

Safe Deliveries Roadmap

Advancing Safety for Mothers and Babies
A Roadmap from Pre-pregnancy to Postpartum

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Washington State
Hospital Association

Best Practice Recommendations for Labor and Delivery Care

“The Best Health and Care for Moms and Babies”

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Foundation for Healthy Generations
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Overview

Call to Action

The U.S. is the only developed nation with a rising maternal mortality rateⁱ, and severe maternal morbidities are increasingly common in recent decadesⁱⁱ. Our infant mortality rate and preterm birth rate are higher than in most developed countries^{iii, iv}. These facts persist even though the total amount spent on health care in the U.S. is greater than in any other country^v, with childbirth being one of the highest areas of hospitalization costs^{vi}. Although Washington State compares favorably to national averages, disparities between sub-populations and suboptimal care scenarios persist, and women and babies continue to suffer preventable morbidity and mortality^{vii}.

Through the Safe Deliveries Roadmap initiative, the Washington State Hospital Association (WSHA) and its partners aim to improve maternal and infant outcomes by establishing and promoting evidence-based* best practices for care across four phases of the perinatal continuum:

- Pre-pregnancy
- Pregnancy
- Labor and Delivery
- Postpartum

- i. Kassebaum NJ, et. al. [Global, regional, and national levels and causes of maternal mortality during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013](#). The Lancet. Sept. 2014; 384 (9947): 980–1004.
- ii. Callaghan WM, Creanga AA, Kuklina EV. [Severe maternal morbidity among delivery and postpartum hospitalizations in the United States](#). Obstet Gynecol. Nov. 2012; 120 (5): 1029-36.
- iii. MacDorman MF, Mathews TJ, Mohangoo AD, Zeitlin J. [International comparisons of infant mortality and related factors: United States and Europe, 2010](#). National vital statistics reports. 2014; 63 (5). Hyattsville, MD: National Center for Health Statistics.
- iv. March of Dimes, PMNCH, Save the Children, WHO. [Born Too Soon: The Global Action Report on Preterm Birth](#). Eds Howson CP, Kinney MV, Lawn JE. World Health Organization. Geneva, 2012.
- v. Davis K, Stremikis K, Schoen C, Squires D. [Mirror, Mirror on the Wall, 2014 Update: How the U.S. Health Care System Compares Internationally](#). June 2014: The Commonwealth Fund.
- vi. Moore B, Levit K, Elixhauser A. [Costs for hospital stays in the United States, 2012](#). HCUP Statistical Brief #181. October 2014. Agency for Healthcare Research and Quality, Rockville, MD.
- vii. Washington State Department of Health. [Infant mortality](#). Updated Mar. 7, 2013.

About the Safe Deliveries Roadmap Recommendations

The recommendations are universally relevant for all women and newborns. Recommendations for care specific to select special populations (those with certain health conditions or making certain health-related choices) that are relatively common or likely to be subject to variations in current care practices are also included in the “Special Considerations” sections throughout. Physical examinations, patient health self-assessments, and complete health and family history-taking are established as foundations of primary care, and therefore are not specified in these recommendations.

The recommendations are aspirational – they outline the ideal care for optimal health outcomes. They are meant to be adaptable to the changing healthcare landscape. New care models such as team approaches and telemedicine may support implementation of the recommended practices.

The recommendations, tips, tools and resources provided in this toolkit reflect the best evidence as of 2014 and the input of expert clinicians and leaders in health care delivery and public health with expertise in women’s health, obstetrics, midwifery, neonatology, pediatrics, family practice, and health promotion. They will be reviewed and updated as evidence changes, with a full review planned every 2-3 years.

* The Society for Maternal and Fetal Medicine’s grading system ([http://www.ajog.org/article/S0002-9378\(13\)00744-8/fulltext](http://www.ajog.org/article/S0002-9378(13)00744-8/fulltext)) was used as a model; recommendations meeting any level of evidence were allowed to be included.

