Boston Medical Center Maternity Care Guideline
Guideline: INDUCTION OF LABOR
Accepted: 12/07/2017, 01/07/2019, 3/28/19
Updated: 07/2021
Authors: Kari Radoff CNM, Rosha Forman CNM, Sarah Crane MD, Ron Iverson MD, Jen Pfau MD, Glenn Markenson MD, Emily Rosenthal MD, Daphne Landau MD

Introduction

- In the absence of maternal or fetal indications delivery should not occur prior to 39 weeks. When fetal or maternal conditions arise indicating induction of labor shared decision making, informed consent, and evidence-based practice should be used for induction planning.

- Induction of labor may be indicated for maternal, fetal and obstetric indications. **Early delivery prior to 39 weeks is only recommended when certain criteria are met.** It is the OBGYN and Family Medicine department's goal to prevent elective delivery prior to 39 weeks. See Appendix I & II for ACOG recommendations for IOL and rates of stillbirth associated with maternal/fetal conditions.

Management of obstetric patients for induction of labor or delivery

- **Early delivery prior to 39 weeks**
    - Delivery prior to 39 weeks is only indicated when certain maternal, fetal and obstetric risks are present. Please link to the resource below for a list of exceptions to this rule. If you have questions, please consult with the Labor and Delivery Nurse Manager or the OB director of quality improvement.

Patients who may be admitted for immediate induction of labor:

- Spontaneous Rupture of Membranes at term (>37 weeks) and GBS+. PROM at term and GBS negative may use shared decision making for 24 hours of outpatient management versus immediate inpatient management per PROM management Policy.
- Premature Prelabor Rupture of Membranes (<37 weeks)
- Chorioamnionitis
- Gestational hypertension and/or Preeclampsia with or without severe features at term
- Gestational hypertension and/or Preeclampsia with or without severe features $\leq$ 37 weeks per MFM recommendation
- Fetal Demise
- Oligohydramnios: maximal vertical pocket of <2x2 $\geq$ 36 weeks.
- Non-Reassuring Fetal Testing

Patients who may be scheduled for induction of labor >37weeks gestational age:

- **Fetal Abnormalities**
- **Twin gestation**:
    - Uncomplicated di-di twins 37-38 weeks
    - Uncomplicated mono-di twins 36-37 weeks
    - Complicated twin gestation plan delivery timing with MFM consult
- **Gestational hypertension** and/or Preeclampsia without severe features at term at time of diagnosis
- **Chronic Hypertension on medications**, well controlled on medication, plan for induction of labor between 37-39 weeks
- **Prior pregnancy with fetal demise**, IOL after 39 weeks with shared decision making with patient, but may elect early term IOL (see appendix II)
- **Oligohydramnios**: Maximal vertical pocket of <2x2 $\underline{\geq}$ 36 weeks
    - MFM recommendation for IOL at time of diagnosis.
    - If no comorbidities, otherwise normal fetal testing, and patient declines IOL, use shared decision making for repeat fetal monitoring
- **Cholestasis:** See Appendix III: Diagnosis and Management of Intrahepatic Cholestasis of Pregnancy
    - Mild: total bile acids >10 <40: delivery at 38-39 weeks
    - Moderate bile acids 40-99: delivery 37w-38w
    - Severe: bile acids $\underline{\geq}$ 100, delivery at 36 weeks

- **Fetal Growth Restriction (FGR)** See Appendix IV for Algorithm on management of fetal growth Restriction.
    - FGR <10%tile
        - FGR >3%tile-10%tile OR **AC <10%tile**-> delivery 38-39 weeks
        - Severe <3%tile-> delivery at 37weeks or diagnosis if >37 weeks
        - FGR+ abnormal dopplers or concurrent condition-> see algorithm. MFM consult and individualized delivery plan (30-37w6d)

