FETAL GROWTH DISORDERS

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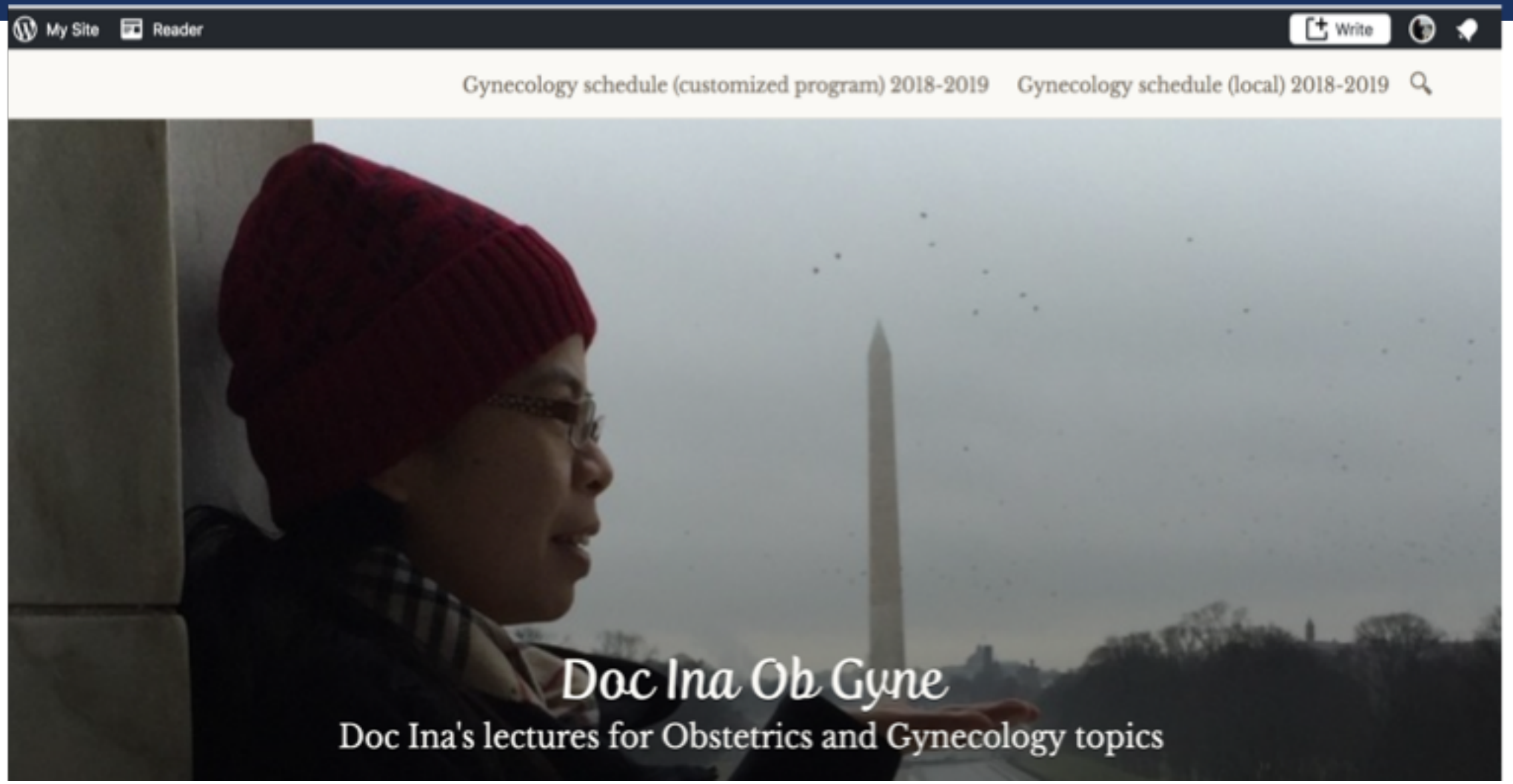


