delivery appears to be imminent.

Antenatal corticosteroid therapy for fetal lung maturation reduces mortality, respiratory distress syndrome and intraventricular hemorrhage in preterm infants. These benefits accrue to preterm neonates across a broad range of gestational ages and are not limited by gender or race (Crowley, 2002 [Systematic Review]). The benefits of the administration of postnatal surfactant are enhanced by antenatal steroid therapy. No adverse consequences to a policy of administration of antenatal steroids to women in preterm labor have been identified (American College of Obstetricians and Gynecologists, The, 2002a [Guideline]; American College of Clinical Pharmacy, 2000 [Guideline]).

The beneficial effects of corticosteroids are greatest more than 24 hours after beginning treatment. However, treatment less than 24 hours in duration may improve outcome. Every effort should be made to treat women before spontaneous or elective preterm delivery.
B. Administer antibiotics for group B streptococcus (GBS) prophylaxis until GBS results are back.
   Please refer to the GBS prophylaxis guidelines at your institution (Hager, 2000 [Low Quality Evidence]).
   The Agency for HealthCare Research and Quality reviewed literature on the use of antibiotics in preterm labor (Agency for HealthCare Research and Quality, 2000 [Guideline]).
   (Centers for Disease Control and Prevention, 2002 [Guideline]).

50. Vaginal Pool + Amniocentesis at 32+ Weeks for Fetal Lung Maturity (FLM)
Phosphatidyl glycerol (PG) is a reliable indicator of FLM if present in vaginal pool specimens. Lecithin/sphingomyelin ratio is unreliable if blood and/or meconium are present in the fluid. Certain assays of PG may be influenced by the presence of heavy growth of gardnerella vaginalis. Please consult with your local hospital clinical laboratory (Beazley, 1996 [Low Quality Evidence]).
Maternal chorioamnionitis and hospital length of stay were lessened with induction of labor in preterm premature rupture of membranes (pPROM) with mature fetal lung maturity studies after 32 weeks, with no difference in neonatal outcomes compared with expectant management (Mercer, 1993 [Low Quality Evidence]).

52. Management of Preterm Labor with Bleeding
In the presence of preterm labor with bleeding, IV access is essential.
   • The patient should be on strict bed rest.
   • Blood should be typed and crossmatched.
   • Complete blood counts (CBCs) with platelets, prothrombin time (PT), partial thromboplastin time (PTT) and fibrinogen.
   • Continue fetal monitoring while bleeding.

55. Deliver for Fetal Distress/Chorioamnionitis/Active Labor/34 Weeks PROM/Other Obstetrical Indicators
Under these conditions, we recommend delivery (Hauth, 2006 [Low Quality Evidence]).
A "break point" in neonatal morbidity was observed at 34 weeks gestation, which supports induction of labor at this gestational age (Neerhof, 1999 [Low Quality Evidence]).

Vaginal Birth After Caesarean (VBAC) Algorithm Annotations
A well-thought-out and informed discussion between the clinician and the patient about VBAC should have occurred prior to the pregnant woman presenting for delivery. Once labor begins, the clinicians must keep the patient informed of the progress (or lack of it) of labor and the status of the baby. If it is likely that a vaginal delivery will be harmful to the baby or the mother, this must be communicated and options discussed.

58. Special Considerations of Labor Management
   • Availability of a team capable of performing a Caesarean delivery within a short time (American College of Obstetricians and Gynecologists, The Practice Bulletin, 2010c [Guideline]).
• Review the prior operative report(s) to ensure that the uterine incision did not involve the contractile portion of the uterus such as a classical incision. A VBAC after a Caesarean with classical incision carries a tenfold higher risk of uterine rupture compared to a low transverse uterine incision.

• Intermittent auscultation or continuous electronic fetal heart rate monitoring should be done. See Intrapartum Fetal Heart Rate (FHR) Management algorithm.

• Augmentation or induction of labor with oxytocin increases the risk of uterine rupture (Blanchette, 2001 [Low Quality Evidence]) though the risk is still low (1-2.4%). Oxytocin and prostaglandin were not individually associated with uterine rupture except when sequential prostaglandin-oxytocin was used (Macones, 2005 [Low Quality Evidence]). A meta-analysis (Dodd, 2006 [Low Quality Evidence]) found sufficient evidence to help in choosing planned induction in VBAC versus elective repeat Caesarean delivery.

• The ACOG Committee on Obstetric Practice recommends that misoprostol not be used for induction of labor in women with prior Caesareans or major uterine surgery (American College of Obstetricians and Gynecologists, The, 2010c [Guideline]).

• Use of the Foley bulb catheter has a uterine rupture rate close to that of women laboring spontaneously and has a VBAC success rate similar to that of women who have induced labor (Ravasia, 2000 [Low Quality Evidence]). The intracervical catheter ripening method does not stimulate uterine contractions, which is an advantage for women with previous Caesareans (Bujold, 2004 [Low Quality Evidence]). The Society of Obstetricians and Gynecologists of Canada has endorsed the use of the Foley bulb catheter for cervical ripening for women with a low transverse uterine scar. ACOG has no statement either endorsing or discouraging mechanical dilators for cervical ripening in women attempting VBAC (SOGC Clinical Practice Guidelines, 2005 [Guideline]).

61. Complicated Labor Management

The same considerations for intervention in labor apply to VBACs as for other attempted deliveries.

Complicated labor can be manifested in several categories:

• Failure to progress – the same considerations for intervention – including amniotomy, oxytocin, epidural anesthesia/analgesia – apply to VBACs. If indication for primary Caesarean was dystocia, percentage successful VBACs was 77%. Women who required oxytocin for induction had 58% successful vaginal delivery versus 88% who required oxytocin for augmentation (Sakala, 1990 [Low Quality Evidence]; Silver, 1987 [Low Quality Evidence]; Stovall, 1987 [Low Quality Evidence]).

• Fetal distress – see Intrapartum Fetal Heart Rate (FHR) Management algorithm and annotations.

• Maternal complications – preeclampsia and exacerbation of pre-existing maternal illness are managed similarly in complicated VBAC versus a complicated vaginal labor patient.

• Uterine rupture – the scarred uterus has an increased potential to rupture. Uterine rupture occurs in between 1/100 and 1/11,000 deliveries, depending on whose data one uses and the clinical presentation. The type of scar makes a difference in frequency of rupture and severity of symptoms, also (LST 0.2-0.8 Classical 4.3-8.8, T4.3-8.8, Low Vertical 0.5-6.5) (Pridjian, 1992 [Low Quality Evidence]).