- **Diabetes**
    - Diet-Controlled GDM: There are no clear gestational age guidelines regarding induction for women with well-controlled gestational diabetes on diet alone. It is reasonable to induce these patients between 40-41 weeks. An ultrasound for EFW should be obtained at 37-38 weeks gestation for counseling about mode of delivery in the presence of suspected fetal macrosomia (EFW >4500 g at delivery).
    - GDM on medications: Patients with well-controlled gestational diabetes treated with oral medications or insulin are recommended to undergo induction of labor between 39 0/7-39 6/7 weeks
    - Type 2 Diabetes: well controlled induction of labor at 39 weeks
    - Poorly controlled diabetes plan delivery timing with MFM consult

Advanced Maternal Age

- At this time there are no national recommendations for early IOL for AMA, and no guideline at BMC. Shared decision making should be used when discussing elective IOL for AMA patients. (See Appendix IV)

- **Elective IOL >39 weeks (see Appendix IV)**
  - Shared decision making should be used when considering elective inductions

- **Gestation Greater than 41 weeks/Postdates pregnancy**
- ACOG, WHO, ACNM recommend IOL between 41-42 weeks. All recommend shared decision making.
  - **Expectant Management**
    Lower chance of tachysystole (48% vs 63%)
    Lower chance of pain medicaitons (49% vs 52%)
    Probably less time in the hospital
    Probably more satisfaction with care

  - **IOL between 41-42 weeks:**
    Lower chance of NICU admission (6% vs 5%)
    Lower chance of neonatal demise (1 vs 4 in 10,000) BOTH of these are <1%
    Probably lower chance of cesarean (11% vs 10%)

  - **IOL prior to 41 weeks:**
    No known benefits via meta-analysis
    No known additional risks at this time versus between 41-42 weeks
    May be personal reasons why early IOL is a valid choice

- **The following are not indications for labor induction:**
  - Falling off of the growth curve
  - Suspected Macrosomia
  - Any indicator that is not listed in the "Conditions possibly justifying elective delivery prior to 39 weeks gestation".

Logistical Practice for BMC and CHC providers

- Inductions of labor can be scheduled by calling the unit coordinator on Labor and Delivery at 617-414-4364. If unable to schedule the patient within a reasonable time frame please request to speak to the Charge Nurse or L&D Nurse Manager.
- Please have patients name, BMC MRN number, EDD, gestational age at time of IOL, and indication for IOL ready to provide to unit coordinator.
- Induction of labor for **postdates** between 41-42 weeks may be booked with the L&D unit coordinator when the patient has completed 40 weeks gestation. Patients should be scheduled for fetal testing after 41 weeks gestation.
- Access guidelines, consent forms, and patient letters at https://www.bumc.bu.edu/obgyn/ under Resources & Guidelines

Patient Education Materials

- See attached for patient education letters in English and Spanish for IOL.

- Patients should be advised to contact L&D prior to arrival for their IOL to ensure on time start. IOL dates sometimes need to be moved due to floor acuity.

B O S T O N M E D I C A L C E N T E R

Department of Obstetrics & Gynecology

Dear Patient,

Welcome to Boston Medical Center. We are very happy that you will have your baby with us. The date for your Induction of Labor is:

Date: _____

Time: _____

Place: Women and Infants Center, Yawkey Building, 4th Floor

Please register for your appointment at the desk on Labor and Delivery in the Yawkey building, 4th floor. We want to start your induction soon after you arrive. Sometimes it is very busy on the Labor and Deliver floor. You may have to wait before we can begin the induction. Rarely, we will call you to change your induction time.

Please remember:

- Your induction may take two to three days before your baby is born

-Eat before you come to BMC. There will be times during your induction when we will ask you not to eat.

- Bring any items that you may need for yourself or your baby (clothing, toothbrush, baby clothes, car seat, etc).

- Bring your identification, Health Insurance card, Health Care Proxy and Tubal Ligation Consent (if that is your plan).

- Let your Birth Sister[sm] know your induction time and day.

To learn more, talk to your provider. After office hours, please call (617) 414-2000.

Sincerely,

The Labor and Delivery Staff

[sm] Birth Sister is a registered service mark of Urban Midwife Associates and is used with permission.

