

Assessment of the fetal bioprofile during labor by fetal ECG analysis

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Today, the fetal bioprofile generated during labor and delivery consists of a static assessment of fetal heart rate (FHR). The stress generated by uterine activity provides a means of testing the ability of the fetus to meet the challenges of being born. FHR patterns are valuable for identifying normality, and patterns identifying fetal reactivity (variability and accelerations) are most useful for immediate fetal surveillance. Complexity becomes vast when abnormality is detected, owing to active fetal adaptation to stress and variations in the ability to cope. Thus, each fetus has its own pattern of reactions and bioprofile to be considered. The fetal ECG, forming the basis for FHR monitoring, has been shown to be a clinically useful source of information reflecting both autonomic nervous system (FHR patterns, beat-to-beat variation) and heart muscle reactivity (ST waveform changes). Automatic assessment of the ST forms the basis for the new STAN[®] fetal surveillance methodology, and additional decision support is being developed in order to optimize the use of the fetal ECG in general and fetal reactivity measures in particular. This article presents the current basis for ST analysis of the fetal ECG as an adjunct to standard electronic fetal monitoring and discusses new developments in the automatic quantification of beat-to-beat variations.