

## THE PLACENTA: TO KNOW ME TO IS LOVE ME

Fetal Indication: Low Apgar Score

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Developed in 1952 by Dr. Virginia Apgar, Apgar scoring is a quick way to assess the state of the newborn at birth. It consists of 5 different elements: heart rate, respiratory rate, tone, reflex irritability and color; each is scored 0 (absent), 1 (abnormal), or 2 (normal) at one and at five minutes. The score is useful to identify those neonates who might require resuscitative measures immediately after birth.

asphyxia. Consequently, the placenta grossly may show nothing, meconium, or changes associated with the specific etiology of the fetal distress. Microscopically it may show chronic ischemic changes highly suggestive of perinatal asphyxia, including: avascular villi, fetal nucleated red blood cells, intravillous hemorrhages, fetal vascular intimal fibrin "cushions," and intervillous fibrin.

2) Apgar score of 3 or less at 5 minutes; 3) postnatal hypoglycemia (30 mg/dl or less); 4) neonatal disseminated intravascular coagulation; 5) neonatal acidosis (pH 7.2 or less); 6) neonatal seizures within 24 hours of delivery.

An Apgar score of 0-3 at 5 and 10 minutes is associated with a slightly increased risk for cerebral palsy (CP). A low

### Apgar Scoring

Signs	0	1	2
<i>Heart Rate</i>	Absent	Slow (<100)	Over 100
<i>Respiratory Effort</i>	Absent	Slow, irregular	Good, crying
<i>Muscle Tone</i>	Limp	Some flexion of extremities	Active motion
<i>Reflex Irritability</i>	No response	Grimace	Cry or cough
<i>Color</i>	Blue or pale	Body pink, extremities blue	Entirely pink

7-10: excellent transition to extrauterine life requiring no special treatment.

3-6: moderately depressed infant requiring tactile stimulation, oxygen or assisted ventilation.

0-3: severely depressed infant, considered to be hypoxic, requiring immediate intubation, resuscitation or ventilation.

The one minute Apgar score assesses respiratory function, so appropriate resuscitation can be provided if necessary. It is not, however, a reliable index of asphyxia. This is better assessed by the infant's acid/base state, as measured from arterial and venous umbilical cord blood samples. The five minute Apgar score is a better predictor of long term outcome. Of infants with a score of 2 or less, 78% do not survive the neonatal period compared to those with scores of 8 or greater, of which only 1% die during the first 28 days. Ninety percent of infants score 7 or above; infants with scores of 6 or above usually do not need immediate or special treatment. Premature infants often have lower Apgar scores due to immaturity, so the correlation between the Apgar score and the infant's condition is not as direct.

Abnormal Apgar scores can have variable causes, many of which are unrelated to intrapartum hypoxia or

Apgar scores correlate poorly with cause and/or outcome. Some elements of the score (e.g. tone, color and reflex irritability) are partially dependent upon the physiologic maturity of the infant. Consequently, the normal premature infant may have a low score because of immaturity and not because of anoxia or cerebral depression. Maternal sedation or analgesia may diminish tone and responsiveness. Neurologic conditions (e.g. muscle disease and cerebral malformations) may diminish tone and respiration. Cardiopulmonary abnormalities may interfere with heart rate, respiration and tone. Therefore, a low Apgar score should not be equated with asphyxia or future neurologic outcome.

Although the criteria to diagnose perinatal asphyxia varies, it should be considered if two or more of the following are present: 1) cesarean section due to late decelerations or other sign of fetal distress;

5 minute Apgar score alone does not prove CP diagnosed later was caused by perinatal asphyxia. Cerebral asphyxia may be brief or transient, and may therefore be expressed as a low Apgar score at 5 minutes; but cerebral hypoxia substantial enough to lead to CP can be presumed only when three criteria are met: 1) Apgar score of 0-3 at 10 minutes in the absence of other causes; 2) neonate remains hypotonic for at least several hours; 3) neonate has seizures. In the absence of these criteria, subsequent neurologic deficits cannot be attributed to perinatal asphyxia.