B O S T O N M E D I C A L C E N T E R

Departamento de Obstetricia y Ginecología

Estimada Paciente:

Bienvenida a Boston Medical Center (BMC). Nos sentimos muy contentos de que usted venga nuestro hospital a tener a su bebé.

La cita para su inducción de parto es:

Fecha: _____

Hora: _____

Lugar: El Centro Materno Infantil, Yawkey Edificio 4ª Piso

Por favor, regístrese para su cita en el mostrador en el Centro Materno Infantil en el edificio de Yawkey, 4ª piso. Nosotros queremos comenzar la inducción de parto tan pronto que usted llegue. En ocasiones estamos muy ocupados en la unidad de partos. Puede que usted tenga que esperar antes de su inducción. En muy raras ocasiones le llamaremos para cambiar la cita de su inducción.

Por favor recuerde:

- La inducción puede durar varios días antes de que nazca su bebé.
- Comer antes de llegar al BMC. Usted no podrá comer luego de que comience la inducción.
- Traiga las cosas que usted o su bebé puedan necesitar. Por ejemplo: ropa, cepillo de dientes, ropa para el bebé, asiento para el bebé, etc).
- Traiga su identificación con foto, tarjeta de seguro médico, consentimiento para esterilización (si estos son sus planes), Health Care Proxy (documento para designar persona para tomar decisiones médicas de usted no poder).
- Si usted tiene Birth Sister[sm] (Hermana de Parto), dígale sobre su cita para la inducción.

Para obtener más información, hable con su proveedor. Llame al 617-414-2000 durante horas laborables.

Sinceramente,

Personal de la unidad de partos

References

Induction of Labor. ACOG Practice Bulletin No. 107. American College of Obstetricians and Gynecologists. Obstet Gynecol 2009;114:386-97.

American College of Obstetricians and Gynecologists Committee on Practice Bulletins—Obstetrics, Society for Maternal-Fetal Medicine Publications Committee. Fetal Growth Restriction: ACOG Practice Bulletin, Number 227. Obstet Gynecol. 2021 Feb 1;137(2):e16-e28. doi: 10.1097/AOG.0000000000004251. PMID: 33481528.

ACOG Committee Opinion No. 764: Medically Indicated Late-Preterm and Early-Term Deliveries. Obstet Gynecol. 2019 Feb;133(2):e151-e155. doi: 10.1097/AOG.0000000000003083. PMID: 30681545.

ACOG Obstetric Care Consensus No. 10: Management of Stillbirth. *Obstet Gynecol* 2020 Mar;135(3):e110-e132.

Page et al. Term fetal/infant mortality risk stratified by maternal age. *Am J Obstet Gynecol* 2013.

https://manual.jointcommission.org/releases/TJC2017A/AppendixATJC.html#Table_Number_11.07:_Conditions_Possibly_Justifying_Elective_Delivery_Prior_to_39_Weeks_Gestation

Table 1. Recommendations for the Timing of Delivery When Conditions Complicate Pregnancy*