Vision for the Future

- Women and their families are informed on and engaged in care related to the topics covered by these recommendations.
- Providers and healthcare systems identify and meet each patient’s needs to optimize health outcomes.
 - Care is always culturally appropriate and relevant to each patient. (i.e. Services are responsive to patients’ gender, race/ethnicity, sexual orientation, age, stage, cognitive ability, language, and cultural beliefs.)
- All women and infants have access to care through coverage and primary care medical/health homes.
- Health equity and social determinants of health are addressed to enable optimal health attainment.

Summary of Labor and Delivery Care Recommendations

1. Prenatal Care: Assessment of Gestational Age

- Provide documentation on how and when gestational age determined.

2a. Labor Induction: Pre-Procedure

- Consent form discussed with patient and signed for any induction; medical and non-medical.

2b. Labor Induction: Non-Medically Indicated

- Not done prior to 39 weeks gestation.
- Between 39 – 40 6/7 weeks gestation: must have Bishop score of 9 or greater in nulliparous women and 6 or greater in multiparous women (no cervical ripening).

2c. Labor Induction: Medically Indicated

- Done for reasons that are medically indicated and not included in the non-medically indicated guideline.
- Cervical ripening if needed for unfavorable cervix.

2d. Labor Induction: Failed Induction

- No cervical change after 24 hours of oxytocin and membranes have been artificially ruptured.
- Failure to enter active phase despite uterine contractions every 3 mins x 24 hours with ruptured membranes.
- Inadequate response to 2nd cervical ripening agent *and* failure to respond to oxytocin per hospital protocol.
- In the setting of ruptured membranes, no cervical change after 12 hours of oxytocin.

3a. Labor – First Stage: Delay Admission to Labor Unit

- Cervix less than 4 cm.
- Membranes intact.
- Reactive nonstress test/fetal heart rate category I (if uterine contractions present) confirmed by 2 practitioners.

- Pain control adequate with appropriate outpatient interventions as needed

Note: For spontaneous labor use all recommendations. For induction of labor entering active phase only use last recommendation.

3b. Labor – First Stage: Consider Discharge Home or Further Observation

- Cervix 4-5 cm without change x 2 - 4 hours.
- Less than 80% effacement.
- Membranes intact.
- Reactive NST/FHR category I (if uterine contractions present).
- Contractions less than 3/10 minutes.

Note: For spontaneous labor only.

3c. Labor – First Stage: Consider Artificial Rupture of Membranes

- Cervix 4-5 cm without change x 2- 4 hours.
- 90 – 100% effacement.
- Membranes intact.
- Reactive NST/FHR category I (if uterine contractions present).
- Contractions less than 3/10 minutes.

Note: For spontaneous labor only.

3d. Labor – First Stage: Consider Cesarean Delivery

- Cervix 6 cm or greater.
- Membranes ruptured (if feasible).
- Arrest of cervical dilation and uterine activity.

Note: For spontaneous labor and induction of labor entering active phase.

4a. Labor – Second Stage: Assessment of Descent and Position of Presenting Part

- At least every 1- 2 hours.

4b. Labor – Second Stage: Consider Operative Vaginal Delivery or Cesarean Delivery

- Time from complete dilation:
 - Nulliparous with epidural anesthesia – 4 hours.
 - Nulliparous without epidural anesthesia – 3 hours.
 - Multiparous with epidural – 3 hours.
 - Multiparous without epidural – 2 hours.

OR

- Total time from complete dilation 5 hours or greater.
- Greater than 2 hrs, adequate pattern, no descent.

5a. Labor – All Phases: Assessment of Fetal Status

- Use FHR interpretation algorithm.

5b. Labor – All Phases: Staffing

- 1:1 nurse to patient staffing ratios in active labor, high risk, or being induced.

5c. Labor – All Phases: Mode of Fetal Monitoring

- Provide ability to palpate contractions and auscultate FHR in appropriate populations.

Topic 1: Prenatal Care: Assessment of Gestational Age

Recommendations

- Provide documentation on how and when gestational age determined (most recent American Congress of Obstetricians and Gynecologists (ACOG) criteria, see ACOG Committee Opinion No. 611)

Special Considerations

- 1st trimester ultrasound dating is most accurate when a clearly visualized crown-rump length (CRL) can be measured.

