

Minimally Invasive Glucose Sensing Device

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According to the World Health Organization, an estimated 15 billion infants are born preterm every year. Preterm birth complications are the leading cause of death of children under the age of 5. Infants are considered preterm when born earlier than thirty-seven weeks. These infants are at a high risk of severe health complications requiring them to be constantly monitored. Premature infants are kept in isolettes that control their environment where they are connected to a multitude of machines that monitor their vitals constantly. Continuous health monitoring allows nurses and doctors to determine the best treatment each infant needs to facilitate growth. One of the most common blood tests is the blood glucose test. Blood for this test is collected via a heel prick, an arterial line, or venepuncture. Glucose testing needs to be performed multiple times throughout the day leading to a large cumulative sample of blood taken from the neonates. We have developed a two-component medical device that can measure interstitial fluid glucose levels that are able to be related to blood glucose levels. The first component is a sampling device that uses microneedles to collect the neonate's interstitial fluid. The second component is an analytical component that will analyze the interstitial fluid for glucose measurements. Our instrument would provide doctors with a reliable, minimally-invasive method for measuring interstitial glucose concentration, thus mitigating the need to repeatedly draw blood from the infants and reducing the amount of risk at which they are exposed.