Condition	General Timing	Suggested Specific Timing
Placental/Uterine Conditions		
Placenta previa†	Late preterm/early term	36 0/7–37 6/7 weeks of gestation
Suspected accreta, increta, or percreta†	Late preterm	34 0/7–35 6/7 weeks of gestation
Vasa previa	Late preterm/early term	34 0/7–37 0/7 weeks of gestation
Prior classical cesarean	Late preterm/early term	36 0/7–37 0/7 weeks of gestation
Prior myomectomy requiring cesarean delivery‡	Early term (individualize)	37 0/7–38 6/7 weeks of gestation
Previous uterine rupture	Late preterm/early term	36 0/7–37 0/7 weeks gestation
Fetal Conditions		
Oligohydramnios (isolated or otherwise uncomplicated [deepest vertical pocket less than 2 cm])	Late preterm/early term	36 0/7–37 6/7 weeks of gestation or at diagnosis if diagnosed later
Polyhydramnios†	Full term	39 0/7–39 6/7 weeks of gestation
Growth restriction (singleton)		
Otherwise uncomplicated, no concurrent findings	Early term/full term	38 0/7–39 6/7 weeks of gestation
Abnormal umbilical artery dopplers: elevated S/D ratio with diastolic flow	Early term	Consider at 37 0/7 weeks of gestation or at diagnosis if diagnosed later
Abnormal umbilical artery dopplers: absent end diastolic flow	Late preterm	Consider at 34 0/7 weeks of gestation or at diagnosis if diagnosed later
Abnormal umbilical artery dopplers: reversed end diastolic flow	Preterm	Consider at 32 0/7 weeks of gestation or at diagnosis if diagnosed later
Concurrent conditions (oligohydramnios, maternal co-morbidity [eg, preeclampsia, chronic hypertension])	Late preterm/early term	34 0/7–37 6/7 weeks of gestation
Multiple gestations—uncomplicated		
Dichorionic-diamniotic twins	Early term	38 0/7–38 6/7 weeks of gestation
Monochorionic-diamniotic twins	Late preterm/early term	34 0/7–37 6/7 weeks of gestation
Monochorionic-monoamniotic twins	Preterm/late preterm	32 0/7–34 0/7 weeks of gestation
Triplet and higher order	Preterm/late preterm	Individualized
Multiple gestations—complicated		
Dichorionic-diamniotic twins with isolated fetal growth restriction	Late preterm/early term	36 0/7–37 6/7 weeks of gestation
Dichorionic-diamniotic twins with concurrent condition	Late preterm	Individualized
Monochorionic-diamniotic twins with isolated fetal growth restriction	Preterm/late preterm	32 0/7–34 6/7 weeks of gestation
Alloimmunization		
At-risk pregnancy not requiring intrauterine transfusion	Early term	37 0/7–38 6/7 weeks of gestation
Requiring intrauterine transfusion	Late preterm or early term	Individualized
Maternal Conditions		
Hypertensive disorders of pregnancy		
Chronic hypertension: isolated, uncomplicated, controlled, not requiring medications	Early term/full term	38 0/7–39 6/7 weeks of gestation§
Chronic hypertension: isolated, uncomplicated, controlled on medications	Early term/full term	37 0/7–39 6/7 weeks of gestation§
Chronic hypertension: difficult to control (requiring frequent medication adjustments)	Late preterm/early term	36 0/7–37 6/7 weeks of gestation
Gestational hypertension, without severe-range blood pressure	Early term	37 0/7 weeks or at diagnosis if diagnosed later

(*continued*)

Table 1. Recommendations for the Timing of Delivery When Conditions Complicate Pregnancy* (*continued*)

Condition	General Timing	Suggested Specific Timing
Gestational hypertension with severe-range blood pressures	Late preterm	34 0/7 weeks of gestation or at diagnosis if diagnosed later
Preeclampsia without severe features	Early term	37 0/7 weeks of gestation or at diagnosis if diagnosed later
Preeclampsia with severe features, stable maternal and fetal conditions, after fetal viability (includes superimposed)	Late preterm	34 0/7 weeks of gestation or at diagnosis if diagnosed later
Preeclampsia with severe features, unstable or complicated, after fetal viability (includes superimposed and HELLP)	Soon after maternal stabilization	Soon after maternal stabilization
Preeclampsia with severe features, before viability	Soon after maternal stabilization‖	Soon after maternal stabilization‖
Diabetes		
Pregestational diabetes well-controlled†	Full term	39 0/7–39 6/7 weeks of gestation
Pregestational diabetes with vascular complications, poor glucose control, or prior stillbirth	Late preterm/early term	36 0/7–38 6/7 weeks of gestation
Gestational: well controlled on diet and exercise	Full term	39 0/7–40 6/7 weeks of gestation
Gestational: well controlled on medications	Full term	39 0/7–39 6/7 weeks of gestation
Gestational: poorly controlled	Late preterm/early term	Individualized
HIV		
Intact membranes and viral load >1,000 copies/mL	Early-term cesarean delivery	38 0/7 weeks of gestation
Viral load ≤1,000 copies/ml with antiretroviral therapy	Full term (early term birth not indicated)	39 0/7 weeks of gestation or later
Intrahepatic cholestasis of pregnancy	Late preterm/early term	36 0/7–37 0/7 weeks of gestation or at diagnosis if diagnosed later¶
Obstetric Conditions		
Preterm PROM	Late preterm	34 0/7 weeks of gestation or at diagnosis if diagnosed later
PROM (37 0/7 weeks of gestation and beyond)	Generally, at diagnosis	Generally, at diagnosis
Previous stillbirth	Full term (early term birth not routinely recommended)	Individualized

