

# Comparison between Figo and Nichd Criteria in Assessing Fetal Heart Rate

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## ABSTRACT

Assessing the fetal heart rate (FHR) is one of the most important aspects of antenatal care and delivery. Fetal heart rate is one indicator of fetal well-being. Assessing FHR can be done by auscultation or by using a cardiotocography (CTG) device, also known as an Electronic Fetal Monitor (EFM). In interpreting the results of the cardiotocography examination, there are two criteria used to interpret the condition of the fetus, namely the criteria issued by the International Federation of Gynecology and Obstetrics (FIGO) and the National Institute of Child Health and Human Development (NICHD).

**Keywords:** Comparison, fetal heart rate, FIGO criteria, NICDH criteria.

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## I. INTRODUCTION

Fetal heart rate (FHR) is an indicator or in an obstetrical examination which indicates that there is life in a mother's womb. To check the health of the fetus in the womb of pregnant women, doctors perform several checks and the baby's heart rate can only be detected at approximately 12 weeks of age. Monitoring Continuous monitoring of fetal parameters serves to assess fetal well-being. One of these parameters is the fetal heart rate (FHR).

Continuous FHR monitoring was found to reduce fetal mortality. In addition, through this activity, fetuses experiencing difficulties/distress can be immediately identified and intervened, thereby increasing the outcome for the fetus. FHR examination is also included in the antenatal care service, which is generally carried out in the second and third trimesters. Examination of the fetal heart rate should be done periodically, one way is by using auscultation and cardiotocography (CTG) / electronic fetal monitoring (EFM) [1]-[3].

In interpreting the results of the cardiotocography examination, there are two criteria used to interpret the condition of the fetus, namely the criteria issued by the

International Federation of Gynecology and Obstetrics (FIGO) and the National Institute of Child Health and Human Development (NICHD). In addition to interpreting FHR, it can also be used to plan further management. The information obtained can be integrated with other clinical knowledge so that interpretation and subsequent management are comprehensive and adequate. Basically, if the fetus has a stable baseline FHR with convincing variability, then the risk of hypoxia in the fetal central organs is unlikely [4].

## II. CRITERIA DESCRIPTION CTG BASED ON FIGO

Various factors such as gestational age and maternal drug administration could influence pulse heart fetus, so that analysis CTG need linked to the mother's clinical information for interpretation and proper handling.

If the fetus maintains a stable baseline with normal variability, the risk for central organ hypoxia is very high small. But handling clinical must based on on classification patient. Description CTG based on International Federation of Gynecology and Obstetrics (FIGO) classified Becomes three groups, namely categories I, II, and III [4].

TABLE I: CTG CRITERIA BY NICHD

Classification	Information
Category I tracing	FHR baseline: 110 - 160 bpm Variability: moderate (6 - 25 bpm)
	Decelerations: no late decelerations and variable decelerations, early decelerations may or may not be present Acceleration: maybe/no
Category II tracing	FHB does not meet category I and category III Variability: The baseline FHR has no variability, and meets one of the following: Repeated slow deceleration Repeated variable deceleration Bradycardia (FHB < 110 bpm) or baseline FHR with sinusoidal pattern

TABLE II: CTG CRITERIA BY FIGO

Classification	Information
Normal	FHB baseline: 110 - 160 bpm Variability: 5 - 25 bpm Decelerations: no repeated decelerations
Suspicious	Interpretation: fetus without hypoxia/acidosis At least 1 of 3 normal signs is not met No pathological findings Interpretation: fetus with low probability of hypoxia/acidosis
Pathological	FHR baseline: < 100 bpm Variability: decreased > 15 minutes, increased > 30 minutes or sinusoidal pattern Decelerations: repeated slow decelerations or prolonged decelerations > 30 minutes or 20 minutes if 1 prolonged deceleration > 5 minutes Interpretation: fetus with high probability of hypoxia/acidosis.

III. CRITERIA DESCRIPTION CTG BASED ON NICHD

National Institute of Child Health and Human Development (NICHD) published guidelines for interpretation of GTC in 2008. Three categories in interpretation pulse heart fetus [5].

