

Noninvasive System to Monitor Feeding-Intolerant Preterm Infants

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Technology description

Multimodal, Portable Device Systematically Predicts Feeding Readiness and Reduces Complications from Enteral Feeding of Newborns

This noninvasive device combines three technologies – an electrogastrogram (EGG), near infra-red sensors (NIRS), and a biopac skin microphone to observe intestinal acoustics – to determine a preterm infant's readiness for enteral feeding. Feeding intolerance is common in preterm infants – approximately 1 out of 4 preterm infants experience difficulty with intake or digestion of formula or breast milk. Infants that are small or sick may need to get nutrition and fluids through a vein, but it is crucial for development that infants ingest and digest food. Therefore, enteral feeding, wherein food is administered into the stomach, is beneficial, but an infant first must demonstrate feeding readiness, the ability to safely ingest and digest food. Available methods to determine an infant's feeding readiness use subjective (and occasionally invasive) indicators that rely heavily on individual clinical judgment to guide enteral feeding. If feeding is too aggressive, infants can develop necrotizing enterocolitis (NEC); if feeding is too conservative, infants may experience growth failure, intestinal atrophy, increased inflammation, and an increased chance of sepsis.

Researchers at the University of Florida have developed a noninvasive monitoring system for reliable and systematic assessment of feeding readiness in feeding-intolerant preterm infants, reducing enteral feeding risks associated with guidance by available subjective monitoring methods. Additionally, this device may be applicable in predicting feeding readiness in post-surgical patients of any age, as well as patients with other intestinal disorders.

Technology

This device systematically evaluates feeding readiness by combining a near infra-red sensor (NIRS), biopac skin microphone (for intestinal acoustics), and an electrogastrogram (EGG) (for electrical activity of the bowel). This combination enables users to measure regional tissue oxygenation (via NIRS), analyze bowel sounds for objective interpretation of intestine activity associated with motility (via biopac skin microphone), and identify digestion states and persistent disturbances of stomach function (via EGG). By incorporating quantitative diagnostic information, the system can generate consistent

feeding readiness scores. This will avoid the subjectivity present in available technologies and reduce the risks associated with enteral feeding in preterm infants and other patients with intestinal disorders, leading to improved neonatal and post-surgical outcomes.

Application area

Noninvasive device that systematically predicts feeding readiness in feeding-intolerant preterm infants

Advantages

Systematically predicts feeding readiness, lowering the chance of complications associated with available subjective monitoring methods

Decreases the amount of time infants remain on intravenous feedings due to overly conservative monitoring assessments, reducing likelihood of sepsis and decreasing length of hospital stay

Portable device allows for bedside monitoring, supporting uncomplicated evaluation of feeding readiness for patients of all ages

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