REFERENCE

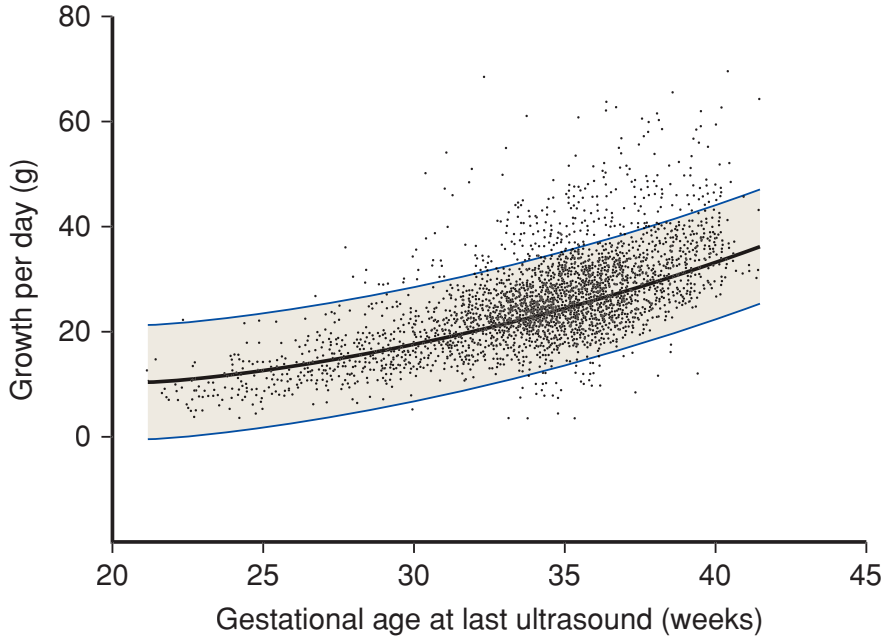
Cunningham FG, Leveno KJ, Bloom SL, Spong CY, Dashe JS, Hoffman BL, Casey BM, Sheffield JS (eds). William's Obstetrics 25th edition; 2014; chapter 44 Fetal Growth Disorders

OUTLINE

- Fetal growth
- Fetal growth restriction
- Fetal overgrowth

FETAL GROWTH

- Fetal growth has been divided into **three phases.**
  - first phase of hyperplasia occurs in the first 16 weeks and is characterized by a rapid increase in cell number; fetal growth rate is 5 g/day at 15 weeks' gestation
  - second phase extends up to 32 weeks' gestation, and includes both cellular hyperplasia and hypertrophy; fetal growth rate is 15 to 20 g/day at 24 weeks
  - Third phase occurs after 32 weeks, whereby fetal growth is by cellular hypertrophy → most fetal fat and glycogen are accumulated; fetal-growth rate is 30 to 35 g/day at 34 weeks



