

Intrauterine growth restriction

By

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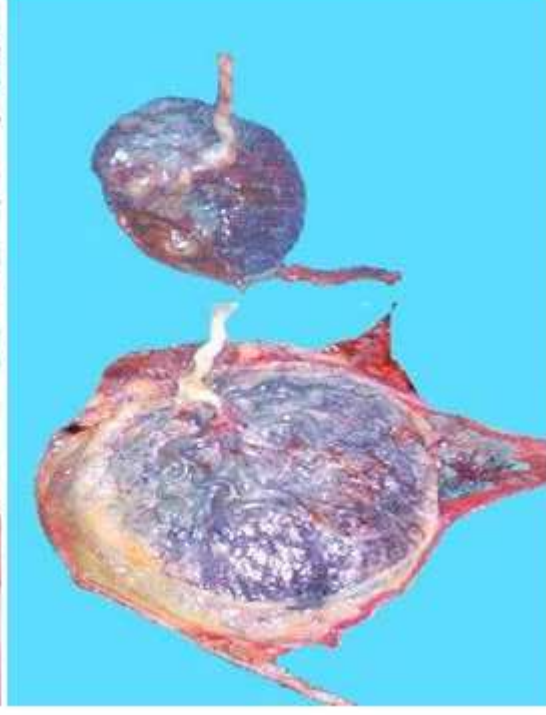
2018