Abbreviations: HELLP, hemolysis, elevated liver enzymes, and low platelet count; PROM, prelabor rupture of membranes (also referred to as premature rupture of membranes).

*In situations in which there is a wide gestational age range for acceptable delivery thresholds, the lower range is not automatically preferable, and medical decision making for the upper or lower part of a range should depend on individual patient factors and risks and benefits.

†Uncomplicated, thus no fetal growth restriction, superimposed preeclampsia, or other complication. If these conditions are present, then the complicating conditions take precedence and earlier delivery may be indicated.

‡Prior myomectomy may require earlier delivery similar to prior classical cesarean (36 0/7–37 0/7 weeks of gestation) in situations with more extensive or complicated myomectomy. Data are conflicting regarding specific timing of delivery. Furthermore, timing of delivery may be influenced by the degree and location of the prior uterine surgery, with the possibility of delivering as late as 38 6/7 weeks of gestation for a patient with a less extensive prior surgery. Timing of delivery should be individualized based on prior surgical details (if available) and the clinical situation.

§Expectant management beyond 39 0/7 weeks of gestation should only be done after careful consideration of the risks and benefits and with appropriate surveillance.

‖Management individualized to particulars of maternal–fetal condition and gestational age.

¶Delivery before 36 weeks of gestation occasionally may be indicated depending on laboratory and clinical circumstances.

ACOG Committee Opinion No. 764: Medically Indicated Late-Preterm and Early-Term Deliveries. Obstet Gynecol. 2019 Feb;133(2):e151-e155. doi: 10.1097/AOG.0000000000003083. PMID: 30681545.

Appendix II: Risk of Stillbirth Induction of Labor Counseling Tool:

