APGAR SCORE

Keywords:	Apgar score: Assessment, predictive value
Authors:	Kelsey M. Repine MD, Debnath Chatterjee MD, Children's Hospital Colorado, Aurora, CO.

Question

You are called to help in the resuscitation of a newborn male who was just delivered following an emergency cesarean section. Upon examination, he is crying, grimacing to stimulation, and his extremities are blue. He bends his arms and legs when the labor and delivery nurse picks him up. His heart rate is 107 BPM. What is this newborn's Apgar score?

A. 4
B. 5
C. 6
D. 7

Key Points

- Components of Apgar score include appearance, pulse, grimace, activity, and respiration.
- APGAR scores are performed at 1 and 5 minutes of life and repeated every 5 minutes until 20 minutes of life if the score at 5 minutes is less than 7.
- A 5-minute Apgar score of 7-10 is reassuring, 4-6 is moderately abnormal, and 0-3 is low.
- An Apgar score only reflects a neonate's clinical status *at one point in time* and should not be used to guide neonatal resuscitation or to diagnose asphyxia.

History of the APGAR Scoring System

In 1952, Dr. Virginia Apgar, an obstetric anesthesiologist at Colombia University, created the Apgar scoring system to standardize the rapid assessment of newborns in the first minutes of life.[1,2] The Apgar scoring system quantifies the clinical signs of neonatal distress, including bradycardia, pallor, hypotonia, apnea, respiratory depression, and cyanosis.[1,2] Even though the Apgar score is commonly thought of as an acronym, it was originally named after Dr. Apgar.

The Apgar score is widely used as an assessment tool and is endorsed by the American College of Obstetrics and Gynecology (ACOG) and the American Academy of Pediatrics.[1,2]

Components, Timing, and Interpretation of the Apgar Score

	0 Points	1 Point	2 Points
Appearance	Pale or cyanotic	Centrally pink with peripheral cyanosis	Pink
Pulse	Asystole	HR < 100	HR > 100
Grimace	No response to stimulation	Grimacing to stimulation	Cries, coughs, sneezes to stimulation
Activity	Hypotonia	Some tone, flexion	Active motion, flexion that resists extension
Respiration	Apneic	Irregular, slow, weak respirations	Crying

Table 1: Components of Apgar score (Adapted from Simon LV et al. Stat Pearls[2])

Timing: 1 and 5 minutes of life.
If the 5-minute score is < 7, repeat every 5 minutes until 20 minutes of life.[1,2]

Interpretation:

- The Apgar score only reflects a neonate's clinical status at one point in time and includes subjective components. It should not be used to guide resuscitation efforts.[1]
- Low Apgar score at 1 min does not predict adverse clinical outcomes as it will likely resolve by 5 minutes.[2]
- The ACOG Task Force on Neonatal Encephalopathy defines the 5-minute APGAR score of 0-3 as low and concerning, 4-6 as moderately abnormal, and 7-10 as reassuring.[3]
- The Apgar score does not predict **individual** neonatal mortality or neurologic outcomes.[1] However, based on population studies, APGAR scores of less than 5 at 5 and 10 minutes confer an increased relative risk of cerebral palsy in **large populations**. This increased risk is as high as 20-to-100-fold higher than infants with 5-minute Apgar scores of 7-10.[1]
- A recent population-based cohort study in Sweden found an increased risk of cerebral palsy and seizures with lower Apgar scores at 5- and 10-minutes. [4]

Use of Apgar Score and Limitations

Appropriate uses of Apgar scoring include[1]:

- Evaluate a neonate immediately after birth at 1 and 5 minutes of life.
- Evaluate the effectiveness of resuscitation efforts started before 1 min of life.
- Evaluate a neonate *one moment in time*, understanding that this may change with the next Apgar evaluation.[2]

Apgar scoring should NOT be used to[1,2]:

- Guide resuscitation efforts.
- Establish a diagnosis of asphyxia.

Confounders to Apgar scoring include[1,2]:

- Maternal sedation or anesthesia
- Congenital malformations
- Gestational age
- Birth weight
- Trauma
- Interobserver variability
- Maternal medications

References

1. American Academy of Pediatrics Committee on Fetus and Newborn, et al. The Apgar score. Pediatrics. 2015; 136(4): 819-22.
2. Simon LV, Hashmi MF, Bragg BN. Apgar Score. In: StatPearls, NIH National Library of Medicine. [Internet]. Treasure Island (FL): StatPearls Publishing; 2022. Link
3. ACOG. Executive summary: Neonatal Encephalopathy and Neurologic Outcome. 2nd edition. Obstet Gynecol. 2014;123(4): 896-901.
4. Persson M, et al. Five- and 10-minute Apgar scores and risks of cerebral palsy and epilepsy: population-based cohort study in Sweden. BMJ. 2018;360: k207.

Answer: D. The newborn has an Apgar score of 7 based on the following: Crying – 2 points; Grimacing – 1 point; Peripheral cyanosis – 1 point; Flexion of extremities – 1 point; Heart Rate – 2 points.

Published: 8/12/22