Neonate and Placenta in IUGR

Normal & IUGR
Newborn babies



Normal & IUGR
Placentas



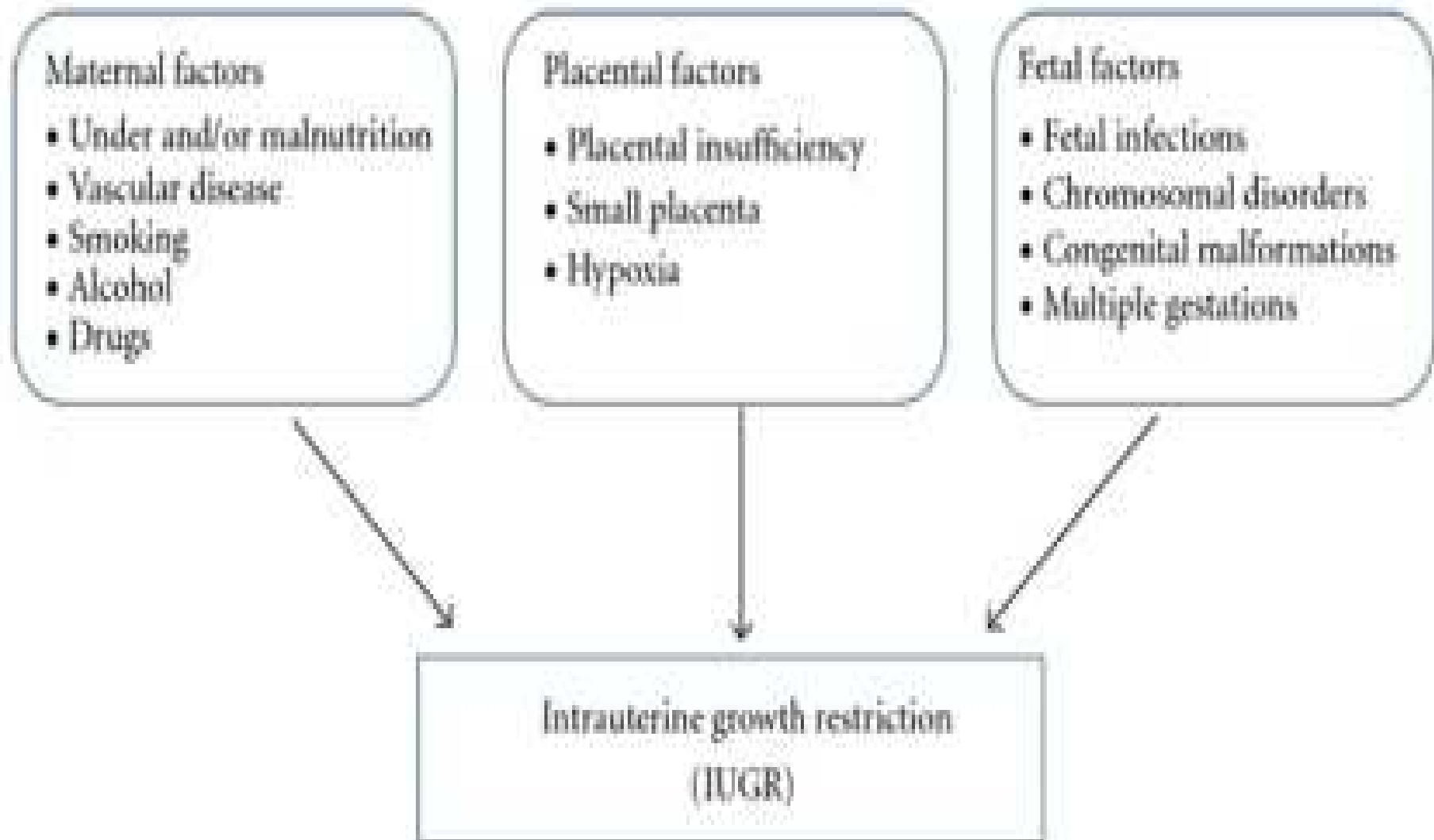
Definition of terms

- **IUGR**-defined as estimated fetal weight (EFW) at or below the 10th percentile for gestational age.
- fetus is unable to achieve its genetically determined potential size.
- NB: SGA and IUGR are related but not synonymous
- **SGA** is a term that applies to the infant that is less than the 10th percentile at birth or having a birth weight >2 standard deviations below the mean for gestational age.
- Not all fetuses that are SGA are pathologically growth restricted and, in fact, may be constitutionally small

SGA vs. IUGR

- ❑ SGA and IUGR are not synonymous
- ❑ SGA refers to the size of the infant at birth and not fetal growth
- ❑ IUGR suggests diminished intrauterine growth velocity
- ❑ IUGR indicates the presence of a pathologic process in-utero that inhibits fetal growth