References

(1-11)

Topic 2a: Labor Induction: Pre-Procedure

Recommendations

- Consent form discussed with patient and signed for any induction; medical and non-medical (ACOG induction consent or equivalent)

References

(4; 10; 12-14)

Topic 2b: Labor Induction: Non-Medically Indicated

Recommendations

- Not done prior to 39 weeks gestation
- Between 39 – 40 6/7 weeks gestation. Must have Bishop score of 9 or greater in nulliparous women and 6 or greater in multiparous women (no cervical ripening)

References

(4; 7; 15-28)

Topic 2c: Labor Induction: Medically Indicated

Recommendations

- Done for reasons that are medically indicated and not included in the non-medically indicated guideline (Appendix A)
- Cervical ripening if needed for unfavorable cervix

References

(4; 6; 13-14; 16-17; 29-31)

Topic 2d: Labor Induction: Failed Induction (assuming stable mother and fetus)—parameters to use when not entering active labor (≥ 6 cms)

Recommendations

- No cervical change after 24 hours of oxytocin and membranes have been artificially ruptured (if feasible and no contraindications)
- Failure to enter active phase (6 cms) despite uterine contractions every 3 mins x 24 hours with ruptured membranes
- Inadequate response to 2nd cervical ripening agent *and* failure to respond to oxytocin per hospital protocol
- In the setting of ruptured membranes, no cervical change after 12 hours of oxytocin

Special Considerations

- If failed induction with intact membranes and Group B streptococcus (GBS) negative, discuss options regarding further management: consider risks, benefits, and alternatives of all options (i.e: discharge home with plan to return versus cesarean section, depending on clinical situation)

References

(16; 26; 32-36)

Topic 3a: Labor- First Stage: Delay Admission to Labor Unit

Note: For spontaneous labor use all recommendations. For induction of labor entering active phase only use last recommendation.

Recommendations

- Cervix less than 4 cm
- Membranes intact
- Reactive nonstress test/fetal heart rate (NST/FHR) category I (if uterine contractions present) confirmed by 2 practitioners (RN, MD, DO, CNM)
- Pain control adequate with appropriate outpatient interventions as needed

References

(26)

Topic 3b: Labor- First Stage: Consider Discharge Home or Further Observation

Note: For spontaneous labor only.

Recommendations

- Cervix 4-5 cm without change x 2 - 4 hours
- Less than 80% effacement
- Membranes intact
- Reactive NST/FHR category I (if uterine contractions present)
- Contractions less than 3/10 minutes

References

(26)

Topic 3c: Labor- First Stage: Consider Artificial Rupture of Membranes (AROM) and/or Oxytocin Administration

Note: For spontaneous labor only.

Recommendations

- Cervix 4-5 cm without change x 2- 4 hours
- 90 – 100% effacement
- Membranes intact
- Reactive NST/FHR category I (if uterine contractions present)
- Contractions less than 3/10 minutes

References

(26; 34-39)

Topic 3d: Labor- First Stage: Consider Cesarean Delivery (All Three Present)

Note: For spontaneous labor and induction of labor entering active phase.

Recommendations

- Cervix 6 cm or greater
- Membranes ruptured (if feasible)
- Arrest of cervical dilation and uterine activity (see special considerations for parameters)

Special Considerations

- Arrest of cervical dilation and uterine activity documented as:
 - Adequate (>200 Montevideo units or palpably strong > q 3 minutes when not feasible to rupture membranes) with no or minimal cervical change x 4hr ***
 - OR
 - Inadequate (<200 Montevideo Units or <3/10 minutes despite oxytocin per protocol) with no or minimal cervical change X 6hr***

*** Clinical judgment is needed to determine safe upper limit of total time allowed in active phase ≥ 6 cm to < 10cm. "Minimal cervical change" would be substantially less than clinical norm, for example, less than or equal to 1 cm change in 4 - 6 hours. Per the Zhang et al. partogram at 6cm the 95th percentile for a normal active labor phase curve and normal outcomes is approximately 8 hrs total time

References

(16; 26; 40)

Topic 4a: Labor- Second Stage: Assessment of Descent and Position of Presenting Part

Recommendations

- At least every 1- 2 hours

References

(26)

Topic 4b: Labor- Second Stage: Consider Operative Vaginal Delivery or Cesarean Delivery (If Presenting Part Not On Perineal Floor: +4 or Lower)

Recommendations

- Time from complete dilation*/**:
 - Nulliparous with epidural anesthesia – 4 hours
 - Nulliparous without epidural anesthesia – 3 hours
 - Multiparous with epidural – 3 hours
 - Multiparous without epidural – 2 hoursOR
 - Total time from complete dilation 5 hours or greater
 - Greater than 2 hrs, adequate pattern, no descent

Special Considerations

*Passive descent (laboring down) is included in these time periods.