Table 1. Estimated Rate of Stillbirth With Maternal or Fetal Conditions

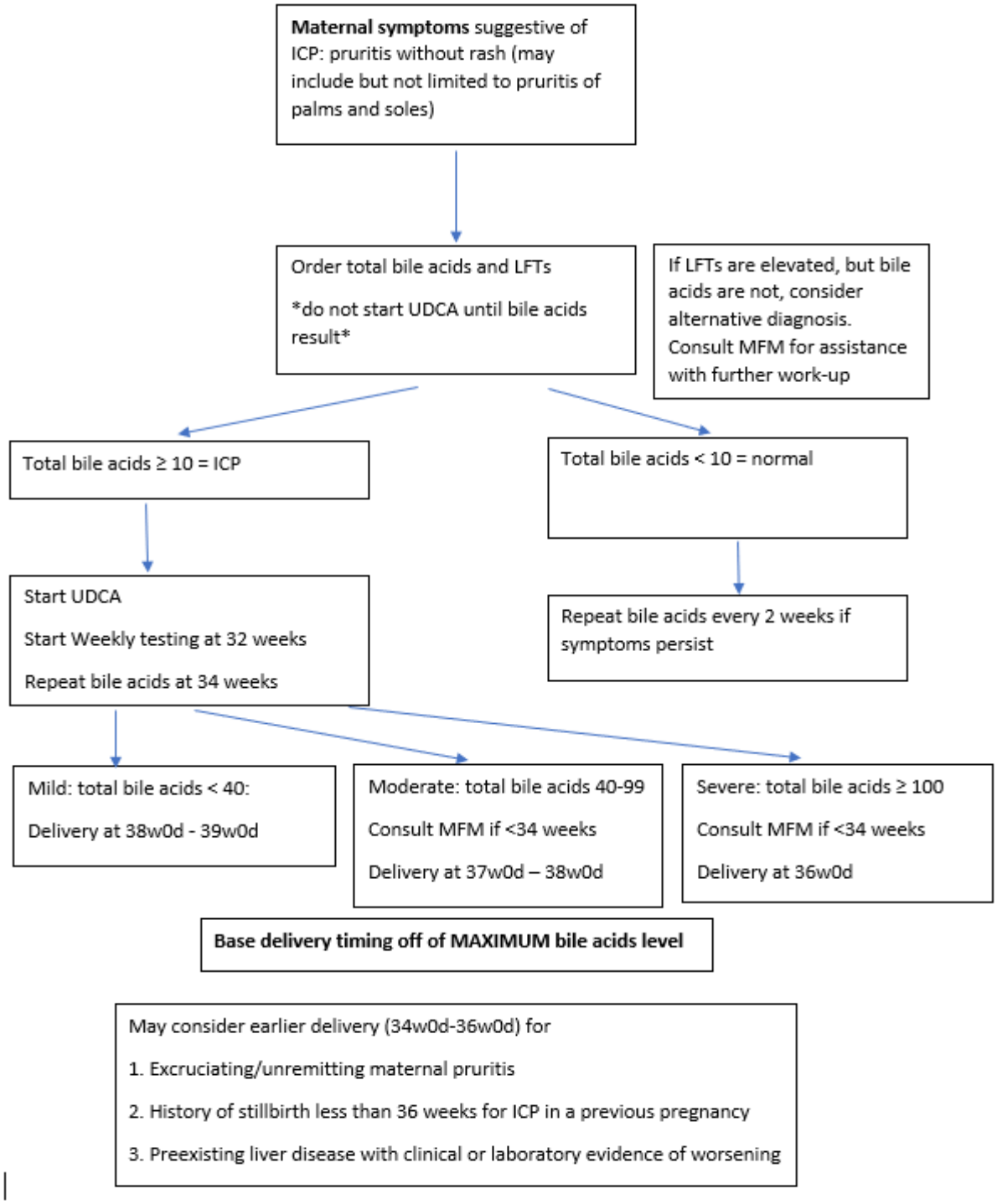
Condition	Estimated Rate of Stillbirth*
All pregnancies	6.4/1000
Diabetes	
Treated with diet (A1)	6–10/1000
Treated with insulin	6–35/1000
Hypertensive disorder	
Chronic hypertension	6–25/1000
Preeclampsia	
without severe features	9–51/1000
with severe features	12–29/1000
Growth restricted fetus	10–47/1000
Multiple gestation	
Twins	12/1000
Triplets	34/1000
Oligohydramnios	14/1000
Late term pregnancy (greater than 41 weeks)	14–40/1000[†]
Previous stillbirth	9–20/1000
Decreased fetal movement	13/1000
Systemic lupus erythematosus	40–150/1000
Renal disease	15–200/1000
Cholestasis of pregnancy	12–30/1000
Advanced maternal age	
35–39 years	11–14/1000
40 years or greater	11–21/1000
Black maternal race	12–14/1000
Maternal age less than 20 years	7–13/1000
Assisted reproductive technology	12/1000
Obesity (prepregnancy)	
BMI equal to or greater than 30 kg/m^2	13–18/1000
Smoking greater than 10 cigarettes per day	10–15/1000

*Rate per 1,000 live births and stillbirths

[†]Data from Rosenstein MG, Snowden JM, Cheng YW, Caughey AB. The mortality risk of expectant management compared with delivery stratified by gestational age and race and ethnicity. Am J Obstet Gynecol 2014;211:660.e1–8.

ACOG Obstetric Care Consensus No. 10: Management of Stillbirth. *Obstet Gynecol* 2020 Mar;135(3):e110-e132.