Rupture through a low segment transverse scar is much more likely to go undetected or produce maternal hypovolemia or gradual fetal distress. Complete rupture with expulsion of fetus or placenta is a true obstetric emergency and can lead to maternal or hypovolemic complication, even death, as well as fetal hypoxia and death.
Conditions that increase the risk for uterine rupture:

- Previous uterine injury, Caesarean delivery, myomectomy, etc.
- Intrapartum – hyperstimulation, difficult forceps, internal podalic versions, fundal pressure, etc.
- Uterine defects not related to trauma, e.g., congenital defect, invasive mole
- Multiple previous Caesarean deliveries

Signs and symptoms of uterine rupture include:

- Fetal distress – 50-70% of detected ruptures present with abnormal FH tracings (e.g., variable decelerations that evolve into late decelerations)
- Uterine pain, especially pain over previous incision that continues between contractions
- Hemorrhage – intra-abdominal, vaginal or urinary
- Palpation of fetal parts
- Loss of contractions
- Recession of presenting part
- Fetal death

Uterine scar disruptions can be classified into three types:

- Scar dehiscence – Opening of previous scar, with intact overlying peritoneum (uterine serosa), no expulsion of uterine contents
- Incomplete rupture – Opening of previous scar, but not overlying peritoneum, extraperitoneal extrusion of intrauterine contents
- Complete rupture – Opening of previous scar and overlying peritoneum with extrusion of intrauterine contents into peritoneal cavity

(American College of Obstetricians and Gynecologists, 2006 [Guideline]; Pridjian, 1992 [Low Quality Evidence])

Management of Labor Dystocia Algorithm Annotations

During labor dystocia the patient plays a significant role as a partner in her care. It is imperative that the clinicians keep the mother informed about her labor and discuss what interventions/options are necessary for a safe delivery of the baby. Explain status, using terms the patient can understand.

64. Labor Dystocia Diagnosis

Labor abnormalities are classified as either protraction disorders (slower than normal progress) or arrest disorders (complete cessation of progress). Labor dystocia can only be defined when labor is in the active phase. Management of labor dystocia is especially important in nulliparous women to prevent unneeded Caesarean sections (Gifford, 2000 [Low Quality Evidence]).

Friedman provided the definition for "normal labor" in the 1950s. Further observation has shown that the definition of "normal labor" is broader than Friedman’s definition. Recent evidence obtained in the context of contemporary obstetric practice suggests that the inflection point for transition from the latent to active phase of labor occurs at 6 cm dilation. It further suggests that progress in the active phase of labor may occur at a faster rate in multiparas than nulliparas (Zhang, 2010 [Low Quality Evidence]). This has lead to more flexibility in the management of abnormal labor, assuming that mother and baby are doing well.
66. Less than 1 cm Dilation for Two Consecutive Hours and 6 cm Dilation?

Labor progress is measured by checking for cervical change using a digital cervical exam. During the active phase of labor, cervical exams should document at least 1 cm dilation every two hours. Regular cervical checks during active labor afford the best opportunity to assess the progress of labor and to diagnose labor with abnormal progress.

At least one clinical trial testing the effectiveness of active management of labor in reducing Caesarean deliveries used hourly cervical exams; others studies have used every-two-hour exams. The "two-hour" rule for determining dilatation has been challenged; however, there is evidence indicating that in both nulliparas and multiparas, it may take up to two hours to demonstrate 1 cm of change in cervical dilation during the active phase of labor (Zhang, 2010 [Low Quality Evidence]; American College of Obstetricians and Gynecologists, The Practice Bulletin, 2003 [Guideline]; Zhang, 2002 [Low Quality Evidence]; Frigoletto, 1995 [High Quality Evidence]; López-Zeno, 1992 [High Quality Evidence]).

67. Management of Protracted Labor Stage I

If the patient in Stage I labor is not making progress, management of protraction disorders will include evaluating the potential causes and directing management appropriately (Sadler, 2000 [High Quality Evidence]; Frigoletto, 1995 [High Quality Evidence]; López-Zeno, 1992 [High Quality Evidence]).

Power: hypocontractile uterine activity is the most common cause of first stage of labor abnormalities. Adequate contractions are defined as a minimum of 200 Montevideo units in 10 minutes (Bakker, 2010 [High Quality Evidence]).

Possible interventions:

- IV fluids (IV fluids 150 cc/hr may decrease the need for oxytocin augmentation) (Garite, 2000 [High Quality Evidence]).

- Artificial rupture of membranes if membranes are intact and there are no contraindications. (See Annotation #12, "Intrapartum Care.") Although amniotomy is often performed in cases of protracted labor as an isolated intervention, there is evidence that this does not shorten the duration of labor nor reduce Caesarean delivery (Smyth, 2013 [Systematic Review]).

- Discontinuing or reducing epidural anesthesia, as the use of epidurals, has been shown to increase the length of labor. However, there is no increased rate of Caesarean birth for dystocia when epidural anesthesia is in use (Rogers, 1999 [Low Quality Evidence]; King, 1997 [Low Quality Evidence]).

- Oxytocin has been associated with tachysystole (> 75 contractions per 10 minutes) (American College of Obstetricians and Gynecologists, The, 2009a [Guideline]).

- The use of oxytocin augmentation has been shown to shorten labor by hours (Hinshaw, 2008 [High Quality Evidence]).

Contraindications to oxytocin augmentation include:

- unknown presentation or floating/unstable,
- patient refusal, and
- inability to monitor contractions adequately.
- Passenger: check for malposition, malpresentation, macrosomia.
- Passageway: is pelvis adequate? Is there cephalopelvic disproportion?
• Obtain an obstetrical/surgical consult if necessary. Caesarean delivery is performed when there is an arrest of labor: patient has not made progress for two to four hours after strength of contractions deemed adequate (regardless of oxytocin dosage or duration of oxytocin). Extending time of observation to four hours before operative treatment has been shown to decrease the Caesarean delivery rate for arrested labor (Rouse, 2001 [Low Quality Evidence]).

73. Fetal Head Descent Greater than 1 cm/Hour?

When the patient has reached Stage II labor, a reassessment at least every 30 minutes for two consecutive hours is done to assess descent of the fetus and rotation of the fetus. If the patient is making appropriate progress, the caregiver can anticipate vaginal delivery. Fetal descent should be greater than 1 cm per hour.

If labor is not progressing, consider an internal monitor to measure strength of uterine contractions. After two hours of internal monitoring there should be enough evidence to determine if patient is making progress (Harbert, 1992 [Low Quality Evidence]).

Relative contraindications to direct, invasive monitoring include HIV maternal infection, certain fetal presentations and conditions that preclude vaginal examinations such as placenta previa or undiagnosed vaginal bleeding (Association of Women's Health Obstetrics and Neonatal Nurses, 2003 [Guideline]).

75. Management of Protracted Labor – Stage II Labor

If the patient in Stage II labor is not making progress, management of protraction disorders will include evaluating the potential causes and directing management appropriately.

• Power – hypocontractility may be a common cause of Stage II protraction
  - Consider oxytocin augmentation
  - Consider assisted delivery
• Passenger – check for malposition, malpresentation, macrosomia
  - Evaluate the fetal position
  - Consider rotation of the fetus
• Passageway – is the pelvis adequate? Is there cephalopelvic disproportion?
  - Evaluate the maternal position: consider having the patient move into different positions such as on hands and knees to change the relative size of the pelvis.

  - Consider OB/surgical consultation, and plan when to assemble team for Cesarean birth.

(Saunders, 1992 [Low Quality Evidence]; Minnesota Clinical Comparison and Assessment Project, 1991 [Guideline])

76. Is the Head Descending?

Prolongation of the second stage of labor beyond an arbitrary time limit is no longer an indication for assisted vaginal or Caesarean delivery. As long as progress is being made and fetal monitoring is Category I or II, the patient can continue pushing (Cheng, 2004 [Low Quality Evidence]; Myles, 2003 [Low Quality Evidence]).
77. Assisted Vaginal Delivery Indicated?