Causes of IUGR



Classification of Intrauterine Growth Restriction

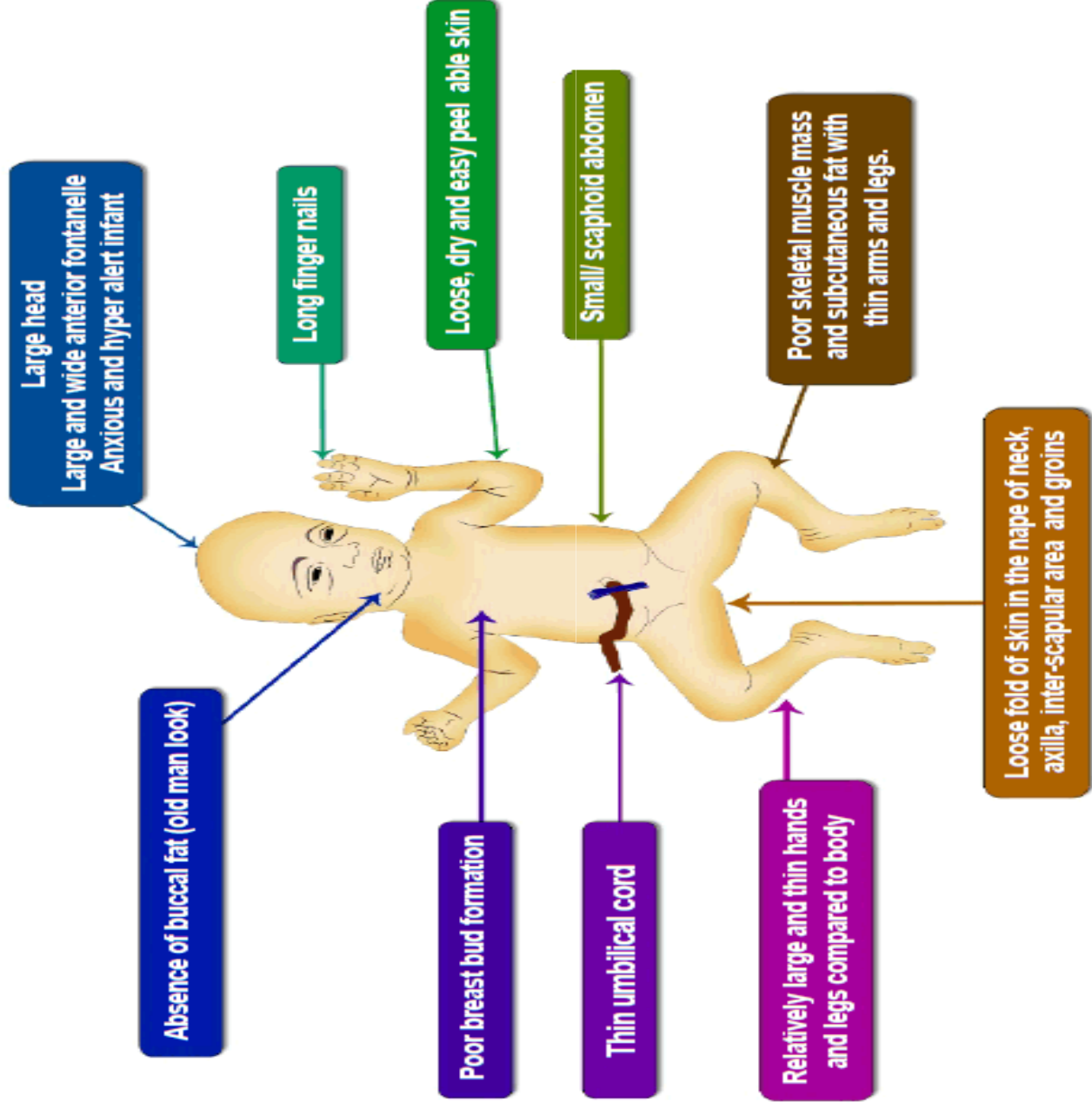
1. Symmetrical IUGR

2. Asymmetrical IUGR



Classification of IUGR

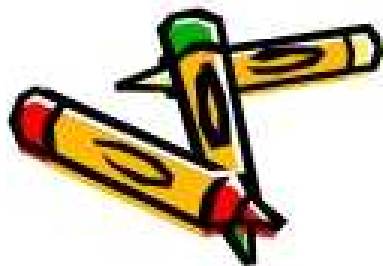
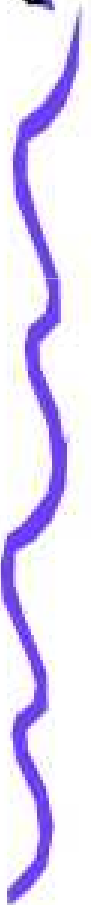
TYPE	SYMMETRIC/TYPE 1 (20%)	ASYMMETRIC/TYPE 2 (80%)
ONSET	Early in utero	Later onset
ETIOLOGY	Congenital infections, genetic disorders	Utero-placental insufficiency, maternal malnutrition, hypertension
PATHOPHYSIOLOGY	<ul style="list-style-type: none"> • Impaired cell division • Decreased cell number • irreversible 	<ul style="list-style-type: none"> • Impaired cellular hypertrophy • Decreased cell size • reversible
CLINICAL FEATURES	<ul style="list-style-type: none"> • inadequate growth of head and body • head:abdomen ratio may be normal 	<ul style="list-style-type: none"> • brain is spared, therefore head:abdomen ratio increased
PROGNOSIS	Poor prognosis	More favorable prognosis



: Clinical features of infants at birth that are having intrauterine growth restriction.