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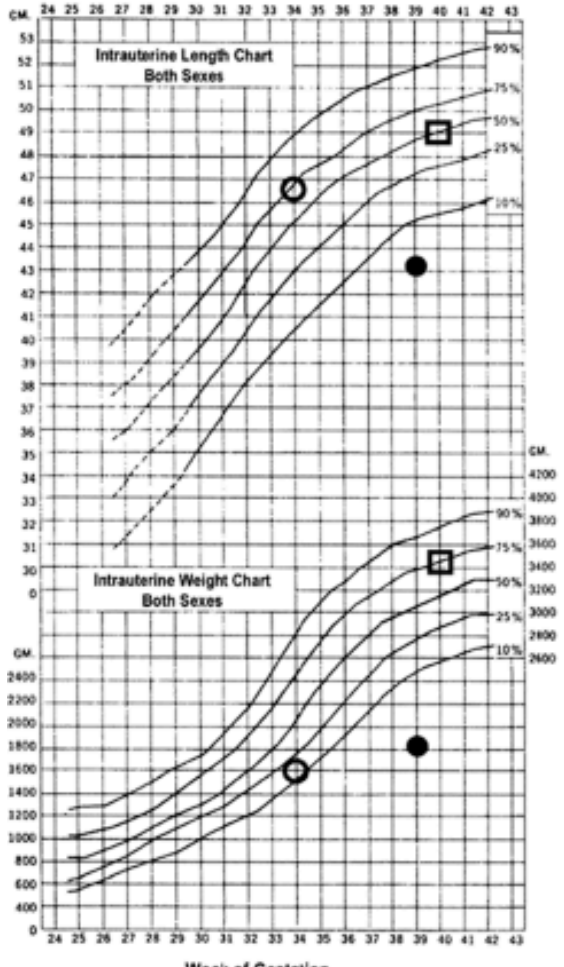
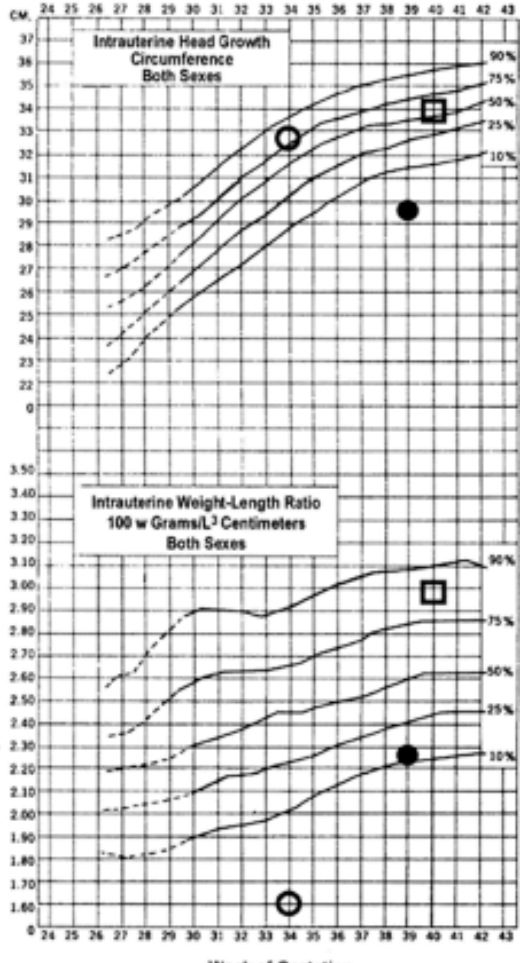
FETAL GROWTH

Colorado Intrauterine Growth Charts





FETAL GROWTH RESTRICTION

- Low birthweight newborns that are small for gestational age
- (SGA) neonates as those whose weights were below the 10th percentile for their gestational age
- Increased risk for neonatal death
- Symmetrical versus asymmetrical growth restriction

TABLE 44-1. Smoothed Percentiles of Birthweight (g) for Gestational Age in the United States Based on 3,134,879 Singleton Live Births

	Percentile				
Age (wk)	5th	10th	50th	90th	95th
20	249	275	412	772	912
21	280	314	433	790	957
22	330	376	496	826	1023
23	385	440	582	882	1107
24	435	498	674	977	1223
25	480	558	779	1138	1397
26	529	625	899	1362	1640
27	591	702	1035	1635	1927
28	670	798	1196	1977	2237
29	772	925	1394	2361	2553
30	910	1085	1637	2710	2847
31	1088	1278	1918	2986	3108
32	1294	1495	2203	3200	3338
33	1513	1725	2458	3378	3536
34	1735	1950	2667	3502	3697
35	1950	2159	2831	3596	3812
36	2156	2354	2974	3668	3888
37	2357	2541	3117	3755	3956
38	2543	2714	3263	3867	4027
39	2685	2852	3400	3980	4107
40	2761	2929	3495	4060	4185
41	2777	2948	3527	4094	4217
42	2764	2935	3522	4098	4213
43	2741	2907	3505	4096	4178
44	2724	2885	3491	4096	4122