** Each may need an additional hour if occiput posterior position and rotation of greater than 45 degrees toward anterior has been previously achieved.

References

(16; 26)

Topic 5a: Labor- All Phases: Assessment of Fetal Status

Recommendations

- Use FHR interpretation algorithm (e.g. Spong, Clark) (Appendix B and C)

References

(26)

Topic 5b: Labor- All Phases: Staffing

Recommendations

- 1:1 nurse to patient staffing ratios in active labor (greater than or equal to 6 cm AND 80% effaced) high risk or being induced

Topic 5c: Labor- All Phases: Mode of Fetal Monitoring

Recommendations

- Provide ability to palpate contractions and auscultate FHR in appropriate populations

Reference List

1. Abuhamad AZ. The American College of Obstetricians and Gynecologists. Ultrasonography in pregnancy. Practice Bulletin No. 101. Obstet Gynecol. 2009 Feb; 113 (2 Pt 1): 451-61. Reaffirmed 2011. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/19155920>
2. American Academy of Pediatrics and The American College of Obstetricians and Gynecologists. Guidelines for Perinatal Care, 7th Edition. 2012. Retrieved from <http://sales.acog.org/eBook-Guidelines-for-Perinatal-Care-Seventh-Edition-P729.aspx>
3. The American College of Obstetricians and Gynecologists. Fetal lung maturity. Practice Bulletin No. 97. Obstet Gynecol. 2008 Sep; 112(3): 717-26. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/18757686>
4. The American College of Obstetricians and Gynecologists. Induction of labor. Practice Bulletin No. 107. Obstet Gynecol. 2009 Aug; 114(2 Pt. 1): 386-97. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/19623003>
5. The American College of Obstetricians and Gynecologists. Method for Estimating Due Date. Committee Opinion No. 611. Obstet Gynecol. 2014 Oct; 124:863-6. Retrieved from <http://www.acog.org/-/media/Committee-Opinions/Committee-on-Obstetric-Practice/co611.pdf?dmc=1&ts=20150504T2056572256>
6. The American College of Obstetricians and Gynecologists & Society for Maternal-Fetal Medicine. Medically indicated late-preterm and early-term deliveries. Committee Opinion No. 560. Obstet Gynecol. 2013 April; 121:908-10. Retrieved from <http://www.acog.org/-/media/Committee-Opinions/Committee-on-Obstetric-Practice/co560.pdf?dmc=1&ts=20150504T2058582103>
7. The American College of Obstetricians and Gynecologists & Society for Maternal-Fetal Medicine. Nonmedically indicated early-term deliveries. Committee Opinion No. 561. Obstet Gynecol. 2013 April; 121:911-5. Retrieved from <http://www.acog.org/-/media/Committee-Opinions/Committee-on-Obstetric-Practice/co561.pdf?dmc=1&ts=20150504T2100442261>
8. Hadlock FP, Deter RL, Harrist RB, Park SK. Estimating fetal age: Computer-assisted analysis of multiple fetal growth parameters. Radiol. 1984 Aug; 152:497-501. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/6739822>
9. Joint Commission. Perinatal care core measure set. Oakbrook Terrace, IL. 2014 October 16. Retrieved from http://www.jointcommission.org/perinatal_care/
10. Joint Commission. 2015 Comprehensive accreditation manual for hospitals. Oakbrook Terrace, IL. 2014 Nov. Retrieved from <http://www.jcrinc.com/2015-comprehensive-accreditation-manuals/2015-comprehensive-accreditation-manual-for-hospitals-camh-/>
11. Savitz DA, Terry JW, Dole N, Thorp JM, Siega-Riz AM, Herring AH. Comparison of pregnancy dating by last menstrual period, ultrasound scanning and their combination. Am J Obstet Gynecol. 2002; 187(6):1660-66. Retrieved from <http://www.ajog.org/article/S0002-9378%2802%2900487-8/abstract>
12. The American College of Obstetricians and Gynecologists. Informed consent. Committee Opinion No. 439. Obstet Gynecol. 2009 Aug; 114: 401-8. Retrieved from <http://www.acog.org/-/media/Committee-Opinions/Committee-on-Ethics/co439.pdf?dmc=1&ts=20150504T2112253056>