DIAGNOSIS OF IUGR

1. **HISTORY** :
 - 1. previous history of IUGR
 - 2. medical history
 - 3. drugs and drug abuse
 - 4. malnutrition
 - 5. PRESENT FACTORS DURING PREGNANCY;
(APH,early pregnancy bleeding,maternal preeclampsia)
- **EXAMINATION** : clinical palpation and
 - Serial measurements of SFH,
 - Maternal weight gain,AC



2. Sonographic evaluation-

- ✓ most useful tool for diagnosis of IUGR
- ✓ To differentiate between symmetrical and asymmetrical IUGR
- ✓ To monitor the fetal condition.

Fetal biometry:

- BPD(Biparietal Diameter)- determines gestational age and type of IUGR.

When growth rate of BPD is below 5th percentile, 82% of births are below 10th percentile(i.e. IUGR).

- ii. Head circumference- better than BPD in predicting IUGR.
 - iii. Transeverse cerebellar diameter(TCD)- can be used as a method to assess gestational age.
 - iv. Abdominal circumference(AC)- AC and fetal wt are most accurate ultrasound parameters for diagnosis of IUGR.
- AC has highest sensitivity and greatest negative predictive value for sonographic diagnosis of IUGR

Ultrasound diagnosis of IUGR

- Growth
- Measure the fetus – biometry
 - Head circumference
 - Abdominal circumference
 - Femur length
- Measure the amniotic fluid- AF index, SDP
- Evaluate the blood flows- Dopplers!

Sonographic Criteria for Diagnosing IUGR

- ▶ elevated HC/AC ratio (positive predictive value 62%)
- ▶ elevated ratio of femur length to abdominal circumference (FL/AC)
- ▶ presence of oligohydramnios without ruptured membranes
- ▶ presence of advanced placental grade (Grannum grade 3)



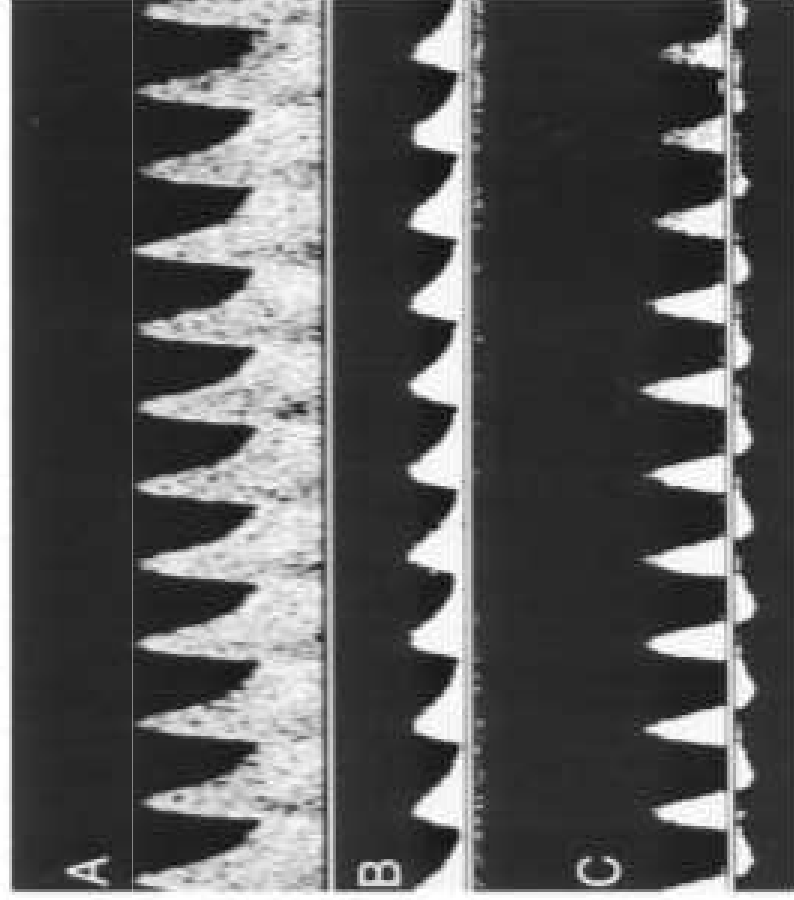
3. Doppler Ultrasonography: doppler flow studies are important adjuncts to fetal biometry in identifying the IUGR fetuses at risk of adverse outcome.