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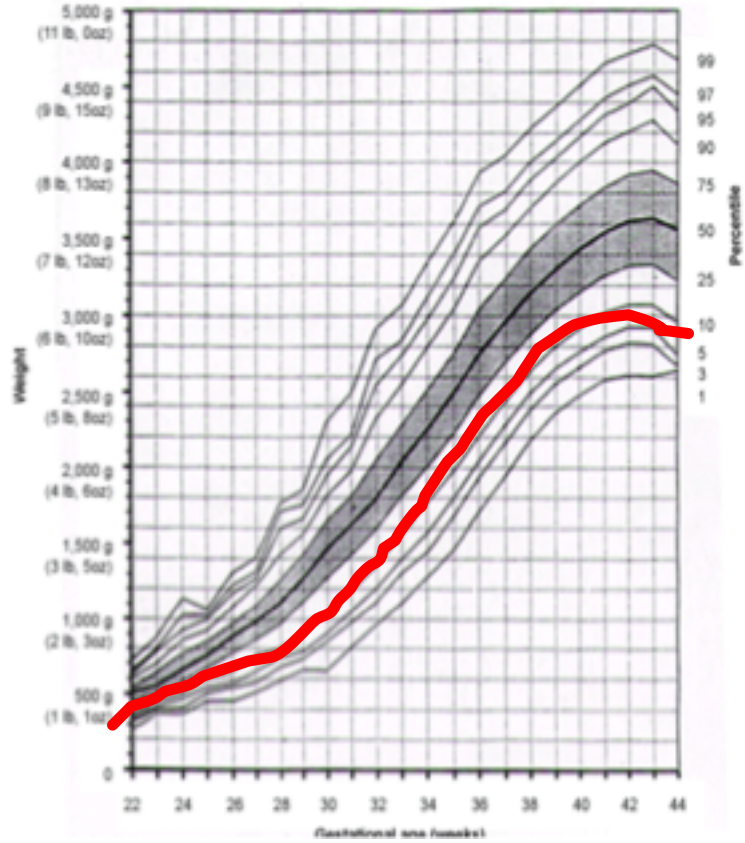

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SYMMETRIC VS ASYMMETRIC

- Symmetrical growth restriction implies a fetus whose entire body is proportionally small.
- Asymmetric growth restriction implies a fetus who is undernourished and is directing most of its energy to maintaining growth of vital organs, such as the brain and heart, at the expense of the liver, muscle and fat. → normal head dimension but a small abdominal circumference (lagging abdominal growth compared to head growth)
  - This type of growth restriction is usually the result of placental insufficiency.

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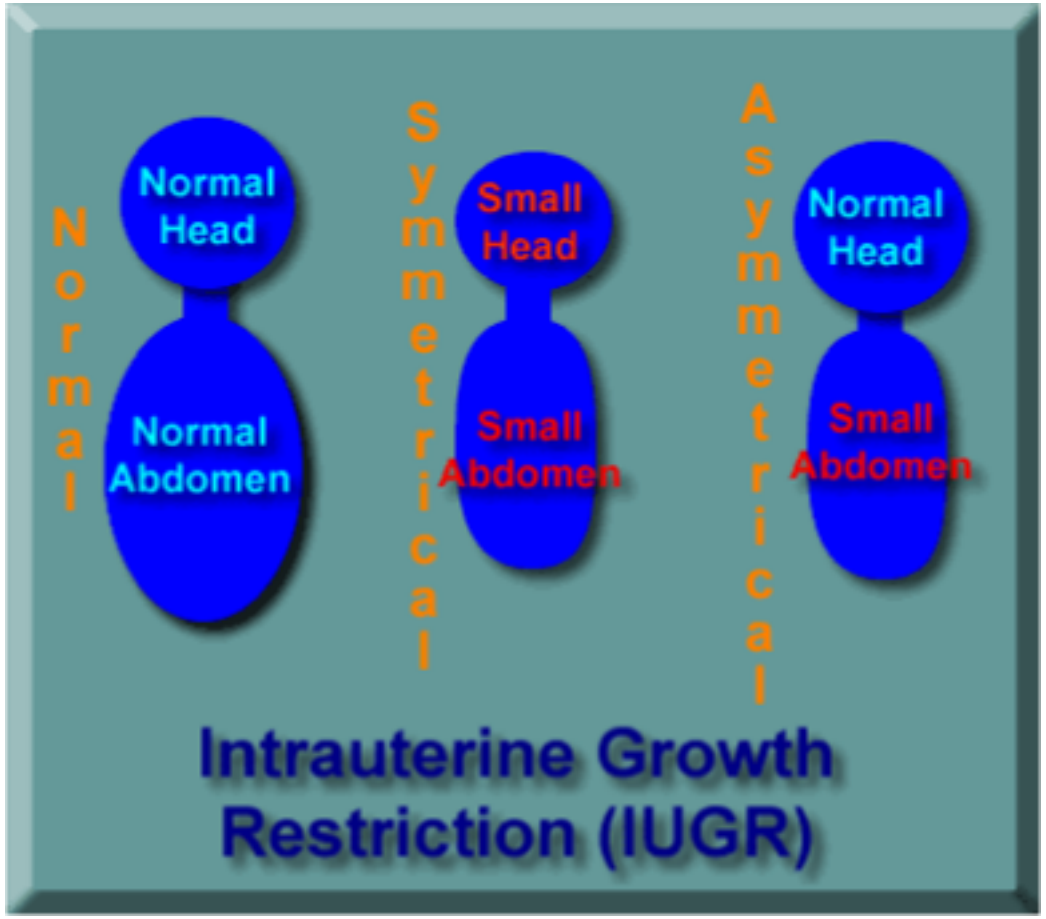
SYMMETRIC VS ASYMMETRIC