APPENDIX III: Delivery Timing and Logistical Practice for BMC and CHC providers

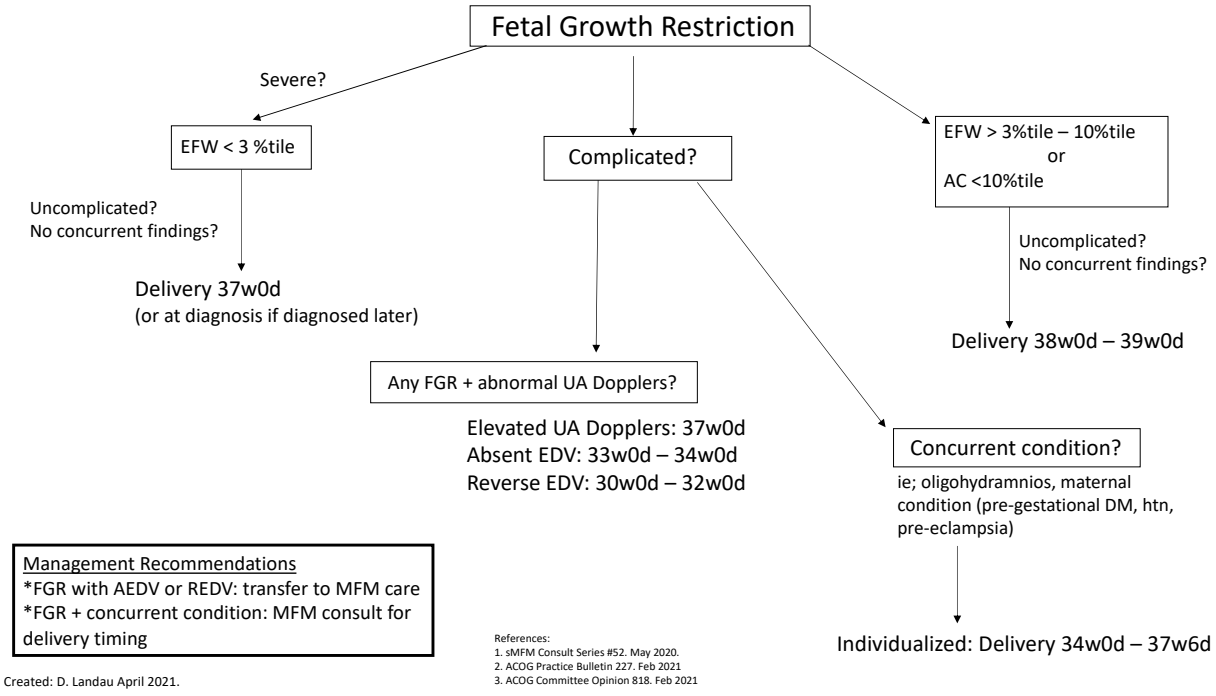


Algorithm adapted from University of North Carolina Dept. of Ob/Gyn with permission.

Note – if there are clinician concerns regarding inconsistent clinical picture, please consult MFM for management and delivery plan.

References

Appendix III: Fetal Growth Restriction Algorithm



References:
1. sMFM Consult Series #52. May 2020.
2. ACOG Practice Bulletin 227. Feb 2021
3. ACOG Committee Opinion 818. Feb 2021

Appendix IV: Postterm pregnancy by maternal age, gestational age, and parity

Risk of stillbirth and infant death stratified by maternal age 35 years and gestational age

	Stillbirth per 10,000 ongoing pregnancies (95% CI)		Infant death per 10,000 live births (95% CI)	
GA, wks	Maternal age <35 y	Maternal age ≥35 y	Maternal age <35 y	Maternal age ≥35 y
37	2.2 (1.6–2.8)	3.3 (1.4–5.1)	37.1 (34.6–39.6)	23.9 (18.9–29.0)
38	3.0 (2.6–3.5)	4.0 (2.7–5.3)	25.4 (24.0–26.7)	15.9 (13.3–18.4)
39	3.9 (3.5–4.3)	5.0 (3.8–6.2)	18.8 (17.8–19.7)	10.9 (9.2–12.7)
40	6.8 (6.2–7.4)	10.0 (8.0–12.0)	17.4 (16.4–18.4)	10.3 (8.2–12.3)
41	8.5 (7.3–9.8)	15.4 (10.7–20.2)	15.6 (13.9–17.3)	11.9 (7.7–16.0)
42	28.2 (20.4–36.0)	32.5 (10.0–54.9)	22.6 (15.6–29.5)	24.4 (4.9–43.9)

Stillbirth was an intrauterine fetal demise occurring at or after 20 weeks' gestation. Infant death was a death occurring within the first year of life.
CI, confidence interval.
Page. Term fetal/infant mortality risk stratified by maternal age. Am J Obstet Gynecol 2013

Does it make a difference if I've had a baby before?