Most widely used arterial indices are :

- **Pulsatility index (PI)**: Systolic end diastolic peak velocity / time averaged maximum velocity
- **Resistance Index (RI)**: Systolic end diastolic peak velocity/ systolic peak velocity
- **Systolic to diastolic ratio (S/D)**: Systolic peak velocity / diastolic peak velocity

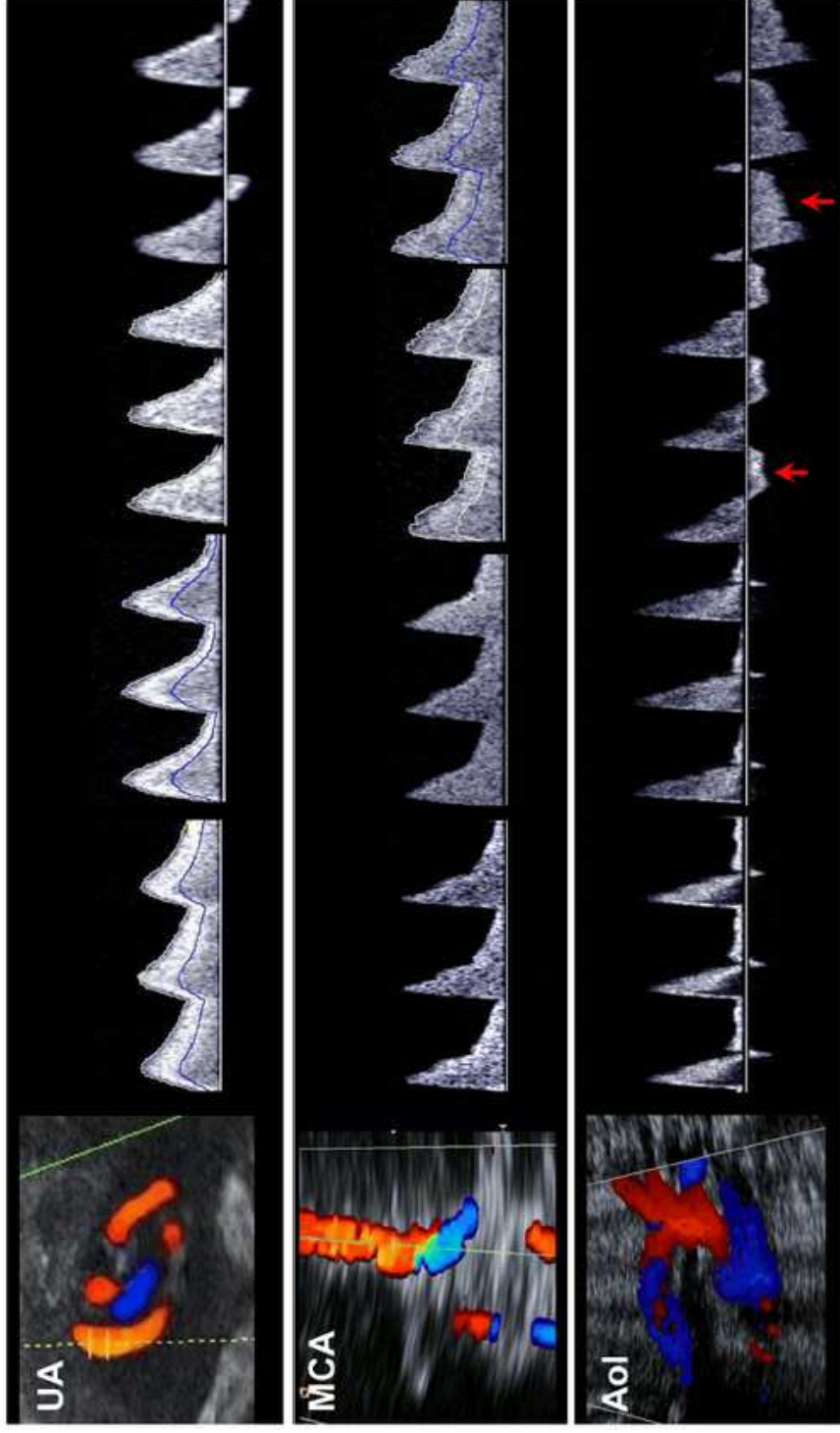
Abnormal umbilical artery Doppler velocimetry