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"BRAIN SPARING"

- Results from preferential shunting of oxygen and nutrients to the brain → allows for normal brain and head growth
- Because of brain-sparing effects, asymmetrical fetuses are "protected" from the full effects of growth restriction.
- These fetuses are at greater risk for intrapartum and neonatal complications

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SYMMETRIC VS ASYMMETRIC

Symmetric

- Happens Early in utero
- Etiology: comgenital infections, genetic disorders
- Pathophysiology: impaired cell division, decreased cell number → irreversible
- Clinical features: inadequate growth of head and body; head:abdomen ratio is normal
- Prognosis: Poor

Assymmetric

- Later onset
- Etiology: uteroplacental insufficiency, maternal nutrition, hypertension
- Pathophysiology: impaired cellular hypertrophy, decreased cell size → reversible
- Clinical features: brain is spared → head:abdomen ratio increased
- Prognosis: favorable prognosis

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CAUSES OF FETAL GROWTH RESTRICTION

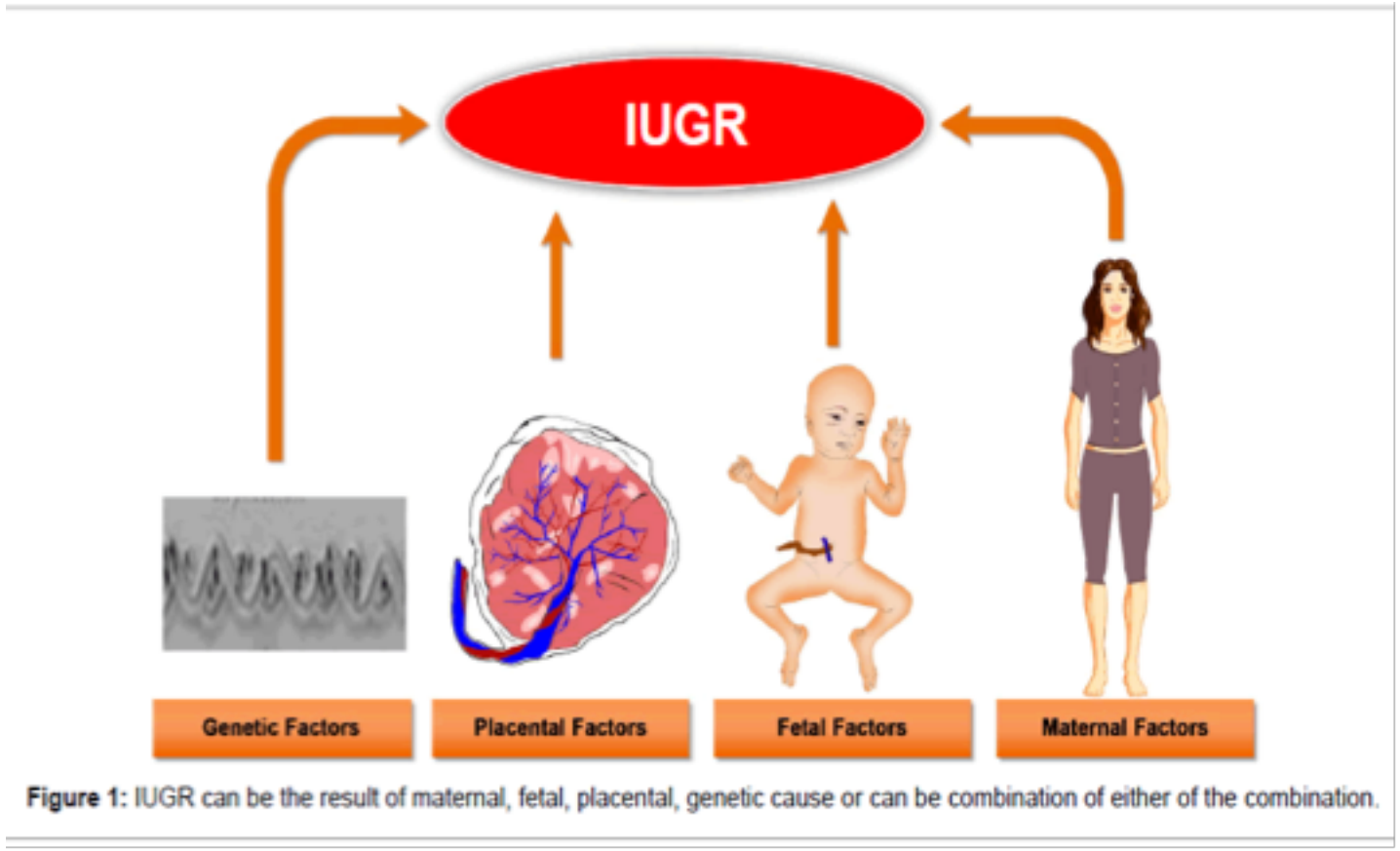

Figure 1: IUGR can be the result of maternal, fetal, placental, genetic cause or can be combination of either of the combination.