If there is no descent for two hours despite optimizing labor, an assisted delivery or surgical consult is suggested. Vacuum extraction or mid/low forceps delivery contraindications include:

- vertex is too high,
- clinician is inexperienced,
- fetal distress with inability to do timely operative vaginal delivery, and
- patient refusal.

Note: When using vacuum extraction or forcep application with a suspected macrosomic infant, be aware of the risk of shoulder dystocia.

(Shields, 2007 [Low Quality Evidence]; Rouse, 2001 [Low Quality Evidence]; O’Driscoll, 1984 [Low Quality Evidence])

Intrapartum Fetal Heart Rate (FHR) Monitoring Algorithm Annotations

80. Continuous EFM-ext or EFM-int (if needed)

Electronic fetal monitoring (EFM) is indicated in all high-risk situations and may be considered in situations when the auscultatory pattern is unclear. Internal EFM may allow easier patient positioning and promote patient activity by being less confining than external EFM. Low-risk patients should be encouraged to be as active and mobile as possible.

82. FHR Pattern Is Predictive of Normal Acid-Base Status?

All obstetrical nurses, nurse midwives and physicians must achieve competence and confidence in fetal heart rate monitoring and FHR pattern analysis. Based on careful review of the available options, a three-tier system for the categorization of FHR patterns is recommended. Fetal heart rate tracing patterns can provide information on the current acid-base status of the fetus but cannot predict the development of cerebral palsy. Categorization of the FHR tracing evaluates the fetus at that point in time; tracing patterns can and will change (Macones, 2008 [Low Quality Evidence]).
Table 1. Electronic Fetal Monitoring Definitions

<table>
<thead>
<tr>
<th>Category of FHR Pattern Interpretation</th>
<th>Baseline (BL) and Variability</th>
<th>Accelerations (15 x 15)</th>
<th>Decelerations</th>
<th>Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category I: strongly predictive of normal fetal acid-base status</td>
<td>• BL 110-160 • Moderate variability</td>
<td>• Present or absent</td>
<td>+/- Early decels • No variable or late decelerations</td>
<td>No specific interventions required, ongoing assessment and evaluation.</td>
</tr>
<tr>
<td>Category II: Indeterminate. Not predictive of abnormal fetal acid-base status</td>
<td>• BL &lt; 110 without absent variability • BL &gt; 160 • Marked variability • Absent variability without decelerations</td>
<td>• Absence of accelerations after fetal stimulation</td>
<td>• Prolonged decelerations (≥ 2 minutes but &lt; 10 minutes) • Recurrent late decels with moderate variability • Recurrent variable decels with minimal or moderate variability</td>
<td>Requires evaluation and continued surveillance. Review and take into account associated clinical circumstances.</td>
</tr>
<tr>
<td>Category III: Predictive of abnormal fetal acid-base status at the time of observation</td>
<td>• Absent variability and any of the following: • Recurrent late decels • Recurrent variable decels • BL &lt; 110 • Sinusoidal pattern</td>
<td></td>
<td></td>
<td>Prompt evaluation and management indicated. May include: • Maternal position change • Maternal oxygen • Discontinuation of labor stimulus • Treatment of possible underlying condition • Expedited delivery</td>
</tr>
</tbody>
</table>

Developed by the guideline committee.


Definitions:

Late decelerations
- Deceleration is delayed in timing, onset-to-nadir if the deceleration is 30 seconds or greater, and there is a gradual decrease and return to baseline.

Early decelerations
- Onset, nadir and recovery mirror the beginning, peak and ending of the contraction.

Variable decelerations
- Abrupt decrease in the FHR with onset to nadir of deceleration reached in less than 30 seconds, decrease in FHR is 15 seconds or greater and less than two minutes in duration.
Variability

• Fluctuations in the FHR baseline over a 10-minute window, accelerations and decelerations are not included in the range.

• Absent - amplitude range is undetectable.

• Minimal - amplitude range is between 2 beats per minutes (bpm) and 5 bpm.

• Moderate - amplitude range is between 6 bpm and 25 bpm.

• Marked - amplitude range is greater than 25 bpm.

Recurrent

• Decelerations that occur with 50% or greater of uterine contractions in any 20-minute window.

Sinusoidal pattern

• Cyclic, smooth, sine wavelike undulating pattern in the FHR baseline frequency cycle of 3-5 per minute that persists for 20 minutes or longer.


84. Assessment and Intrauterine Resuscitation

A persistent Category II or Category III FHR tracing requires evaluation of the possible causes. Initial evaluation and treatment may include:

• discontinuation of any labor stimulating agent

• administer intravenous fluid bolus

• cervical examination to assess for umbilical cord prolapse or rapid cervical dilation or descent of the fetal head

• changing maternal position to the left or right lateral recumbent position, reducing compression of the vena cava and improving uteroplacental blood flow

• monitoring maternal blood pressure level for evidence of hypotension, especially in those with regional anesthesia (if present, treatment with ephedrine or phenylephrine may be warranted)

• assessment of patient for uterine tachysystole that affects fetal heart rate tracing by evaluating uterine contraction frequency and duration

• amnioinfusion – indications for therapeutic amnioinfusion include repetitive severe variable decelerations and prolonged decelerations (Fraser, 2005 [High Quality Evidence]; Rinehart, 2000 [High Quality Evidence]; Miyazaki, 1985 [High Quality Evidence]). Amnioinfusion for thick meconium is no longer recommended

• consider obstetrical surgical consultation if bradycardia with minimal or absent variability or prolonged declarations or both do not resolve. (See Annotation #89, "Emergent Delivery.")

88. Further FHR Assessment Predictive of Normal Acid-Base Status?

Scalp stimulation or vibroacoustic testing may be used for further fetal assessment. A 15-beat-per-minute rise in FHR lasting 15 seconds from the beginning to the end of the acceleration in response to scalp stimulation or to vibration or sound is predictive of normal fetal acid-base status. If the scalp stimulation test or vibroacoustic test response is abnormal, immediate delivery is indicated.

Other tests to assess fetal acid-base status may be helpful if available. This includes fetal scalp sampling for pH. A scalp pH greater than 7.19 is a positive result (Skupski, 2002 [Meta-analysis]; Smith, 1986 [Low Quality Evidence]).

However, proper FHR pattern interpretation and the response to scalp stimulation or vibroacoustic stimulation can allow the clinician to detect tracings predictive of abnormal feta acid-base status.

Knowledge of the fetal oxygen saturation is not associated with a reduction in the rate of Caesarean delivery or with improvement in the condition of the newborn (Bloom, 2006 [High Quality Evidence]).

89. Emergent Delivery

Tracings predictive of abnormal fetal acid-base status (Category III) indicate the need for emergent delivery. Delivery should be affected by appropriate means, depending on the clinical situation. This may include vacuum extraction, forceps or Caesarean delivery, depending upon fetal presentation and the expertise of the attending physician(s).

