

SurePulse VS

The NEW wireless heart rate monitor for newborn babies



Confident Decision Making

- Accurate and reliable heart rate visible to the delivery team in real time^{1,2}
- Continuous pulse waveform
- Heart rate signal within 15-30 seconds of cap placement²
- Developed with the Faculties of Engineering and Medicine at The University of Nottingham



Optimum Sensing Location

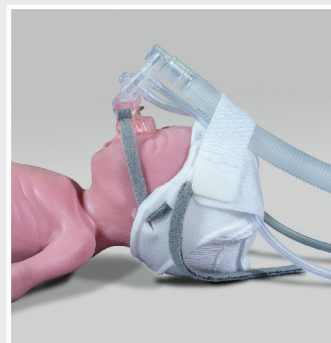


- Perfusion is maintained longer at the forehead than at the periphery^{3,4}
- The VS uses green light, which has a larger depth of modulation in the presence of pulsatile blood than red or infrared wavelengths^{5,6}
- The volume of blood under the skin surface is measured using an active optical sensor. As the volume changes, due to the heart beating, a pulsatile signal is captured and relayed wirelessly to the display monitor.

Family Centered Care

- Portable Display with 4 hour battery life
- No wires - wirelessly transmits to the bedside display
- Potentially facilitates heart rate monitoring in evolving delivery room practices
- This includes delayed cord clamping, early breast feeds, delivery room cuddles and minimally-invasive transition support

Integrates Easily into Care Pathway



- Sensor is contained within in a thermoprotective Cap² which takes seconds to fit
- 5 Cap sizes accommodate the full range of newborn head circumferences
- Cap provides fixings for breathing apparatus (CPAP)
- Fontanelle access for scanning



Auditable Records

- Birth timer
- Touchscreen Display records clinical events along with heart rate
- USB download feature provides a permanent record which supports training, clinical governance and patient safety

Comfort and Safety Designed In

- Thermoprotective Cap²
- Biocompatible materials
- Soft sensor surface with no skin damage²
- Cap usable after transfer to NICU (sensor is removable)
- Systematic, user-focused approach to design⁷
- Supports Family Centered Care



Pros and Cons of heart rate monitoring approaches for newborn babies

	Stethoscope	Pulse Oximeter	EKG/ECG	SurePulse VS
Accuracy	✗ ₈	✓ ₉	✓ ₁₀	✓ _{2,11}
Designed specifically for newborn care	✗	✗ ₁₂	✗ ₁₃	✓ ₂
Heart rate in few first minutes	✗	? ₁₄	✓ ₁₄	✓ ₂
Event logging	✗	✗	✗	✓
Developed to work with delayed cord clamping	✗	✗	✗	✓

Technical Information

Pulse Rate Accuracy	+/- 5 beats per minute
Pulse Rate Range	25-240 beats per minute
Pulse Rate Averaging	5 Seconds
Head Circumference	20-40cm
Display Battery Life	4 Hours
Module Battery Life	2 Hours per Module
Wireless Interface	2.4GHz Class II ISM
Data Storage	100 Hours
Wavelengths	530,660,940 nm
Standards	BS EN 60601-1:2006 BS EN ISO 10993:2009 BS EN 62471:2008
CE Approval	Class IIb Medical Device
FDA 510(k) Cleared	Class II K201887



Every second counts

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Refs ¹ Henry C et al; Poster at 2nd Congress of joint European Neonatal Societies, Nov 2017, Venice ² Data on File
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