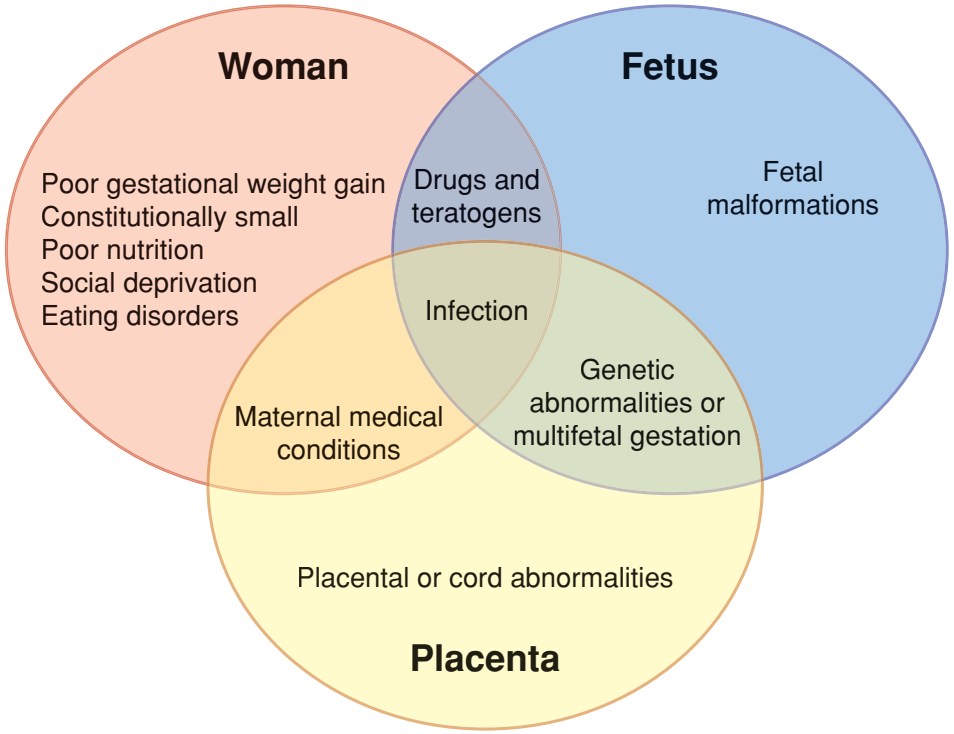

FIGURE 44-4 Risk factors and causes of impaired fetal growth centering on the mother, her fetus, and the placenta.

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CAUSES OF FETAL GROWTH RESTRICTION

- Approximately 70 percent of fetuses with a birth weight below the 10th percentile for gestational age are constitutionally small[8]; in the remaining 30 percent, the cause of IUGR is pathologic.

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DIAGNOSIS OF FETAL GROWTH RESTRICTION

- **definitive diagnosis** frequently cannot be made until delivery.
- Early establishment of gestational age, ascertainment of maternal weight gain, and careful measurement of uterine fundal growth throughout pregnancy will identify many cases of abnormal fetal growth in low-risk women.