- characterized by absent or reversed end-diastolic flow
- associated with fetal growth restriction



- A. Normal velocimetry pattern with an S/D ratio of <30 .
- B. The diastolic velocity approaching zero reflects increased placental vascular resistance.
- C. During diastole, arterial flow is reversed (negative S/D ratio), which is an ominous sign that may precede fetal demise

Control IUGR
UA-PEDF IUGR
UA-AEDF IUGR
UA-REDF



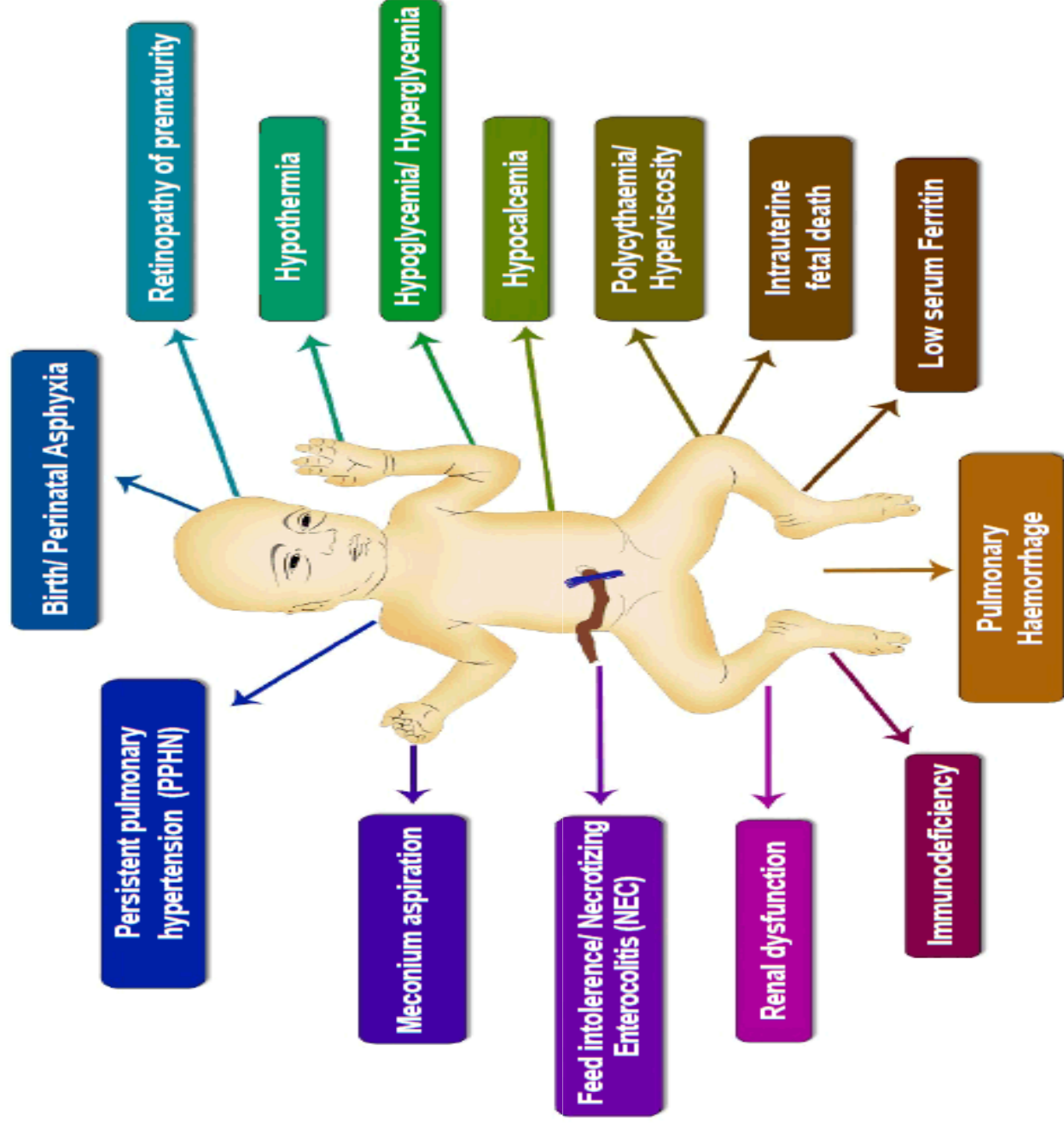
Complications of IUGR

Perinatal mortality and morbidity of IUGR infants is 3-20 times greater than normal infants.

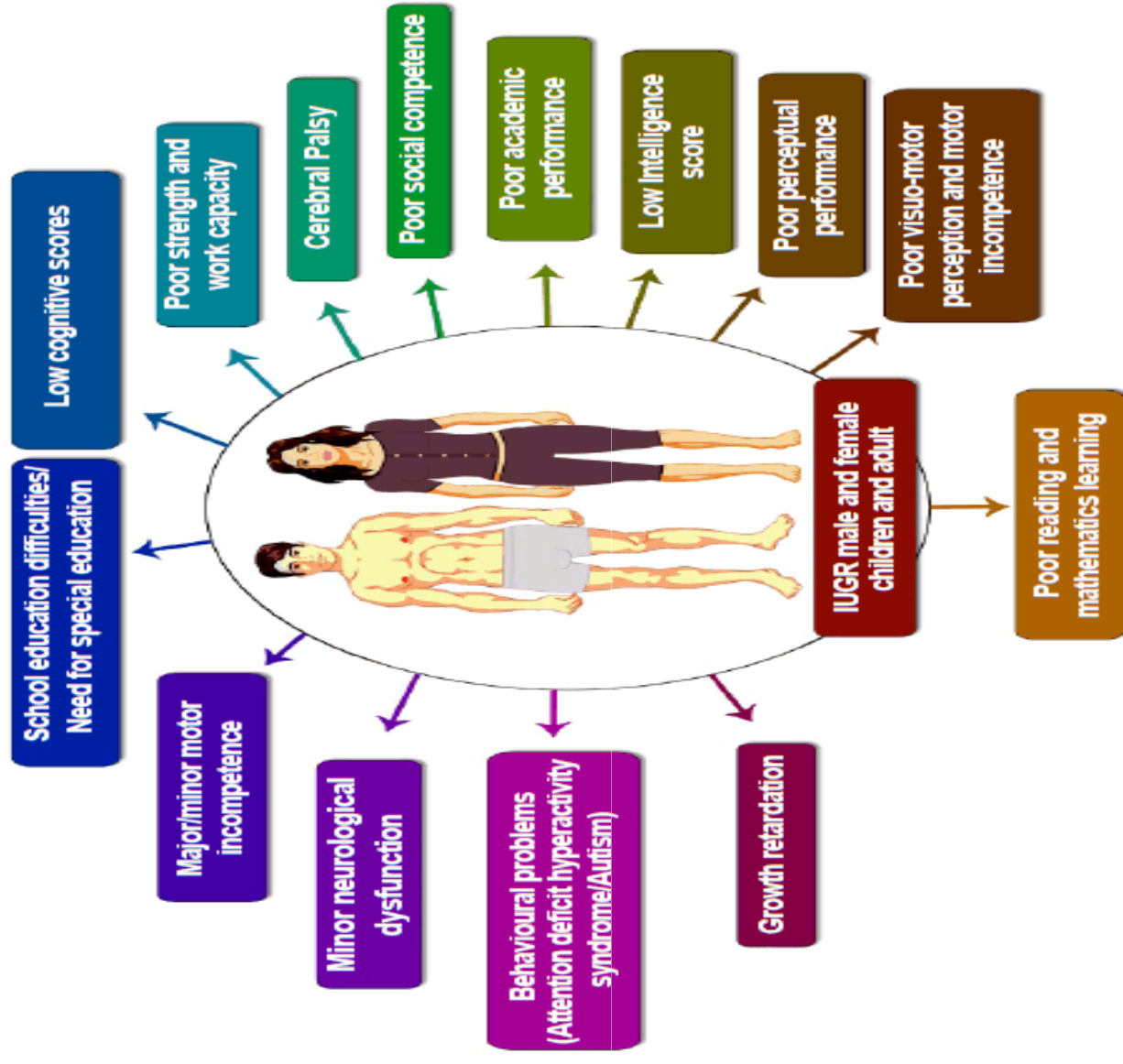
- Antepartum period- increased incidence of-
 - still births*
 - oligohydramnios*
- ✓ IUGR is found in 52% of unexplained stillbirths.
- During labour- higher incidence of-
 - meconium aspiration
 - fetal distress
 - intrapartum fetal death