Caesarean delivery should be performed if vacuum extraction or forceps are inappropriate for use.

If a Caesarean delivery is performed, the suitability of a VBAC in a subsequent pregnancy should be discussed with the patient.

The following are indications for Caesarean birth based on abnormal FHR monitoring, according to the Minnesota Clinical Comparison and Assessment Project:

- Late decelerations that comprise the majority of contractions over a minimum 20-minute period in the absence of adequate beat-to-beat variability and that do not respond to remedial techniques.
- Severe variable decelerations that comprise the majority of contractions over 20-60 minutes and that do not respond to remedial techniques.
- Severe persistent non-remediable bradycardia.
- Scalp pH less than 7.2 or negative FHR acceleration test (confirmation in 15-20 minutes recommended).
- There may be other combinations or non-remediable patterns that may not meet severity criteria listed above that may be indications for preparation for Caesarean birth. A scalp pH or FHR acceleration test (scalp or acoustic) may help clarify the issue. Consultation or second opinion is suggested.
- In the second stage of labor, depending on the judgment and skill of the physician, operative vaginal delivery may be the least hazardous for the mother and child.

If one-minute Apgar is less than three, or five-minute Apgar is less than six, cord pH or gases are recommended. Cord pH is a better indicator than Apgar for fetal compromise. A segment of umbilical cord is isolated with clamps and may be stored up to 60 minutes after delivery with reliable umbilical artery pH determination. The segment does not need to be heparinized or placed on ice (Johnson, 1993 [Low Quality Evidence]; Duerbeck, 1992 [Low Quality Evidence]).
The Aims and Measures section is intended to provide protocol users with a menu of measures for multiple purposes that may include the following:

- population health improvement measures,
- quality improvement measures for delivery systems,
- measures from regulatory organizations such as Joint Commission,
- measures that are currently required for public reporting,
- measures that are part of Center for Medicare Services Physician Quality Reporting initiative, and
- other measures from local and national organizations aimed at measuring population health and improvement of care delivery.

This section provides resources, strategies and measurement for use in closing the gap between current clinical practice and the recommendations set forth in the guideline.

The subdivisions of this section are:

- Aims and Measures
- Implementation Recommendations
- Implementation Tools and Resources
- Implementation Tools and Resources Table
Aims and Measures

1. Increase the percentage of patients with preterm labor (of less than 34 weeks) who receive antenatal corticosteroids. *(Annotations #35, 43, 48)*

   Measure for accomplishing this aim:
   a. Percentage of patients with preterm labor who received antenatal corticosteroids prior to delivery.

2. Increase the percentage of patients who have procedures that assist in progress to vaginal birth. *(Annotations #12, 67)*

   Measure for accomplishing this aim:
   a. Percentage of patients with protracted labor who are administered oxytocin.

3. Increase the percentage of patients who are assessed for risk status on entry to labor and delivery. *(Annotation #13)*

   Measure for accomplishing this aim:
   a. Percentage of patients who are assessed for risk status on entry to labor and delivery.

4. Increase the percentage of patients who have intrauterine resuscitation techniques for fetal tachysystole or Category III heart rate tracings. *(Annotation #84)*

   Measures for accomplishing this aim:
   a. Percentage of patients whose oxytocin is discontinued.
   b. Percentage of patients who have an IV fluid bolus administered.
   c. Percentage of patients whose position is changed to the left or right side to decrease compression of vena cava.

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Measurement Specifications

Measurement #1a
Percentage of patients with preterm labor who received antenatal corticosteroids prior to delivery.

Population Definition
All patients giving birth who are in preterm labor.

Data of Interest
\[
\frac{\text{# of patients less than 34 weeks gestation who received antenatal corticosteroids prior to delivery}}{\text{# patients in preterm labor}}
\]

Numerator/Denominator Definitions
Numerator: Number of patients in preterm labor who received antenatal corticosteroids prior to delivery.
Denominator: Number of patients in preterm labor.

Method/Source of Data Collection
Review electronic medical records for information on patients who delivered preterm. Determine the number of patients who delivered preterm who received antenatal corticosteroids prior to delivery.

Time Frame Pertaining to Data Collection
Monthly.

Notes
This is a process measure, and improvement is noted as an increase in the rate.

Return to Table of Contents
Measurement #2a
Percentage of patients with protracted labor who are administered oxytocin.

Population Definition
All women giving birth who are:
- full term (37 completed weeks),
- without concomitant medical problems,
- having contractions,
- singleton fetus,
- cephalic presentation,
- no evidence of fetal distress, and
- expected to have a normal spontaneous vaginal delivery.

Data of Interest
\[
\frac{\text{# of births with oxytocin}}{\text{# of patients with protracted labor}}
\]

Numerator/Denominator Definitions
Numerator: Number of patients who were given oxytocin.
Denominator: Number of patients as described in population definition who are in protracted labor.

Method/Source of Data Collection
Review electronic medical records to determine the number of patients as described in population definition who were in protracted labor. Then determine the number of those patients who were given oxytocin.

Time Frame Pertaining to Data Collection
Monthly.

Notes
This is a process measure, and improvement is noted as an increase in the rate.

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Measurement #3a
Percentage of patients who are assessed for risk status on entry to labor and delivery.

Population Definition
All patients who present in labor.

Data of Interest
\[
\frac{\text{# of patients who are assessed for risk status on entry to labor and delivery}}{\text{# of patients who present in labor}}
\]

Numerator/Denominator Definitions
Numerator: Number of patients with evidence of assessment for risk status on entry to labor and delivery to include:
- 20-minute fetal heart rate (FHR) assessment,
- patient assessment,
- prenatal risk review, and
- risk in labor assessment.

Denominator: Number of patients who present in labor.

Method/Source of Data Collection
Review electronic medical records to determine the number of patients who were in labor. Then determine the number of patients who had assessment for risk status on entry to labor and delivery which could include the following:
- 20-minute fetal heart rate (FHR) assessment,
- patient assessment,
- prenatal risk review and
- risk in labor assessment.

Time Frame Pertaining to Data Collection
Monthly.

Notes
Risk assessment should be performed on all patients in active labor and is the responsibility of all members of the health care team. That includes but is not limited to nurses, midwives and physicians.
This is a process measure, and improvement is noted as an increase in the rate.

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Measurement #4a

Percentage of patients whose oxytocin is discontinued.

Population Definition

All women who present in labor.

Data of Interest

\[
\frac{\text{# of patients whose oxytocin is discontinued}}{\text{# of patients who present in labor}}
\]

Numerator/Denominator Definitions

Numerator: Number of patients whose oxytocin is discontinued.

Denominator: Number of patients who present in labor.

Method/Source of Data Collection

Review electronic medical records to determine the number of women who were in labor. Then determine the number of women who had oxytocin discontinued.

Time Frame Pertaining to Data Collection

Monthly.

Notes

This is a process measure, and improvement is noted as an increase in the rate.
Measurement #4b
Percentage of patients who have an IV fluid bolus administered.

Population Definition
All patients who present in labor.

Data of Interest
\[
\frac{\text{# of patients who have an IV fluid bolus administered}}{\text{# of patients who present in labor}}
\]

Numerator/Denominator Definitions
Numerator: Number of patients who have an IV fluid bolus administered.
Denominator: Number of patients who present in labor.