13. The American College of Obstetricians and Gynecologists. Inpatient induction of labor. Patient Safety Checklist No. 2. *Obstet Gynecol.* 2011; 118:1205-6. Retrieved from <http://www.acog.org/-/media/Patient-Safety-Checklists/psc002.pdf?dmc=1&ts=20150504T2114037901>
14. The American College of Obstetricians and Gynecologists. Scheduling induction of labor. Patient Safety Checklist No. 5. *Obstet Gynecol* 2011 Dec; 118: 1473-4. Retrieved from <http://www.acog.org/-/media/Patient-Safety-Checklists/psc005.pdf?dmc=1&ts=20150504T2114037901>
15. The American College of Obstetricians and Gynecologists. Choosing wisely: Five things physicians and patients should question. 2013 Feb 21. Retrieved from <http://www.choosingwisely.org/doctor-patient-lists/american-college-of-obstetricians-and-gynecologists/>
16. The American College of Obstetricians and Gynecologists. Safe prevention of the primary cesarean delivery. *Obstetric Care Consensus No. 1. Obstet Gynecol.* 2014 March;123:693–711. Retrieved from <http://www.acog.org/Resources-And-Publications/Obstetric-Care-Consensus-Series/Safe-Prevention-of-the-Primary-Cesarean-Delivery>
17. Bishop, EH. Pelvic scoring for elective induction. *Obstet Gynecol.* 1964; 24(2): 266–268.
18. Clark SL, Miller DD, Belfort MA, Dildy GA, Frye DK, Meyers JA. Neonatal and maternal outcomes associated with elective term delivery. *American Journal of Obstetrics and Gynecology.* 2009 Feb; 200(2): 156.e1–156.e4. Retrieved from <http://www.ajog.org/article/S0002-9378%2808%2901037-5/abstract>
19. Clark SL, Frye DR, Meyers JA, et al. Reduction in elective delivery <39 weeks of gestation: Comparative effectiveness of 3 approaches to change and the impact on neonatal intensive care admission and stillbirth. *American Journal of Obstetrics and Gynecology.* 2010 Nov; 203(5), 449.e1–449.e6. Retrieved from <http://www.ajog.org/article/S0002-9378%2810%2900679-4/pdfSummary>
20. Jonsson M, Cnattingius S, Wikström AK. Elective induction of labor and the risk of Cesarean section in low-risk parous women: a cohort study. *Acta Obstet Gynecol Scand.* 2013 Feb; 92:198-203. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/23157554>
21. Laughon, S. K., Zhang, J., Troendle, J., Sun, L., & Reddy, U. Using a Simplified Bishop Score to Predict Vaginal Delivery. *Obstet Gynecol.* 2012 Mar; 117 (4): 805-811. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3297470/>
22. Macones GA. Elective Induction of Labor: Waking the Sleeping Dogma? *Ann Intern Med.* 2009 Aug; 151(4):281-282. Retrieved from <http://annals.org/article.aspx?articleid=744668>
23. Oshiro BT, Branch DW, Varner MW, Dizon-Townson D, Henry E, Millar J. Reducing elective inductions in nulliparas with an unfavorable cervix in a health care system. *Obstetrics & Gynecology.* 2005 Apr; 105(4): 82S. Retrieved from http://journals.lww.com/greenjournal/Citation/2005/04001/Reducing_Elective_Inductions_in_Nulliparas_With_an.187.aspx
24. Reddy UM, Bettgowda VR, Dias T, Yamada-Kushnir T, Ko CW, Willinger M. Term pregnancy: A period of heterogeneous risk for infant mortality. *Obstet Gynecol.* 2011 Jun; 117(6), 1279-1287. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/21606738>
25. Reisner DP, Wallin TK, Zingheim RW, Luthy DA. Reduction of elective inductions in a large community hospital. *American Journal of Obstetrics and Gynecology.* 2009 Jun; 200(6): 674.e1-674.e7. Retrieved from <http://www.ajog.org/article/S0002-9378%2809%2900210-5/abstract>
26. Spong CY, Berghella V, Wenstrom KD, Mercer BM, Saade GR. Preventing the first cesarean delivery: Summary of a joint Eunice Kennedy Shriver National Child Health and Human Development, Society for Maternal-Fetal Medicine, and American College of Obstetricians and Gynecologists workshop. *Obstet Gynecol.* 2012 Nov; 120(5): 1181-1193. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3548444/>
27. Tita ATN, Landon MB, Spong CY, et al. for the Eunice Kennedy Shriver NICHD Maternal–Fetal Medicine Units Network. Timing of elective repeat cesarean delivery at term and neonatal outcomes. *New England Journal of Medicine.* 2009 Jan; 360(2): 111–120. Retrieved from <http://www.nejm.org/doi/full/10.1056/NEJMoa0803267>
28. Yeast JD, Jones A, Poskin M. Induction of labor and the relationship to cesarean delivery: A review of 7001 consecutive inductions. *American Journal of Obstetrics & Gynecology.* 1999 Mar; 180(3 Pt 1): 628 – 633. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/10076139>

