



# CTBT

Centre for Transfer of  
Biomedical Technology

## TECHNOLOGY SUMMARY



### Technology owner

University Hradec Králové  
University Hospital Hradec Králové

### Inventor (s)

Filip Studnička, Ph.D.  
and team of inventors  
Prof. Marian Kacerovský, Ph.D.

### IPR status

CZ Patent application PV 2021/360,  
future PCT application

### Stage of Development

Prototype testing in progress

### Contact

Lucie Barošová, Ph.D.  
[lucie.bartosova@fnhk.cz](mailto:lucie.bartosova@fnhk.cz)  
+420 727 802 314

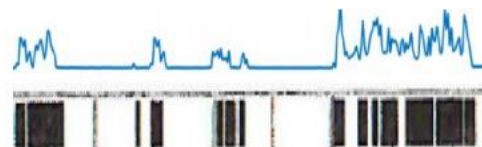
## Fetal Activity Monitor

### Background

Subjective monitoring of fetal movement activity of pregnant woman is a simple and effective method to verify physiological condition of the fetus. Mother perceives the characteristics and frequency of fetal activity during the day throughout second half of pregnancy and is able to identify when fetal activity is present. By the time mother realizes that she no longer feels fetal activity and visits the doctor, it is usually too late and the fetus is dead (4 deaths per 1000 children born per year in Czech Republic). Despite comprehensive prenatal care for pregnant women, this number has not been reversed in the last 20 years. The aim of fetal movement activity monitors is to provide monitoring of the fetal movement activity (during the sleep and in case of certain doubts during the day) so that the pregnant woman visits the doctor in time when suspects changes in the natural characteristics of the movements in order to prevent fetal death.

### Description of the Invention

A system of sensors placed under the mattress of the pregnant women was developed. The data obtained from the sensors were compared with the actograms of pregnant women (fetal movement activity records) obtained by the CTG (cardiotocography). The graph shows a comparison of the output from the actogram (black curve indicating fetal movement activity) with calculated fetal movement activity detected by the sensors in the pad. In the calculated activity is then possible to determine a threshold value above which the fetal movement activity is considered relevant. Further development would consist in optimizing the parameters of the algorithm to determine present movement activity in order to improve basic characteristics of the method, sensitivity, resp. specificity, which is now 80%, resp. 60%.



### Advantages

- Simple and easy to use
- Non-wearable
- Homecare / Medical facility use
- Automatic evaluation giving an information when the last sufficiently intense activity of the fetus occurred after about 15 minutes of measurement
- CE mark (ČSN EN 61326-1 ed.2:2013)

### Potential Applications

Our device is intended to be used by all pregnant women (with physiological or pathological pregnancies) either for non-medical home care area or as a medical device class Im for monitoring fetal activity.