Risk of stillbirth is lower if you have already had a baby before, regardless of your age.

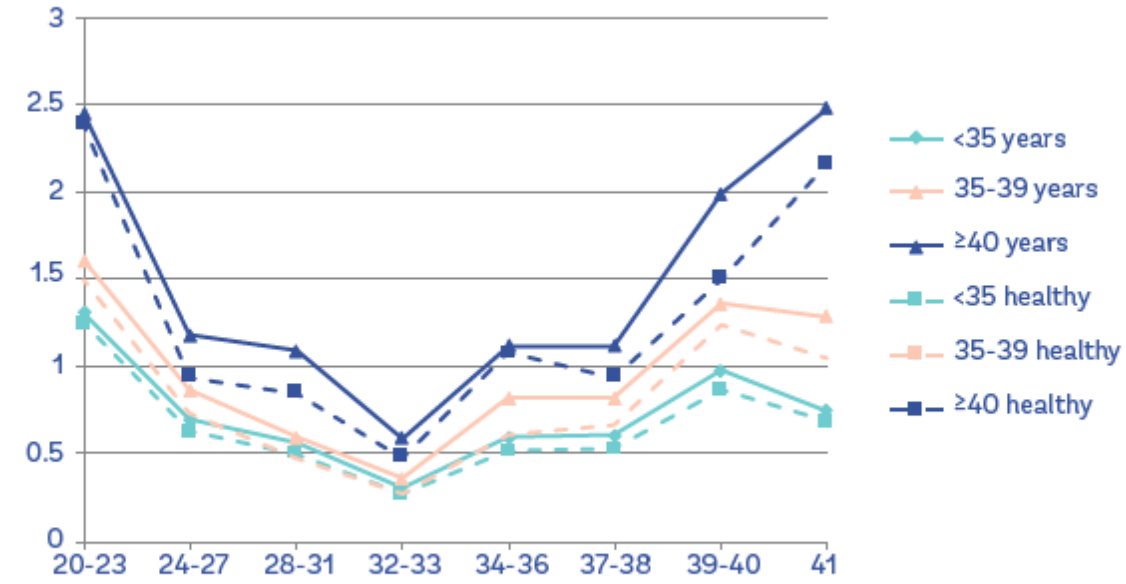
*These numbers are different than the risks of stillbirth quoted earlier for people at 39-40 weeks (i.e., 2/1000 for clients 40 and over and 1/1000 for people under 35). That's because the numbers to the right represent the risk of stillbirth at any point between 37 and 41 weeks of pregnancy.

	Risk of stillbirth* at any point between 37 and 41 weeks of pregnancy	
During a first pregnancy	Age: Under 35 years	About 4 in 1000
	Age: 35 to 39 years	About 6.5 in 1000
	Age: 40 years and older	About 9 in 1000
During a second, third, fourth (or later) pregnancy	Age: Under 35 years	About 1 in 1000
	Age: 35 to 39 years	About 2 in 1000
	Age: 40 years and older	About 3 in 1000

In Due Time…Pregnancy beyond 40 and Induction of Labour. Ontario Midwives Association. 2017. https://www.ontariomidwives.ca/sites/default/files/2017-10/In-due-time-pregnancy-beyond-40-English.pdf

Rates of Stillbirth by Gestational Age and Maternal Age for general population versus "healthy women" defined as no DM, HTN, preeclampsia, heart/kideney/lung disease. https://evidencebasedbirth.com/advanced-maternal-age/

Figure 4: Overall sample vs. healthy women only (dashed lines)



*Data from Reddy et al. (2006). AJOG 195, 764-70.