



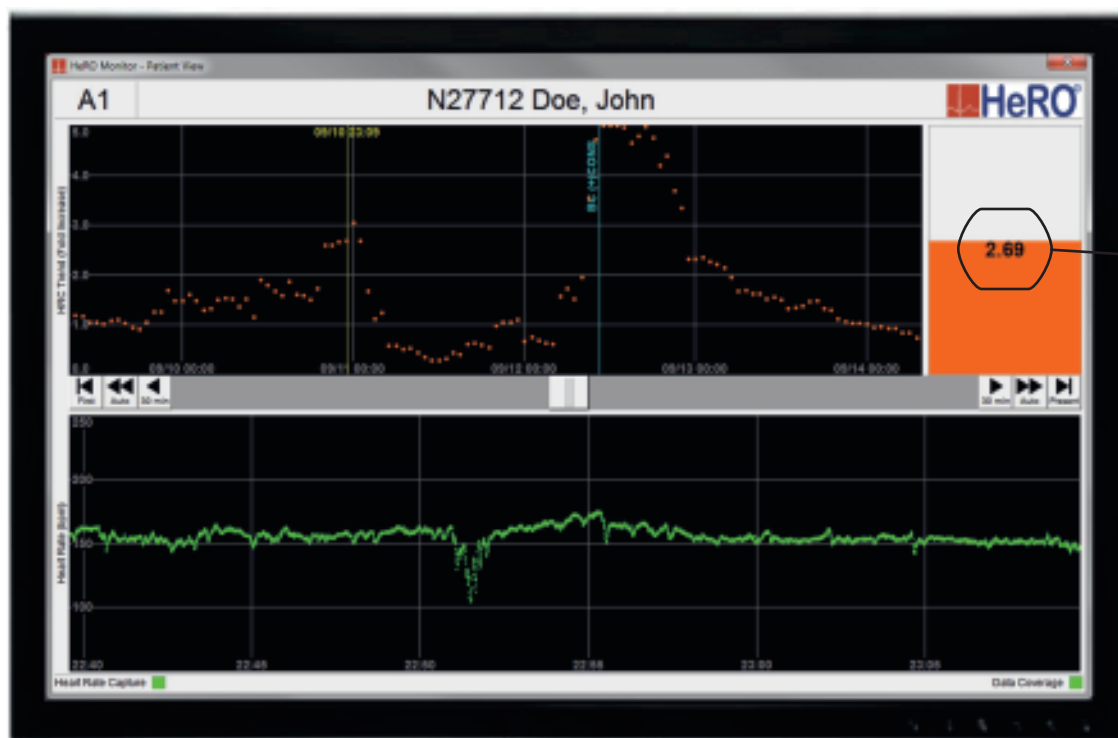
HeRO[®]

Heart Rate Observation System

the power to predict

Shown to improve patient outcomes, HeRO is a new vital sign available for the NICU.

- **HeRO** has been proven in a 3,000 patient randomized controlled trial which concluded that **HeRO** reduced mortality by 22% in very low birthweight infants.
- **HeRO** utilizes proprietary algorithms to analyze the heart rate variability of the infant and render a score representing the presence of decreased variability and transient decelerations.



HeRO Score indicates nearly a 3-fold increase in patient distress.

- **HeRO** reacts to patient distress, such as potentially catastrophic illness.
- **HeRO** is always available - no tests to order.
- **HeRO** provides valuable new vital information.
- **HeRO** is non-invasive, requires no applied parts or new patient leads, and interfaces with existing ECG monitoring equipment.



Contact MPSC:
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Heart Rate Characteristics Bibliography:

The following articles describe HeRO monitoring and clinical indications.

Some articles may discuss usage for an off-label indication of the HeRO system.

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- Moorman JR, et. al. Mortality reduction by heart rate characteristic monitoring in very low birth weight neonates: a randomized trial. *J Pediatrics*. 2011 Dec; 159(6):900-6.
- Fairchild KD, O'Shea TM. Heart Rate Characteristics: Physiomarkers for Detection of Late-Onset Neonatal Sepsis. *Clin Perinatol*. 2010; 37:581-598.
- Addison K, Griffin MP, Moorman JR, Lake DE, O'Shea TM. Heart rate characteristics and neurodevelopmental outcome in very low birth weight infants. *J Perinatol*. 2009 Nov; 29(11):750-6.
- Griffin MP, Lake DE, O'Shea TM, Moorman JR. Heart rate characteristics and clinical signs in neonatal sepsis. *Pediatr Res*. 2007 Feb; 61(2):222-7.
- Moorman JR, Griffin MP, Lake DE. Heart rate characteristics monitoring for neonatal sepsis. *IEEE Trans Biomed Eng* 2006 Jan; 53(1): 126-132.
- Griffin MP, Lake DE, Bissonette EA, Harrell FE, O'Shea TM, Moorman JR. Heart rate characteristics: novel physiomarkers to predict neonatal infection and death. *Pediatrics* 2005;116:1070-1074
- Griffin MP, Lake DE, Moorman JR. Heart rate characteristics and laboratory tests in the diagnosis of neonatal sepsis. *Pediatrics* 2005;115:937-941.
- Cao H, Griffin MP, Lake DE, Moorman JR. Increased non-stationarity of neonatal heart rate prior to sepsis and systemic inflammatory response syndrome. *Ann Biomed Eng* 2004;32:233-244.
- Griffin MP, O'Shea TM, Bissonette EA, Harrell FE, Lake DE, Moorman JR. Abnormal heart rate characteristics are associated with neonatal mortality. *Pediatr Res* 2004;55:782-788.
- Kovatchev BP, Farhy LS, Cao H, Griffin MP, Lake DE, Moorman JR. Sample asymmetry analysis of heart rate characteristics with application to neonatal sepsis and systemic inflammatory response syndrome. *Pediatr Res* 2003;54:892-8.
- Griffin MP, O'Shea TM, Bissonette EA, Harrell FE, Lake DE, Moorman JR. Abnormal heart rate characteristics preceding neonatal sepsis and sepsis-like illness. *Pediatr Res* 2003;53:920-926.
- Lake DE, Richman JS, Griffin MP, Moorman JR. Sample entropy analysis of neonatal heart rate variability. *Am J Physiol Regul Integr Comp Physiol*, 2002;283:R789-797.
- Griffin MP, Moorman JR. Toward the early diagnosis of neonatal sepsis and sepsis-like illness using novel heart rate analysis. *Pediatrics* 2001;107:97-104.



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