

PROTOCOL #12 - Maternal Fetal Medicine, University of New Mexico

BIOPHYSICAL PROFILE (BPP)

A. General

Real time ultrasound has extended benefits beyond measurement of AFV. It allows the clinician to observe more integrated functions of the fetus as well. The BPP is a function of that observation. It has been developed and modified in order to better determine which fetuses are truly compromised and which are not.

B. Indications

1. Patients with a nonreactive NST
2. Any patient where further confirmation of fetal well being is desired

C. Technique

1. The patient is placed into a supine position for real time ultrasonography.
2. The BPP is then performed with selective data recorded, i.e., images for the assessment of amniotic fluid.
3. As with all testing requiring interpretation, the person interpreting the results shall be certain that the patient's name and the date of the testing are recorded on whatever forms are used and duly logged in the patient's medical record along with the name of the person interpreting those results and any other pertinent data, such as gestational age, diagnosis, reason for test, etc.

D. Ultrasound Findings

1. The following table shows how each BPP is scored. NOTE: The results are either two or zero. A total of 8 points is possible with the BPP. A total of 10 points can be assigned if an NST has been done and is reactive.

Biophysical Variable	Normal (Score=2)	Abnormal (Score=0)
1. Fetal breathing Movements (FBM)	≥ one episode of at least 30 sec. duration in 30 min.	Absent or no episode ≥ 30 sec. duration in 30 min.
2. Gross body movements	≥ 3 discrete body/limb movements in 30 min. (episodes of active continuous movement considered a single movement.)	≤ 2 episodes of body/limb movements in 30 min.
3. Fetal tone	≤ one episode of active extension with return to flexion of fetal limb(s) or trunk: opening & closing of hand considered normal tone.	Either slow extension with return to partial flexion or movement of limb in full extension or absent fetal movement.
4. Reactive fetal heart rate (NST)	≥ 2 episodes of acceleration of ≥15 bpm and at least 15 sec. duration in 20 min.	≤ one acceleration or acceleration <15 bpm in 20 min.
5. Quantitative AFV	≥ one pocket of fluid measuring at least 2 cm in 2 perpendicular planes.	Either no amniotic fluid pockets or a pocket <2 cm in 2 perpendicular planes.

* Interpretation of NST for gestations 32 weeks or less is: ≥ 2 episodes of accelerations ≥ 10 bpm lasting at least 10 seconds.

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2. By adding up the scores obtained above, one can now use the following table to determine patient management.

SCORE	INTERPRETATION	MANAGEMENT
10	Normal infant; low risk of chronic asphyxiation	Repeat testing at weekly intervals; repeat 2X weekly in diabetics and patients ≥ 40 weeks' gestation.
8	Normal infant; low risk of chronic asphyxiation	Repeat testing at weekly intervals if primary method of following patient; repeat testing 2X weekly in diabetics, patients with non-reactive NST, patient ≥ 40 weeks' gestation and patient with vascular disease. Consider delivery if oligohydramnios is present.
6	Suspect chronic asphyxia	Repeat testing within 24 hours; strongly consider delivery if oligohydramnios is present. Discuss with MFM faculty.
4	Suspect chronic asphyxia	If ≥ 34 weeks' gestation and conditions favorable, deliver; if < 36 weeks and L/S < 2.0 repeat test, same day; if repeat < 4 , deliver. Discuss with MFM faculty.
0-2	Strongly suspect chronic asphyxia	Consider delivery, regardless of gestational age. Discuss with MFM faculty.

***Note:** Must observe fetus for a total of 30 minutes before assigning a 0 score for any of the BPP variables.

STAGING:

Normal BPP = 8/8 or $\geq 8/10$ with NST

Equivocal BPP = 6/8 or 6/10 with NST

Abnormal BPP = $< 6/8$ or $< 6/10$ with NST

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INTERPRETATION:

A BPP/NST $\geq 8/10$ accurately predicts normal tissue oxygenation.

-A normal BPP is nearly ever associated with acidemia; it has a false negative rate $< 1\%$.

Whereas, a BPP/NST $\leq 6/10$ relatively accurate predictor of acidemia.

A BPP/NST of 0/10 has near 100% sensitivity for acidemia.

Alternative:

MODIFIED BIOPHYSICAL PROFILE (MBPP)

Consists of NST and ultrasonic assessment of amniotic fluid.

This is a shortened method of the BPP.

It is accepted as a first-line screening test and should be followed by the complete BPP as a back-up test when indicated.

The amniotic fluid can be assessed using one of two techniques: 1) measurement of the single deepest pocket (SDP) or 2) measurement of the Amniotic Fluid Index (AFI).

CONSULTATION:

Obtain Doppler study of the Umbilical artery if BPP is abnormal.

Twenty-four hour consultation is available by calling the Maternal Fetal Medicine service at the University of New Mexico Hospital. 1-888-866-7257.

SELECTED REFERENCES:

1. Lalor JG et al: Biophysical profile for fetal assessment in high risk pregnancies (Review). The Cochrane Library. Issue 3, 2009
2. Magann EF et al: Biophysical profile with amniotic fluid volume assessments. Obstet Gynecol. 104(1):5-10, 2004
3. Odibo AO et al: What antepartum fetal test should guide the timing of delivery of the preterm growth-restricted fetus? A decision-analysis. Am J Obstet Gynecol. 191(4):1477-82, 2004
4. Manning FA: Fetal biophysical profile: a critical appraisal. Clin Obstet Gynecol. 45(4):975-85, 2002