

**DR.TAYEBE NOORI**  
**OBSTETRIAN&GYNECOLOGIST**  
**ASSISTANT PROFESSOR**  
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**Management of the Near-Term FGR  
&Delivery**

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**Delivery be deferred until 38 weeks' gestation.**

- **1) normal umbilical artery Dopplervelocimetry,**
  - **2) normal amnionic fluid volume,**
  - **3)reassuring fetal heart rate testing**
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- ❖ recommend delivery at **34 weeks or beyond** if there is clinically significant **oligohydramnios**.
- ❖ Maternal-Fetal Medicine (Spong, 2011) and the American College of Obstetricians and Gynecologists (2017a): These recommend delivery **between 34 and 37 weeks** when there are comorbid conditions such as oligohydramnios.
- ❖ With a reassuring fetal heart rate pattern, **vaginal delivery** is planned. Notably, some of these fetuses do not tolerate labor.

≥ 34 weeks but < 38 weeks

- Evaluate maternal status and comorbidities
- Umbilical artery Doppler velocimetry
- Fetal testing—NST, BPP, etc.

- Consider delivery if:
- Absent or reversed end-diastolic flow
  - Oligohydramnios
  - Nonreassuring fetal tracing
  - Maternal status or obstetrical indications necessitate delivery

- If no indications for immediate delivery:
- Antepartum fetal surveillance—BPP, NST, etc.
  - Umbilical artery Doppler velocimetry weekly
  - Amnionic fluid evaluation weekly

Repeat sonography for fetal growth every 3–4 weeks

Fetal growth—continue fetal surveillance until 38 weeks, then deliver

None or poor growth—consider delivery

- × We use a combination of the **NST and BPP** to monitor FGR as these tests evaluate both acute and chronic fetal physiologic parameters.
- × The tests are relatively **easy to perform**, and **fetal death** within one week of a normal test score is **rare** .
- × If the NST is performed without a BPP, amniotic fluid volume assessment should also be performed weekly.
- × Chronic placental insufficiency results in both FGR and oligohydramnios, pregnancies complicated by FGR and oligohydramnios have a modestly increased risk of perinatal mortality
- × . Conversely, **normal amniotic fluid** volume is infrequently associated with either FGR or fetal demise, unless the cause is a congenital malformation or aneuploidy.



# • LABOR AND DELIVERY

- ✗ Fetal-growth restriction is commonly the result of placental insufficiency due to faulty maternal perfusion, reduction of functional placenta, or both.
- ✗ If present, these conditions are likely aggravated by labor.
- ✗ Equally important, **diminished amniotic fluid** volume raises the likelihood of **cord compression** during labor. For these and other reasons, the frequency of cesarean delivery is increased.
- ✗ a woman with a suspected growth-restricted fetus should undergo "high-risk" intrapartum monitoring

- × The risk of **neonatal hypoxia** or **meconium aspiration** is also greater.
- × severely growth-restricted newborn is particularly susceptible to **hypothermia** and may also develop other metabolic derangements such as **hypoglycemia**, **polycythemia**, and **hyperviscosity**. In addition, low-birthweight newborns are at higher risk for motor and other **neurological disabilities**.

# OUR APPROACH(TIMING DELIVERY )

- × time the delivery of the growth-restricted fetus based on a **combination of factors**, including gestational age, Doppler ultrasound of the umbilical artery, BPP score, ductus venosus Doppler, and the presence or absence of risk factors , or signs of, uteroplacental insufficiency.
- × The goal is to **maximize** fetal maturity and growth while **minimizing** the risks of fetal or neonatal mortality and short-term and long-term morbidity. The greatest challenge related to timing of delivery is in the preterm fetus <32 weeks of gestation. Morbidity and mortality related to preterm delivery is relatively high before 32 weeks



- ✖ Umbilical artery **decreased diastolic flow** (persistent pulsatility index >95th percentile) – This is a **weak predictor** of fetal death.
- ✖ We perform a **BPP two times per week** and deliver these fetuses at 37 weeks or when the BPP becomes **abnormal**.
- ✖ Delivery at 34 to 37 weeks is reasonable if **umbilical artery flow** is **decreased** and risk factors for, or signs of, uteroplacental insufficiency are present, such as oligohydramnios, preeclampsia or hypertension, renal insufficiency, fetal growth arrest, estimated weight <5th percentile, or prior birth of a small for gestational age infant.
- ✖ ● Normal umbilical artery Doppler – This provides strong evidence of fetal well-being, especially in the absence of risk factors for, or signs of, uteroplacental insufficiency. We deliver these fetuses at 39 to 40 weeks of gestation

# INTRAPARTUM MANAGEMENT

- × – Growth-restricted fetuses may exist in a state of mild-to-moderate chronic oxygen and substrate deprivation.
- × **Potential consequences** include antepartum or intrapartum fetal heart rate abnormalities, passage of meconium with risk of aspiration, and neonatal polycythemia, impaired thermoregulation, hypoglycemia, and other metabolic abnormalities .

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- × , it is important to optimize the timing of delivery , perform continuous intrapartum fetal monitoring to **detect nonreassuring** fetal heart rate patterns suggestive of **progressive hypoxia** during labor, and provide **skilled neonatal care** in the delivery room .
  - × Umbilical cord blood analysis (**ABG**) should be considered as a component of establishing baseline neonatal status. **Cesarean** delivery for fetal indications is more **common** when growth restriction is present

مرحله	پاتوفیزیولوژی	معیار (هر کدام از)	ارزیابی (حداقل فاصله زمانی)	زمان ختم بارداری	نوع زایمان
I IUGR	کوچکی شدید و یا نارسایی خفیف جفت	EFW<3rd centile CPR<P5 UA PI>P95 MCA PI<P5 UtA PI>P95	- سونوگرافی بیومتری هر دو هفته یکبار - داپلر هر هفته یکبار - بیوفیزیکال پروفایل دوبار در هفته	۲۷ هفته	القای زایمان
II IUGR	نارسایی شدید جفت	UA AEDV Reverse AoI	- داپلر و بیوفیزیکال پروفایل دو بار در هفته - NST روزانه	۲۴ هفته	سزارین، در صورت زایمان واژینال، مانیتور دائم در تمام مراحل
III IUGR	زوال پیشرفته جنین، احتمال کم اسیدوز جنین	UA REDV DV PI>p95	- داپلر، بیوفیزیکال پروفایل و cCTG حداقل هر ۲۴-۴۸ ساعت	۲۲ هفته	سزارین
IV IUGR	احتمال بالای اسیدوز جنین و خطر بالای مرگ جنین	DV reverse a flow cCTG<3ms FHR decelerations	مانیتورینگ مستمر ضربان قلب جنین	۲۶ هفته	سزارین

EFW: Estimated Fetal Weight  
CPR: Cerebroplacental Ratio  
UA: Umbilical Artery  
PI: Pulsatility Index  
MCA: Middle Cerebral Artery

ADF: Absent Diastolic Flow  
AEDF: Absent End Diastolic Flow  
DV: Dactus Venosus  
UtA: Uterine Artery  
AoI: Aortic isthmus Index