Method/Source of Data Collection
Review electronic medical records to determine the number of patients who were in labor. Then determine the number of patients who had IV fluid bolus administered.

Time Frame Pertaining to Data Collection
Monthly.

Notes
This is a process measure, and improvement is noted as an increase in the rate.

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Measurement #4c

Percentage of patients whose position is changed to the left or right side to decrease compression of vena cava.

Population Definition

All patients who present in labor.

Data of Interest

\[
\frac{\text{# of patients whose position is changed to the left or right side to decrease compression of vena cava}}{\text{# of patients who present in labor}}
\]

Numerator/Denominator Definitions

Numerator: Number of patients whose position is changed to the left or right side to decrease compression of vena cava.

Denominator: Number of patients who present in labor.

Method/Source of Data Collection

Review electronic medical records to determine the number of patients who were in labor. Then determine the number of patients whose position is changed to the left or right side to decrease compression of vena cava.

Time Frame Pertaining to Data Collection

Monthly.

Notes

This is a process measure, and improvement is noted as an increase in the rate.
Implementation Tools and Resources

Criteria for Selecting Resources

The following tools and resources specific to the topic of the guideline were selected by the work group. Each item was reviewed thoroughly by at least one work group member. It is expected that users of these tools will establish the proper copyright prior to their use. The types of criteria the work group used are:

- The content supports the clinical and the implementation recommendations.
- Where possible, the content is supported by evidence-based research.
- The author, source and revision dates for the content are included where possible.
- The content is clear about potential biases and when appropriate conflicts of interests and/or disclaimers are noted where appropriate.

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### Implementation Table and Resources Table

<table>
<thead>
<tr>
<th>Author/Organization</th>
<th>Title/Description</th>
<th>Audience</th>
<th>Web Sites/Order Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>American College of Obstetricians &amp; Gynecologists (ACOG)</td>
<td>OB/GYN topics</td>
<td>Professionals</td>
<td><a href="http://www.acog.org">http://www.acog.org</a></td>
</tr>
<tr>
<td>American College of Obstetricians &amp; Gynecologists (ACOG)</td>
<td>Vaginal Birth After Caesarean (pamphlet)</td>
<td>Public</td>
<td><a href="http://www.sales.acog.org">http://www.sales.acog.org</a> 1-800-762-2264 #AP070</td>
</tr>
<tr>
<td>American College of Obstetricians &amp; Gynecologists (ACOG)</td>
<td>Fetal Heart Rate Monitoring During Labor (pamphlet)</td>
<td>Public</td>
<td><a href="http://www.sales.acog.org">http://www.sales.acog.org</a> 1-800-762-2264 x830; #18015</td>
</tr>
<tr>
<td>March of Dimes</td>
<td>Includes downloadable fact sheets on a wide variety of topics related to healthy pregnancy and delivery of healthy babies. Fact sheets include prenatal nutrition, healthy lifestyle before, during and after pregnancy, and prevention of birth defects. Q &amp; A option.</td>
<td>Public &amp; Professionals</td>
<td><a href="http://www.marchofdimes.com">http://www.marchofdimes.com</a> Toll-free number also available for direct contact with the March of Dimes: 1-888-MODIMES (663-4637)</td>
</tr>
<tr>
<td>March of Dimes</td>
<td>Preterm Labor (Bilingual)</td>
<td>Public</td>
<td>1-800-367-6630 #37-2447-09</td>
</tr>
<tr>
<td>March of Dimes</td>
<td>Signs of Preterm Labor (flyer)</td>
<td>Public</td>
<td>1-800-367-6630 English #09-1099-98; 37-2379-08 Spanish #09-1100-98 37-2045-06</td>
</tr>
<tr>
<td>Mayo Clinic</td>
<td>Includes alphabetical listings of conditions as well as search capabilities for information on specific areas of health care including many aspects of prenatal care.</td>
<td>Public</td>
<td><a href="http://www.mayoclinic.com">http://www.mayoclinic.com</a></td>
</tr>
</tbody>
</table>

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Legend

ICSI order sets utilize two types of boxes for orders. One is the open box that clinicians will need to check for the order to be carried out. The second box is a pre-checked box and are those orders that have strong evidence and/or are standard of care and require documentation if the clinician decides to "uncheck" the order.

There is increasing evidence that pre-checked boxes are more effective in the delivery of care than physician reminders, even within the computerized medical record environment. Organizations are recognizing the benefit of using pre-checked boxes for other orders to promote efficiency. Organizations are encouraged, through a consensus process, to identify those orders to utilize pre-checked boxes to increase efficiency, reduce calls to clinicians, and to reduce barriers for nursing and other professionals to provide care that is within their scope.

Annotations Numbers

Throughout the order set you will note annotation numbers. These annotation numbers correspond with the guideline itself and provide associated discussion and evidence when available.

Medication

It is assumed that clinicians will supplement this information from standard pharmaceutical sources to inform their decisions for individual patients.
Order Set

This order set pertains to those orders for routine obstetrical labor admission and does not include preoperative and screening orders from the physician’s office.

Legend:
- Open boxes are orders that a clinician will need to order by checking the box.
- Pre-checked boxes are those orders with strong supporting evidence and/or regulatory requirements that require documentation if not done.

Patient Information (Two are required.)

<table>
<thead>
<tr>
<th>Last name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>First name:</td>
</tr>
<tr>
<td>Date of birth: __ / __ / ___</td>
</tr>
<tr>
<td>Patient’s age:</td>
</tr>
<tr>
<td>ID #:</td>
</tr>
</tbody>
</table>

Admit/Attending Information (See Annotation #2)

Admit unit: __________________________

Attending physician: __________________________

How to contact: __________________________

CNM: __________________________

Diagnosis

Admitting Dx: __________________________

☐ Active labor
☐ Contraction
☐ Other

Secondary Dx: __________________________

E.D.D. ______/______/______ Wk. Gest. ________ Gravida ________ Para _______

Condition

☐ Stable ☐ Other __________________________

Vitals

☐ Routine (as defined by institution) ☐ every ______ hour

☐ Notify physician/CNM if temperature exceeds ______° C° (______° F°)

Patient weight: _______ kg
Patient height: _______ cm

Activity

☐ Activity (encourage movement, shower, rocker, birth ball) as tolerated
☐ Bathroom privileges with assist as needed
☐ Strict bed rest, encourage lying on side
Allergies and Adverse Drug Reactions

☐ None
☐ Yes, Name: ___________________________ Type of reaction: ___________________________
          ___________________________ Type of reaction: ___________________________
          ___________________________ Type of reaction: ___________________________

Nursing (See Annotation #12)
For supportive care, use standard nursing protocols
☐ Catheterize bladder as needed for bladder distention or inability to void

Initial Assessment (Perform and document risk assessment) (See Annotation #12)
☑ Baseline electronic fetal monitoring strip.
☑ Notify physician/CNM of any non-reassuring fetal heart rate
☑ Patient assessment (according to hospital protocol)
  ☐ Cervical exam: dilation, effacement, station, ROM, clarity of fluid, fetus presentation
☑ Prenatal risk review
☑ Risk in labor review

Subsequent Monitoring (Perform and document risk assessment) (See Annotations #12, 80, 82)
☐ Nurse auscultation during and for 30 seconds after one contraction every 30 minutes during the active phase of the first stage and every 15 minutes during the second stage of labor (indicated for low-risk situations)
☐ Electronic fetal monitoring (continuous or intermittent) per hospital protocol
☐ Continuous electronic monitoring (indicated for high-risk situations)
☑ Notify physician/CNM whenever the fetal heart rate tracing is either unclear or predictive of fetal acidemia.