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DIAGNOSIS OF FETAL GROWTH RESTRICTION

- Uterine fundic height
- Sonographic measurement of fetal size
- Amniotic fluid volume assessment
- Doppler velocimetry - early changes in placenta-based growth restriction are detected in peripheral vessels such as the umbilical and middle cerebral arteries.
  - Late changes are characterized by abnormal flow in the ductus venosus and fetal aortic and pulmonary out flow tracts and by reversal of umbilical artery flow.
  - abnormal umbilical artery Doppler velocimetry findings—characterized by absent or reversed end-diastolic ow—have been uniquely linked with fetal-growth restriction

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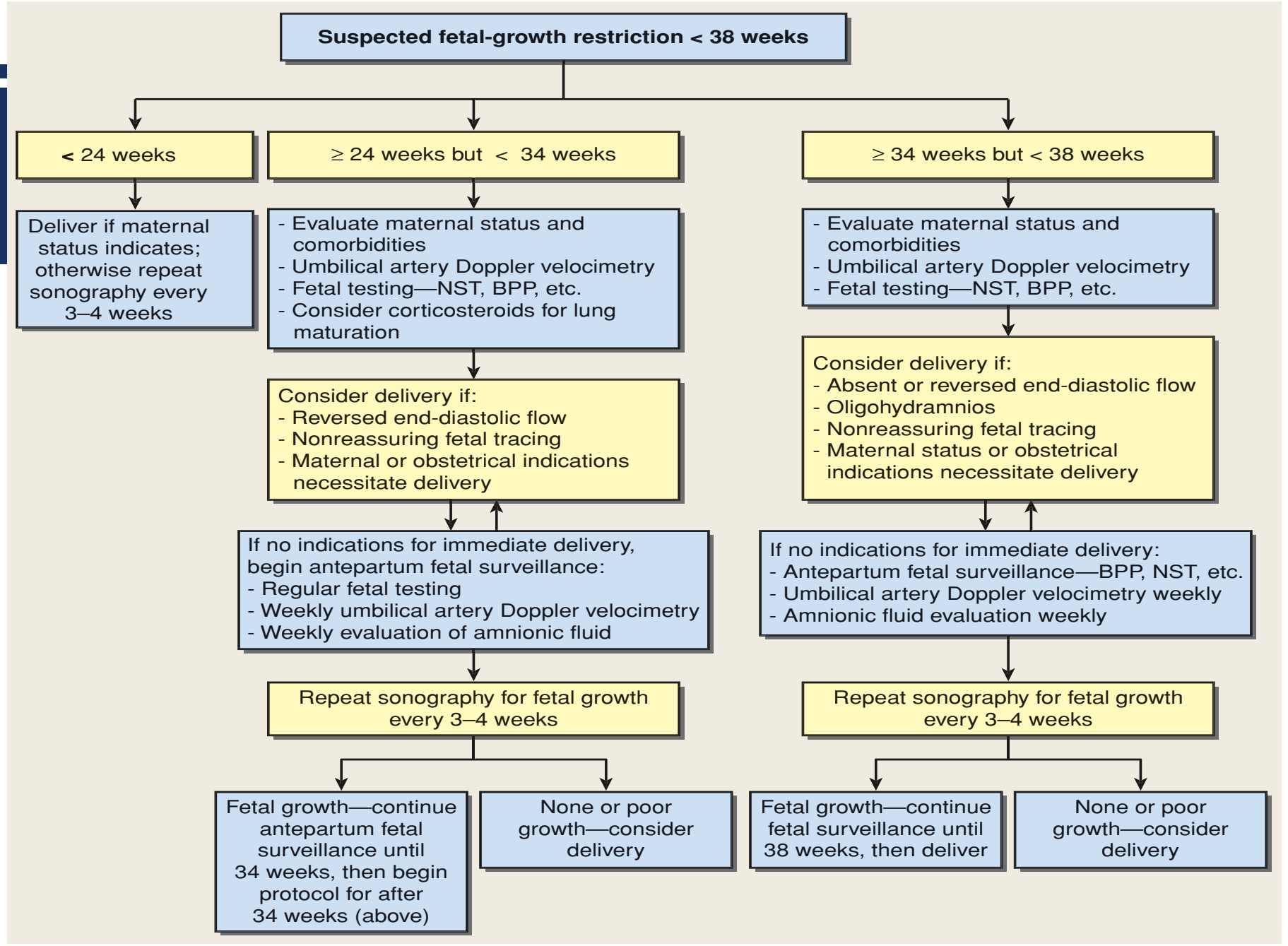
MANAGEMENT