29. Jozwiak M, Bloemenkamp KW, Kelly AJ, Mol BW, Irion O, Bouvain M. Mechanical methods for induction of labour. Cochrane Database of Systematic Reviews. 2012 Mar; 3:CD001233. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/22419277>
30. Northern New England Perinatal Quality Improvement Network (NNEPQIN): Elective Labor Induction Guidelines. 2012. Retrieved from <http://www.nnepqin.org/Guidelines.asp>
31. Spong CY, Mercer BM, D'alton M, Kilpatrick S, Blackwell S, Saade G. Timing of indicated late-preterm and early-term birth. *Obstet Gynecol*. 2011 Aug; 118(2, Pt. 1): 323-333. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/21775849>
32. Harper LM, Caughey AB, Odibo AO, Roehl KA, Zhao Q, Cahill AG. Normal progress of induced labor. *Obstet Gynecol*. 2012 Jun; 119(6): 1113-1118. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/22569121>
33. Laughon SK, Branch DW, Beaver J, Zhang J. Changes in labor patterns over 50 years. *American Journal of Obstetrics and Gynecology*. 2012 May; 206(5): 419.e1-9. Retrieved from <http://www.ajog.org/article/S0002-9378%2812%2900273-6/abstract>
34. Rouse DJ, Owen J, Savage KG, Hauth JC. Active phase labor arrest: Revisiting the 2-hour minimum. *Obstet Gynecol*. 2001 Oct; 98(4): 550-554. Retrieved from http://journals.lww.com/greenjournal/Fulltext/2001/10000/Active_Phase_Labor_Arrest_Revisiting_the_2_Hour.5.aspx
35. Rouse DJ, Weiner SJ, Bloom SL, et al. for the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) Maternal- Fetal Medicine Units Network (MFMU). Failed labor induction: toward an objective diagnosis. *Obstet Gynecol*. 2011 Feb; 117(2, pt. 1): 267-272. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/21252738>
36. Simon CE, Grobman WA. When Has an Induction Failed? *Obstet Gynecol*. 2005 April: 105(4): 705-709. Retrieved from http://journals.lww.com/greenjournal/Fulltext/2005/04000/When_Has_an_Induction_Failed_.5.aspx
37. Zhang J, Landy HJ, Branch DW, et al. for the Consortium on Safe Labor. Contemporary patterns of spontaneous labor with normal neonatal outcomes. *Obstet Gynecol*. 2010 Dec; 116(6): 1281-1287. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/21099592>
38. Zhang J, Troendle J, Mikolajczyk R, Sundaram R, Beaver J, Fraser W. The natural history of the normal first stage of labor. *Obstet Gynecol*. 2010 Apr; 115(4): 705-710. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/20308828>
39. Zhang J, Troendle JF, Yancey MK. Reassessing the labor curve in nulliparous women. *American Journal of Obstetrics and Gynecology*. 2002 Oct; 187(4): 824-828. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/12388957>
40. Clark SL, Nageotte MP, Garite TJ. Intrapartum management of category II fetal heart rate tracings: towards standardization of care. *American Journal of Obstetrics and Gynecology*. 2013 Aug; 209(2): 89-97. Retrieved from <http://www.ajog.org/article/S0002-9378%2813%2900405-5/abstract>