Active Labor Progress (See Annotation #66)
☐ Nurse to check and document progress of labor (dilation, effacement and station) by cervical checks every ______ hours
☑ Notify physician/CNM if dilation increases less than 1 cm/hour for two consecutive hours.

Diet
☐ as tolerated ☐ nothing by mouth ☐ diabetic ☐ ice chips only ☐ clear liquids

IVs
☐ Establish IV saline lock with flush
  ☐ IV D5LR at _____ mL/hour
  ☐ IV lactated ringers at _____ mL/hour (for diabetic patients)
  ☐ Other:_______________________________ at _______ mL/hour

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Sedative/Symptom Medication *(See Annotation #12)*

**Pain relief**
- Nalbuphine hydrochloride (Nubain®) _______ mg every _______ hour(s) by □ IM □ IV
- Fentanyl _______ mcg every _______ hour(s) by □ IM □ IV
- Epidural anesthesia (separate order per hospital protocol)
- Intrathecal opioids (separate order per hospital protocol)
- Have available local anesthetic (per hospital protocol) for episiotomy/laceration repair
- Morphine (separate order [per hospital protocol])

**Other Medications**
- Antacid (institutional preference) 30 ml by mouth for GI discomfort. May repeat one dose.
- Acetaminophen 325 mg (1-3 tabs) by mouth every 6 hours as needed for headache
- Diphenhydramine 25 mg by mouth every 4 hours as needed for sleep/pruritus
- Hydroxyzine hydrochloride (Vistaril®) _______ mg every _______ hours by □ mouth □ IM
- Sodium phosphate enema as needed for constipation

**Antibiotics *(If Group B Strep positive or unknown)*

**No allergies**
- Penicillin G 5 million units with 10 mg Lidocaine per 100 mL piggyback IV load in labor, then 2.5 million units with 10 mg Lidocaine per 100 mL piggyback IV, every 4 hours until delivery (if no Lidocaine allergy)
- **Penicillin allergy – no anaphylaxis**
  - Cefazolin 2 g IV then 1g every 8 hours until delivery
- **Penicillin allergy – with anaphylaxis (if organism sensitive to penicillin and cefazolin)**
  - Clindamycin 900 mg IV every 8 hours until delivery
- **If resistant to clindamycin and erythromycin or sensitivities unknown**
  - Vancomycin 1 gm every 12 hours until delivery
  - Other ____________________________ _______ mg every _______ hours until delivery

**Lab/Diagnostic Tests**
- Hemoglobin
- Type and Screen
- Drug Screen *(obtain consent if necessary)*

**If not available from prenatal records:**
- ABO Rh
- Rubella Antibody, IgG
- Hepatitis B Surface Antigen
- Rapid Plasma Reagin (VDRL)
- Group B Strep test
- HIV *(obtain consent to test)*
- Other tests: ____________________________

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Other

**Consults**
- [ ] Obstetrical
- [ ] Surgical
- [ ] Endocrinology
- [ ] Neonatology
- [ ] Pediatrics

**Other orders**

- [ ]
- [ ]

Authorized Prescriber Signature: ______________________________

Printed Name: ______________________________

Date/Time of Orders: _____/_____/_______  _____:______

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The subdivisions of this section are:

- References
- Appendices
References


American College of Obstetricians and Gynecologists, the. Magnesium sulfate before anticipated preterm birth for neuroprotection. Obstet Gynecol 2010a;115:669-71. (Guideline)


Links are provided for those new references added to this edition (author name is highlighted in blue).


Hauth JC. Spontaneous preterm labor and premature rupture of membranes at late preterm gestations: to deliver or not to deliver. *Semin Perinatol* 2006;30:98-102. (Low Quality Evidence)


Mercer BM, Crocker LG, Boe NM, Sibai BM. Induction versus expectant management in premature rupture of the membranes with mature amniotic fluid at 32 to 36 weeks: a randomized trial. *Am J Obstet Gynecol* 1993;169:775-82. (High Quality Evidence)


Smyth RMD, Aldred SK, Markham C. Amniotomy for shortening spontaneous labour (review). *Cochrane Database Syst Rev* 2013;1:CD006167. (Systematic Review)


Stovall TG, Shaver DC, Solomon SK, Anderson GD. Trial of labor in previous Caesarean section patients, excluding classical Caesarean sections. *Obstet Gynecol* 1987;70:713-17. (Low Quality Evidence)


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Appendix A – ICSI Shared Decision-Making Model

The technical aspects of Shared Decision-Making are widely discussed and understood.

- **Decisional conflict** occurs when a patient is presented with options where no single option satisfies all the patient’s objectives, where there is an inherent difficulty in making a decision, or where external influencers act to make the choice more difficult.

- **Decision support** clarifies the decision that needs to be made, clarifies the patient’s values and preferences, provides facts and probabilities, guides the deliberation and communication and monitors the progress.

- **Decision aids** are evidence-based tools that outline the benefits, harms, probabilities and scientific uncertainties of specific health care options available to the patient.

However, before decision support and decision aids can be most advantageously utilized, a Collaborative Conversation™ should be undertaken between the clinician and the patient to provide a supportive framework for Shared Decision-Making.

**Collaborative Conversation™**

A collaborative approach toward decision-making is a fundamental tenet of Shared Decision-Making (SDM). The Collaborative Conversation™ is an inter-professional approach that nurtures relationships, enhances patients’ knowledge, skills and confidence as vital participants in their health, and encourages them to manage their health care.

Within a Collaborative Conversation™, the perspective is that both the patient and the clinician play key roles in the decision-making process. The patient knows which course of action is most consistent with his/her values and preferences, and the clinician contributes knowledge of medical evidence and best practices. Use of Collaborative Conversation™ elements and tools is even more necessary to support patient, care clinician and team relationships when patients and families are dealing with high stakes or highly charged issues, such as diagnosis of a life-limiting illness.

The overall framework for the Collaborative Conversation™ approach is to create an environment in which the patient, family and care team work collaboratively to reach and carry out a decision that is consistent with the patient’s values and preferences. A rote script or a completed form or checklist does not constitute this approach. Rather it is a set of skills employed appropriately for the specific situation. These skills need to be used artfully to address all aspects involved in making a decision: cognitive, affective, social and spiritual.

**Key communication skills** help build the Collaborative Conversation™ approach. These skills include many elements, but in this appendix only the questioning skills will be described. (For complete instruction, see O’Connor, Jacobsen “Decisional Conflict: Supporting People Experiencing Uncertainty about Options Affecting Their Health” [2007], and Bunn H, O’Connor AM, Jacobsen MJ “Analyzing decision support and related communication” [1998, 2003].)

