Detects Preeclampsia Early Warning Signs in Expecting Mothers to Minimize Mortality

Sensors on this device attach to a patient’s body to monitor for physiological changes associated with preeclampsia symptoms. The device generates and reports derived data to healthcare professionals who can facilitate treatment and progress to delivery, which is the only cure for preeclampsia, even in preterm pregnancies. Left untreated, preeclampsia can rapidly and unexpectedly worsen to life-threatening hypertension, seizures, pulmonary edema and coagulation system effects. Preeclampsia is a major cause of maternal and neonatal morbidity and mortality around the world. The Preeclampsia Foundation reports approximately 76,000 maternal and 500,000 infant deaths per year due to preeclampsia, but no readily available non-invasive tests to diagnose preeclampsia currently exist.

Researchers at the University of Florida have developed a device to monitor expecting mothers for early warning signs of preeclampsia. Made from inexpensive and/or reusable materials, the device is portable and can be flexible, making it wearable as an armband, for instance. Data collected can be processed and displayed with an accompanying user interface.

Application

Early detection and diagnosis of preeclampsia

Advantages

- Provides real-time monitoring and point-of-care prediction, eliminating any delay caused by the need for lab results
- Identifies high-risk patients during prenatal visits, preventing development of the disease into its more severe form
- Distinguishes between the symptoms of preeclampsia and hypertension, reducing the frequency of misdiagnosis
- Requires no calibration or chemical testing and minimal maintenance, making it a low-cost and easy to use

Technology

The sensor device uses a pulse oximeter probe and at least one electrocardiogram lead and can be formed into a flexible wearable, such as a wrist band. The sensor communicates with a processor, which funnels data gathered by the sensor through algorithms into an interface that reports the likelihood of current or future preeclampsia. The sensor device is portable/wearable and can be produced from inexpensive
and/or reusable sensor technologies. It provides an inexpensive, non-invasive system and method for predicting and/or diagnosing preeclampsia in a patient. It can operate as an early-warning prediction system, often detecting preeclampsia prior to development of conventional symptoms, facilitating treatment and/or delivery or transfer planning.

**Inventors**

**Tammy Y. Euliano, M.D.,** is a professor of anesthesiology and obstetrics & gynecology at the University of Florida. Dr. Euliano completed her M.D. her undergraduate degree, anesthesiology residency and a fellowship in obstetric anesthesiology all at the University of Florida. Her research interests focus on maternal-fetal monitoring and preeclampsia detection. She works closely with UF startups, Convergent Engineering and OB Medical, and has authored 22 peer reviewed manuscripts and six patents.

**Neil Euliano, Ph.D.,** was a biomedical and electrical engineer and entrepreneur who earned his master’s degree and Ph.D. in electrical engineering from the University of Florida. The co-founder of three startup companies involving medical technology, he has been published more than forty times in scholarly journals and has 29 pending or issued patents to his name.

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