A. Category I

Category one is condition normal from monitoring FHB and describe the acid-base status of the fetus when monitoring is in normal. Category I can be monitored at routine antenatal care checks and no need governance special.

B. Category II

Category II does not predict fetal acid-base status abnormalities. moment this not yet found proof which adequate for classify category this Becomes Category I or Category III. Category II need further evaluation and monitoring as well as reevaluation and looking for factors

which related with state clinical. On a number of state required diagnostic tests to confirm fetal well-being status or perform resuscitation intrauterine on results Category II this.

C. Category III

Category III related with abnormality status sour language on moment fetal monitoring was performed. Category III requires a thorough evaluation good (accurate). In this condition, various actions can be taken such as give oxygenation for Mother, change position Mother, stop stimulation of labor, management of maternal hypotension, and management of tachysystole. If action the no succeed, consider for termination pregnancy.

IV. DISCUSSION

Basically, the NICHD (2008) and FIGO (2015) classification methods categorize the fetal heart rate into 3 groups: normal, suspicious (suspicious/indeterminate) and pathological. Classification was determined based on findings on baseline rate, variability, decelerations, and accelerations on cardiotocographic readings (external fetal monitoring). The differences in operational definitions of each category based on the NICHD and FIGO classification methods can be seen in Table II.

The first difference between the NICHD (2008) and FIGO (2015) classifications is in the definition of deceleration for category I. In the NICHD classification, slow and variable decelerations cannot be classified into category I while in the FIGO classification, any decelerations of any kind that are not repeated can still be classified. into category I. The second difference is in the criteria for category II. The category II criteria for the NICHD classification are more detailed than the FIGO classification, which only states that category II is all cases that cannot be classified in either category I or III. The third difference is in the addition of the duration criteria for the FIGO classification, namely prolonged decelerations and prolonged decelerations.

In one study conducted by [6] 100 GCT readings were evaluated by 4 independent observers who categorized the data using the NICHD and FIGO classifications. Then, the data is divided into 2 categories, namely reassuring and non-reassuring. After processing the data, it was found that there were 19 category I data (NICHD) and 25 category I data (FIGO). Then 17 category II data (NICHD) and 6 category II data (FIGO). Finally, found 0 category III data (NICHD) and 5 category III data (FIGO). In the 2-tier classification (reassuring vs. non-reassuring), 85.5% (NICHD) and 94.5% (FIGO) normal data (category I) were found [3].

TABLE III: CTG NICHD

NICHD	Normal	Suspicious	Pathological
Baseline	110-160 bpm	Bradycardia not accompanied by absent variability Tachycardia	Channel c
Miscellany ability	Moderate	Activity minimal variability Absent variability not accompanied by repeated decelerations Marked variability	
Desele constellation	No late decelerations and variable decelerations Early decelerations may or may not be present	Recurrent variable decelerations with minimal/moderate variability Slow decelerations > 2 minutes but < 10 minutes Recurrent slow decelerations with moderate variability Variable decelerations with other characteristics	Absent variability and one of the following: Recurrent late deceleration, recurrent variable deceleration, bradycardia, sinusoidal pattern

TABLE IV: CTG FIGO

FIGO	Normal	Suspicious	Pathological
Baseline rate	110-160 bpm		<100 bpm
Variability	5-25 bpm		Decreased, increased, or sinusoidal pattern
Deceleration	Not repeated	At least 1 of the 3 normal signs is not met, with no pathological findings	Recurrent slow decelerations or prolonged decelerations > 30 minutes or 20 minutes if variability is decreased, or prolonged decelerations > 5 minutes
Acceleration	-		-

## V. CONCLUSION

The NICHD (2008) and FIGO (2015) criteria are two criteria that are commonly used to determine fetal well-being from cardiotocographic FHR measurements. Both methods have a 3- tier system, in which there are 3 categories: normal, suspicious, and pathological, and share similar criteria with some differences in details. One study comparing the NICHD and FIGO classifications found unequal results for determining the interpretation of FHR.

## CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

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