1. **Listening skills:**

   Encourage patient to talk by providing prompts to continue such as “go on, and then?, uh huh,” or by repeating the last thing a person said, “It’s confusing.”

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Paraphrase content of messages shared by patient to promote exploration, clarify content and to communicate that the person’s unique perspective has been heard. The clinician should use his/her own words rather than just parroting what he/she heard.

Reflection of feelings usually can be done effectively once trust has been established. Until the clinician feels that trust has been established, short reflections at the same level of intensity expressed by the patient without omitting any of the message’s meaning are appropriate. Reflection in this manner communicates that the clinician understands the patient’s feelings and may work as a catalyst for further problem solving. For example, the clinician identifies what the person is feeling and responds back in his/her own words like this: “So, you’re unsure which choice is the best for you.”

Summarize the person’s key comments and reflect them back to the patient. The clinician should condense several key comments made by the patient and provide a summary of the situation. This assists the patient in gaining a broader understanding of the situations rather than getting mired down in the details. The most effective times to do this are midway through and at the end of the conversation. An example of this is, “You and your family have read the information together, discussed the pros and cons, but are having a hard time making a decision because of the risks.”

Perception checks ensure that the clinician accurately understands a patient or family member, and may be used as a summary or reflection. They are used to verify that the clinician is interpreting the message correctly. The clinician can say “So you are saying that you’re not ready to make a decision at this time. Am I understanding you correctly?”

2. Questioning Skills

Open and closed questions are both used, with the emphasis on open questions. Open questions ask for clarification or elaboration and cannot have a yes or no answer. An example would be “What else would influence you to choose this?” Closed questions are appropriate if specific information is required such as “Does your daughter support your decision?”

Other skills such as summarizing, paraphrasing and reflection of feeling can be used in the questioning process so that the patient doesn’t feel pressured by questions.

Verbal tracking, referring back to a topic the patient mentioned earlier, is an important foundational skill (Ivey & Bradford-Ivey). An example of this is the clinician saying, “You mentioned earlier…”

3. Information-Giving Skills

Providing information and providing feedback are two methods of information giving. The distinction between providing information and giving advice is important. Information giving allows a clinician to supplement the patient’s knowledge and helps to keep the conversation patient centered. Giving advice, on the other hand, takes the attention away from the patient’s unique goals and values, and places it on those of the clinician.

Providing information can be sharing facts or responding to questions. An example is “If we look at the evidence, the risk is…” Providing feedback gives the patient the clinician’s view of the patient’s reaction. For instance, the clinician can say, “You seem to understand the facts and value your daughter’s advice.”

Additional Communication Components

Other elements that can impact the effectiveness of a Collaborative Conversation™ include:

- Eye contact
- Body language consistent with message
- Respect

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Self-examination by the clinician involved in the Collaborative Conversation™ can be instructive. Some questions to ask oneself include:

- Do I have a clear understanding of the likely outcomes?
- Do I fully understand the patient’s values?
- Have I framed the options in comprehensible ways?
- Have I helped the decision-makers recognize that preferences may change over time?
- Am I willing and able to assist the patient in reaching a decision based on his/her values, even when his/her values and ultimate decision may differ from my values and decisions in similar circumstances?

**When to Initiate a Collaborative Conversation™**

A Collaborative Conversation™ can support decisions that vary widely in complexity. It can range from a straightforward discussion concerning routine immunizations to the morass of navigating care for a life-limiting illness. Table 1 represents one health care event. This event can be simple like a 12 year-old coming to the clinic for routine immunizations, or something much more complex like an individual receiving a diagnosis of congestive heart failure. In either case, the event is the catalyst that starts the process represented in this table. There are cues for clinicians and patient needs that exert influence on this process. They are described below. The heart of the process is the Collaborative Conversation™. The time the patient spends within this health care event will vary according to the decision complexity and the patient’s readiness to make a decision.

Regardless of the decision complexity there are cues applicable to all situations that indicate an opportune time for a Collaborative Conversation™. These cues can occur singularly or in conjunction with other cues.

**Cues for the Care Team to Initiate a Collaborative Conversation™**

- **Life goal changes**: Patient’s priorities change related to things the patient values such as activities, relationships, possessions, goals and hopes, or things that contribute to the patient’s emotional and spiritual well-being.
• **Diagnosis/prognosis changes**: Additional diagnoses, improved or worsening prognosis.

• **Change or decline in health status**: Improving or worsening symptoms, change in performance status or psychological distress.

• **Change or lack of support**: Increase or decrease in caregiver support, change in caregiver, or caregiver status, change in financial standing, difference between patient and family wishes.

• **Change in medical evidence or interpretation of medical evidence**: Clinicians can clarify the change and help the patient understand its impact.

• **Clinician/caregiver contact**: Each contact between the clinician/caregiver and the patient presents an opportunity to reaffirm with the patient that his/her care plan and the care the patient is receiving are consistent with his/her values.

Patients and families have a role to play as decision-making partners, as well. The needs and influencers brought to the process by patients and families impact the decision-making process. These are described below.

**Patient and Family Needs within a Collaborative Conversation™**

• **Request for support and information**: Decisional conflict is indicated by, among other things, the patient verbalizing uncertainty or concern about undesired outcomes, expressing concern about choice consistency with personal values and/or exhibiting behavior such as wavering, delay, preoccupation, distress or tension. Generational and cultural influencers may act to inhibit the patient from actively participating in care discussions, often patients need to be given “permission” to participate as partners in making decisions about his/her care.

Support resources may include health care professionals, family, friends, support groups, clergy and social workers. When the patient expresses a need for information regarding options and his/her potential outcomes, the patient should understand the key facts about options, risks and benefits, and have realistic expectations. The method and pace with which this information is provided to the patient should be appropriate for the patient’s capacity at that moment.

• **Advance Care Planning**: With the diagnosis of a life-limiting illness, conversations around advance care planning open up. This is an opportune time to expand the scope of the conversation to other types of decisions that will need to be made as a consequence of the diagnosis.

• **Consideration of Values**: The personal importance a patient assigns potential outcomes must be respected. If the patient is unclear how to prioritize the preferences, value clarification can be achieved through a Collaborative Conversation™ and by the use of decision aids that detail the benefits and harms of potential outcomes in terms the patient can understand.

• **Trust**: The patient must feel confident that his/her preferences will be communicated and respected by all caregivers.

• **Care Coordination**: Should the patient require care coordination, this is an opportune time to discuss the other types of care-related decisions that need to be made. These decisions will most likely need to be revisited often. Furthermore, the care delivery system must be able to provide coordinated care throughout the continuum of care.

• **Responsive Care System**: The care system needs to support the components of patient- and family-centered care so the patient’s values and preferences are incorporated into the care he/she receives throughout the care continuum.

The Collaborative Conversation™ Map is the heart of this process. The Collaborative Conversation™ Map can be used as a stand-alone tool that is equally applicable to clinicians and patients as shown in
Table 2. Clinicians use the map as a clinical workflow. It helps get the Shared Decision-Making process initiated and provides navigation for the process. Care teams can use the Collaborative Conversation™ to document team best practices and to formalize a common lexicon. Organizations can build fields from the Collaborative Conversation™ Map in electronic medical records to encourage process normalization. Patients use the map to prepare for decision-making, to help guide them through the process and to share critical information with their loved ones.