Appendix A: Guideline Criteria for Non-medically Indicated Labor Induction

Guideline Criteria for Non-medically Indicated Labor Induction

(Adapted from Northern New England Perinatal Quality Improvement Network (NNEPQIN)
<http://www.nnepqin.org/Guidelines.asp>)

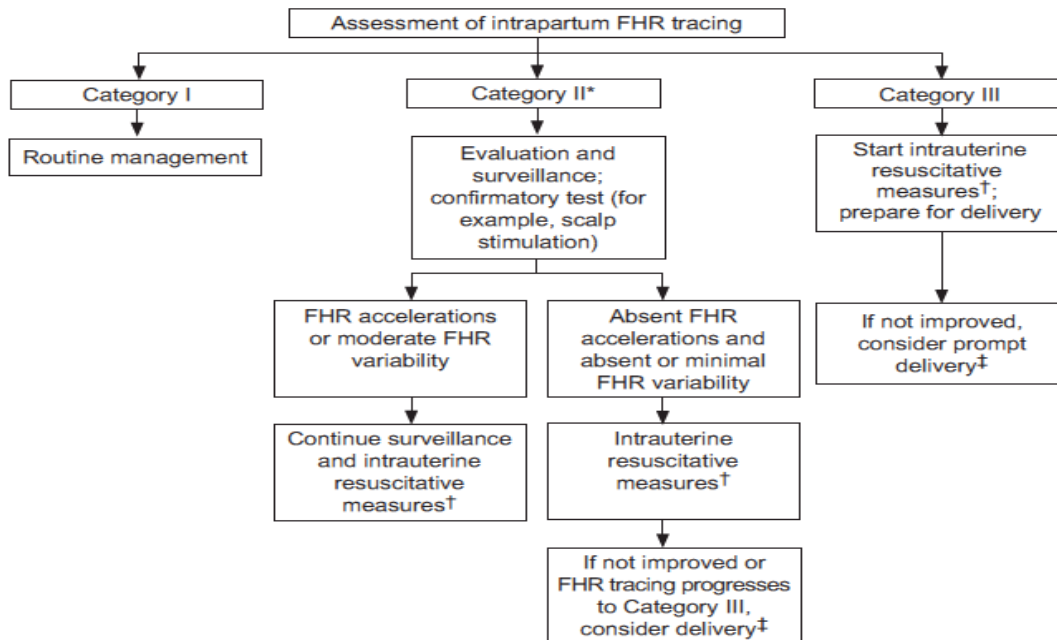
Non-medically indicated induction definition:

Labor Induction without clear medical benefits to mother or fetus at that point in time compared with continuation of pregnancy.

Indications that make the induction elective:

- History of fast labor
- Distance from hospital
- Suspected macrosomia (without history of shoulder dystocia)
- Psychosocial (e.g. partner's deployment date, family or significant relation availability, adoption, etc...)
- Maternal discomfort (e.g. hemorrhoids, reflux, sciatic nerve pain, fatigue, etc...)
- Advanced cervical dilation, GBS negative