Complications cont..

- Childhood- increases mortality from-
 - infectious diseases
 - congenital anomalies
- Incidence of cerebral palsy are 4-6 times higher.
- Subtle impairment of cognitive performance and educational underachievement.
- Long term complications- increased risk of coronary heart disease, hypertension, type II diabetes mellitus, dyslipidaemia and stroke.



Short term neonatal complications seen in intrauterine growth restricted neonates.



Increased risk for various physical and neurodevelopmental problems in intrauterine growth restricted neonates when they reach their childhood and adulthood.

Management

1. Treatment is individualized
2. Goal of management is to deliver the most mature fetus in the best physiological condition possible
3. Management of pregnancy depends on a surveillance plan that maximizes gestational age while minimizing the risks of neonatal morbidity and mortality
4. Administer glucocorticoids to women likely to deliver before 34wks
5. Optimal timing for delivery of IUGR is still controversial
6. C/S indicated when there is evidence of fetal compromise, malpresentation, or when traumatic delivery is anticipated
7. Labor is particularly stressful to IUGR fetus, therefore C/S preferred
8. Continuous electronic FHR monitoring should be done during labor



Management

- Antenatal diagnosis and management is the key to proper management of IUGR
- Delivery and Resuscitation
 - appropriate timing of delivery
 - skilled resuscitation should be available
 - prevention of heat loss
- Hypoglycemia
 - close monitoring of blood glucose
 - early treatment (IV dextrose, early feeding)

Management

● Hematological Disorder

- Hematocrit to detect polycythemia
- CBC with differential to rule out leukopenia or thrombocytopenia

● Congenital infection

- Infant should be examined for signs of congenital infection (eg.rash, microcephaly hepatosplenomegaly, lymphadenopathy, cardiac anomalies etc....)
- TORCH titer screening
- Examination of urine, nasopharynx
- Head CT to rule out calcification



Management

● Genetic anomalies

- screening as indicated by physical exam
- chromosomal analysis (infant with dysmorphic features)

● Others

- serum calcium to r/o hypocalcemia
- fractionated bilirubin secondary to polycythemia.
congenital infection
- urine, meconium for substance abuse

Thank you