**Evaluating the Decision Quality**

Adapted from O’Connor, Jacobsen “Decisional Conflict: Supporting People Experiencing Uncertainty about Options Affecting Their Health” [2007].

When the patient and family understand the key facts about the condition and his/her options, a good decision can be made. Additionally, the patient should have realistic expectations about the probable benefits and harms. A good indicator of the decision quality is whether or not the patient follows through with his/her chosen option. There may be implications of the decision on patient’s emotional state such as regret or blame, and there may be utilization consequences.

Decision quality can be determined by the extent to which the patient’s chosen option best matches his/her values and preferences as revealed through the Collaborative Conversation™ process.

Support for this project was provided in part by a grant from the Robert Wood Johnson Foundation.
ICSI has long had a policy of transparency in declaring potential conflicting and competing interests of all individuals who participate in the development, revision and approval of ICSI guidelines and protocols.

In 2010, the ICSI Conflict of Interest Review Committee was established by the Board of Directors to review all disclosures and make recommendations to the board when steps should be taken to mitigate potential conflicts of interest, including recommendations regarding removal of work group members. This committee has adopted the Institute of Medicine Conflict of Interest standards as outlined in the report, Clinical Practice Guidelines We Can Trust (2011).

Where there are work group members with identified potential conflicts, these are disclosed and discussed at the initial work group meeting. These members are expected to recuse themselves from related discussions or authorship of related recommendations, as directed by the Conflict of Interest committee or requested by the work group.

The complete ICSI policy regarding Conflicts of Interest is available at http://bit.ly/ICSICOI.

**Funding Source**

The Institute for Clinical Systems Improvement provided the funding for this guideline revision. ICSI is a not-for-profit, quality improvement organization based in Bloomington, Minnesota. ICSI's work is funded by the annual dues of the member medical groups and five sponsoring health plans in Minnesota and Wisconsin. Individuals on the work group are not paid by ICSI but are supported by their medical group for this work.

ICSI facilitates and coordinates the guideline development and revision process. ICSI, member medical groups and sponsoring health plans review and provide feedback but do not have editorial control over the work group. All recommendations are based on the work group's independent evaluation of the evidence.
Disclosure of Potential Conflicts of Interest

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Financial/Non-Financial Conflicts of Interest: None |

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All ICSI documents are available for review during the revision process by member medical groups and sponsors. In addition, all members commit to reviewing specific documents each year. This comprehensive review provides information to the work group for such issues as content update, improving clarity of recommendations, implementation suggestions and more. The specific reviewer comments and the work group responses are available to ICSI members at http://bit.ly.Labors.

The ICSI Patient Advisory Council meets regularly to respond to any scientific document review requests put forth by ICSI facilitators and work groups. Patient advisors who serve on the council consistently share their experiences and perspectives in either a comprehensive or partial review of a document, and engaging in discussion and answering questions. In alignment with the Institute of Medicine's triple aims, ICSI and its member groups are committed to improving the patient experience when developing health care recommendations.

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Acknowledgements

ICSI Patient Advisory Council

The work group would like to acknowledge the work done by the ICSI Patient Advisory Council in reviewing the Management of Labor guideline and thank them for their suggestions regarding improved communication and shared decision-making between the pregnant patient and her clinicians during labor and delivery.

Invited Reviewers

During this revision, the following groups reviewed this document. The work group would like to thank them for their comments and feedback.

Hennepin County Medical Center, Minneapolis, MN
Mayo Clinic, Rochester, MN

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Document History and Development:

Management of Labor

Document History

In July of 2005, this guideline was created as a result of merging the following ICSI guidelines:

- Management of Preterm Birth
- Intrapartum Fetal Heart Rate Management
- Failure to Progress in Labor
- Management of Vaginal Birth After Cesarean Labor

In May of 2011, the order set for Management of Labor was incorporated into the body of the guideline.

Original Work Group Members

The Management of Labor guideline is the result of merging the Preterm Birth Prevention (Preterm), Intrapartum Fetal Heart Rate Monitoring (IFHRM), The Prevention, Diagnosis and Treatment of Failure to Progress in Obstetrical Labor (FTP), and Vaginal Birth after Caesarean (VBAC) guidelines.

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ICSI Document Development and Revision Process

Overview

Since 1993, the Institute for Clinical Systems Improvement (ICSI) has developed more than 60 evidence-based health care documents that support best practices for the prevention, diagnosis, treatment or management of a given symptom, disease or condition for patients.

Audience and Intended Use

The information contained in this ICSI Health Care Guideline is intended primarily for health professionals and other expert audiences.

This ICSI Health Care Guideline should not be construed as medical advice or medical opinion related to any specific facts or circumstances. Patients and families are urged to consult a health care professional regarding their own situation and any specific medical questions they may have. In addition, they should seek assistance from a health care professional in interpreting this ICSI Health Care Guideline and applying it in their individual case.

This ICSI Health Care Guideline is designed to assist clinicians by providing an analytical framework for the evaluation and treatment of patients, and is not intended either to replace a clinician's judgment or to establish a protocol for all patients with a particular condition.

Document Development and Revision Process

The development process is based on a number of long-proven approaches and is continually being revised based on changing community standards. The ICSI staff, in consultation with the work group and a medical librarian, conduct a literature search to identify systematic reviews, randomized clinical trials, meta-analysis, other guidelines, regulatory statements and other pertinent literature. This literature is evaluated based on the GRADE methodology by work group members. When needed, an outside methodologist is consulted.

The work group uses this information to develop or revise clinical flows and algorithms, write recommendations, and identify gaps in the literature. The work group gives consideration to the importance of many issues as they develop the guideline. These considerations include the systems of care in our community and how resources vary, the balance between benefits and harms of interventions, patient and community values, the autonomy of clinicians and patients and more. All decisions made by the work group are done using a consensus process.

ICSI's medical group members and sponsors review each guideline as part of the revision process. They provide comment on the scientific content, recommendations, implementation strategies and barriers to implementation. This feedback is used by and responded to by the work group as part of their revision work. Final review and approval of the guideline is done by ICSI's Committee on Evidence-Based Practice. This committee is made up of practicing clinicians and nurses, drawn from ICSI member medical groups.

Implementation Recommendations and Measures

These are provided to assist medical groups and others to implement the recommendations in the guidelines. Where possible, implementation strategies are included that have been formally evaluated and tested. Measures are included that may be used for quality improvement as well as for outcome reporting. When available, regulatory or publicly reported measures are included.

Document Revision Cycle

Scientific documents are revised every 12-24 months as indicated by changes in clinical practice and literature. ICSI staff monitors major peer-reviewed journals every month for the guidelines for which they are responsible. Work group members are also asked to provide any pertinent literature through check-ins with the work group midcycle and annually to determine if there have been changes in the evidence significant enough to warrant document revision earlier than scheduled. This process complements the exhaustive literature search that is done on the subject prior to development of the first version of a guideline.

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