Appendix B: Assessment of Intrapartum Fetal Heart Rate Tracing Algorithm

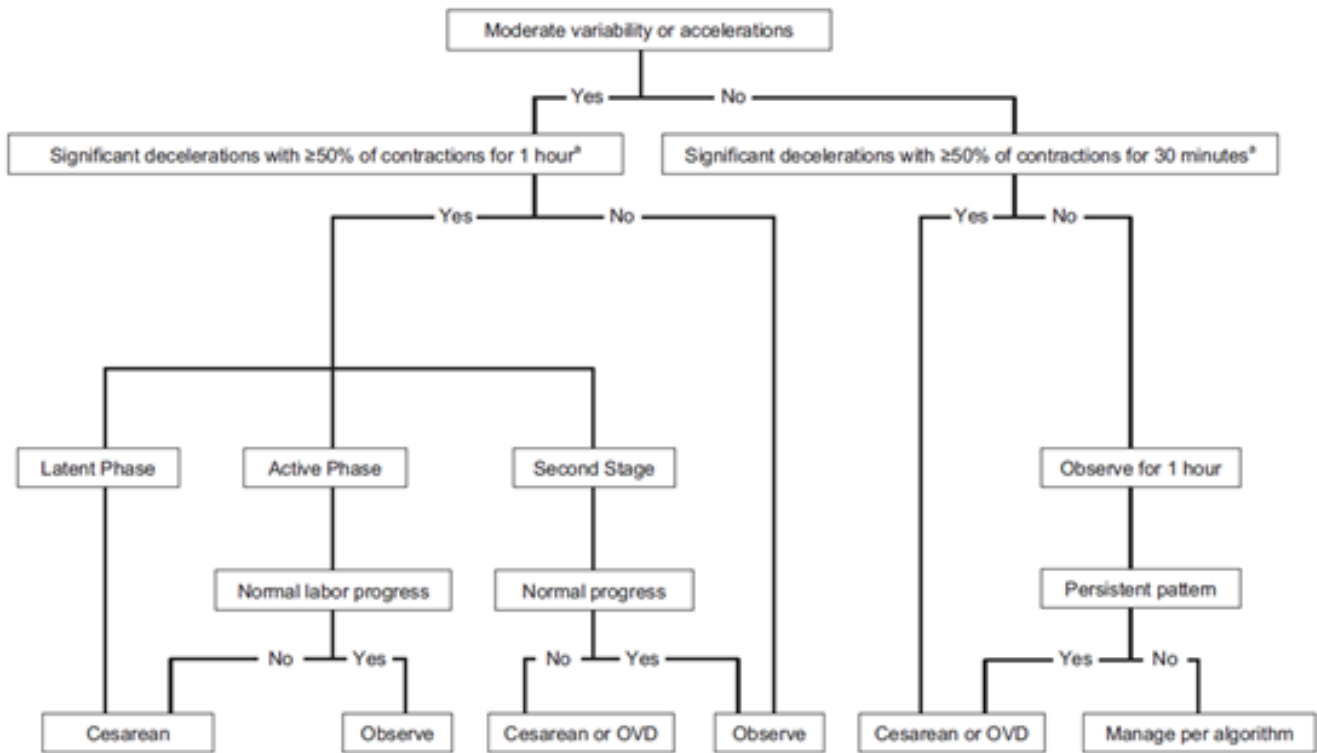


Spong, C. Y., Berghella, V., Wenstrom, K.D., Mercer, B.M. & Saade, G.R. (2012). Preventing the first Cesarean delivery: Summary of a joint Eunice Kennedy Shriver National Institute of Child Health and Human Development, Society for Maternal-Fetal Medicine and American College of Obstetricians and Gynecologists workshop. *Obstetrics & Gynecology*, 120(5): 1181-93.

Appendix C: Algorithm for Management of Category II Fetal Heart Rate Tracings

FIGURE 1

Algorithm for management of category II fetal heart rate tracings



OVD, operative vaginal delivery.

^aThat have not resolved with appropriate conservative corrective measures, which may include supplemental oxygen, maternal position changes, intravenous fluid administration, correction of hypotension, reduction or discontinuation of uterine stimulation, administration of uterine relaxant, amnioinfusion, and/or changes in second stage breathing and pushing techniques.

Clark. Category II FHRT. *Am J Obstet Gynecol* 2013.

Clark, S. L., Nageotte, M. P., Garite, T. J., Freeman, R. K., Miller, D. A. Simpson, K. R.Hankins G. D. V. (2013). Intrapartum management of category II fetal heart rate tracings: towards standardization of care. *American Journal of Obstetrics and Gynecology*, 209(2), 89-97. doi:10.1016/j.ajog.2013.04.030