



Office of Technology Management

System for Extracting Fetal ECG from Maternal ECG as early as 12th Gestation Week

Technology Reference

CX022

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Field

Medical Devices
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License Status

Seeking
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Patent Status

Patent Applications
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Overview

Noninvasive extraction of fECG is generally not possible except late in the pregnancy, due to difficulties in separating the fECG signal and differentiating it from the maternal ECG (mECG) and from interfering non-ECG noises. However, for effective treatment of fetal cardiac problems, it is of utmost importance to obtain fECG as early as possible in the pregnancy, preferably as early as the 12th gestation week. However, in the 12th gestation week, the mECG may be up to several thousand times stronger than the fECG, and other interfering noises are 100 times stronger than fECG, thus limiting the ability of medical personnel to accurately define the fECG.

Technical Summary

University of Illinois at Chicago researchers have developed a way to allow medical personnel to non-invasively extract a fetal ECG (fECG) from an ECG of a pregnant woman in early weeks of gestation (12th week). It also gives the personnel the ability to separate fetal ECG from non ECG noises.

This technology achieves this separation online, in real-time, with less than a 1 second processing delay. It allows obtaining the fECG using a high resolution ECG and electrodes. Generally, multiple ECG electrodes are placed on the pregnant woman's chest and abdomen, but only one electrode is required in this technology.

Benefits

- Prevents the cascade of heart failure, hydrops and fetal death
- Measures the fetal ECG
- Provides important data to medical personnel
- Allows early detection of fetal heart failure (12th week of gestation)

Areas of Application

- Fetal ECG
- Fetal heart abnormalities detection
- Fetal arrhythmia detection
- Early gestation fetal ECG retrieval

Stage of Development

- Demonstrated on patient data