

SurePulse VS

The NEW wireless heart rate monitor for newborn babies


Every second counts

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

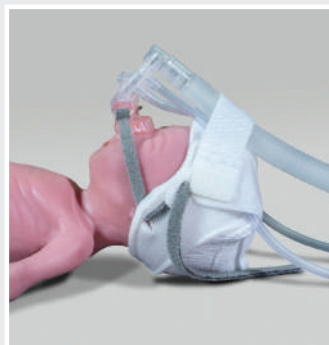


- Perfusion is maintained longer at the forehead than at the periphery^{3,4}
- The VS uses green light, which has a larger depth of modulation in the presence of pulsatile blood than red or infrared wavelengths^{5,6}
- The volume of blood under the skin surface is measured using an active optical sensor.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

Flexible Patient 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 (ETT/CPAP)
- Fontanelle access for scanning

Contact us today info@surepulsemedical.com +44 333 5771133



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



Pros and Cons of heart rate monitoring approaches for newborn babies

	Stethoscope	Pulse Oximeter	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



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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 ³ Fernandez M et al; Am J Crit Care 2007; 16:146-152 ⁴ Branson RD & Mannheim PD; Resp Care Clin North Am 2004; 10:359-367 ⁵ Crowe J & Damianou D; Proc 14th Int Conf New York IEEE 1992; vol 6:2423-2424 ⁶ Cui W et al; IEEE Trans Biomed Eng 1990; 37:632-639 ⁷ Pickup L et al; JMIR Hum Factors 2019; Vol 6; Issue 2; c12055 ⁸ Voogdt KJ A et al; Resuscitation 2010; 81:1000-1003 ⁹ Van Vonderen JJ et al; J Paediatr 2015; 166:49-53 ¹⁰ Kamlin COF; Resuscitation 2006; 71:319-321 ¹¹ Grubb MR et al; Physiol Meas 2014; 35:881-893 ¹² Narayan IC et al; Acta Paediatr 2015; 104:158-163 ¹³ Dawson JA et al; https://doi.org/10.1016/j.siny.2018.07.001 ¹⁴ Katheria A et al; Paediatrics 2012; 130:177-181

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