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MANAGEMENT

- American College of Obstetricians and Gynecologists (2013a) recommends that pregnancies complicated by fetal-growth restriction and at risk for birth before 34 weeks receive antenatal corticosteroids for pulmonary maturation
- Antepartum fetal surveillance: periodic weekly doppler velocimetry (umbilical artery), sonographic assessment of fetal growth every 3-4 weeks, fetal heart rate tracings

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FETAL OVERGROWTH

- infants exceeding the 90th percentile for a given gestational week are usually used as the threshold for macrosomia or large-for-gestational age (LGA) birthweight.
- newborns who weigh 4500 g or more at birth.

TABLE 44-1. Smoothed Percentiles of Birthweight (g) for Gestational Age in the United States Based on 3,134,879 Singleton Live Births

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RISK FACTORS FOR FETAL OVERGROWTH

TABLE 44-3. Risk Factors for Fetal Overgrowth

Obesity
Diabetes—gestational and type 2
Postterm gestation
Multiparity
Large size of parents
Advancing maternal age
Previous macrosomic infant
Racial and ethnic factors

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DIAGNOSIS

- Identification of risk factors in the mother → high index of suspicion
- Uterine fundic height
- Sonographic measurement of fetal size

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MANAGEMENT

- Prophylactic labor induction
  - Some clinicians have proposed labor induction when fetal macrosomia is suspected in nondiabetic women to obviate further fetal growth and thereby reduce potential delivery complications. → should theoretically reduce the risk of shoulder dystocia and cesarean delivery.
  - current evidence does not support a policy for early labor induction before 39 weeks' gestation or delivery for suspected macrosomia. Moreover, delivery or induction for suspected macrosomia at term is likewise not indicated.
- Elective ceasarean delivery
  - the American College of Obstetricians and Gynecologists (2013b) does not recommend routine cesarean delivery in women without diabetes when the estimated fetal weight is < 5000 g.
  - in diabetic women with overgrown fetuses → CS is an option

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OUTLINE

- Fetal growth
- Fetal growth restriction
- Fetal overgrowth

Thank you!

youtube channel: Ina Irabon

www.wordpress.com: Doc Ina OB Gyne