

Adore the gift of Parenthood by Nemocare

Parenthood is believed to be one of the biggest joys in the world, and every new parent wants nothing more than a healthy baby. Baby Rajesh's parents too were ecstatic when he was born, but their joy was short-lived when they found that Rajesh weighed less than a kilogram at birth. Chances of survival with such low birth weight were close to impossible. Baby Rajesh's parents were overjoyed when Dr. Jagdishwar saved their baby miraculously. But it was not the end of the road for baby Rajesh. Two years later, he was diagnosed with cerebral palsy, presumably due to multiple apnoeic episodes in the time he spent in the hospital fighting for survival. If only Dr. Jagdishwar had some way to tell him the distress baby Rajesh's fragile body was undergoing, timely medical intervention could have been done. Now, baby Rajesh has to spend his life as a cerebral palsy patient.

This incident jolted Manoj Sanker and Pratyusha, bio-design fellows (2016 batch) at the Centre for Healthcare Entrepreneurship at IIT Hyderabad, to think how they could provide a solution to doctors like Jagdishwar to monitor patients at critical junctures and ensure they receive timely help and his nursing staff to improve their efficiency and help them do their work better. For parents like the Rajesh's ones who can now sleep peacefully at night knowing that their baby is taken care of.

They witnessed how nurses and doctors do their best within the limited resources available to them, especially in neonatal care where they resort to visually monitoring the babies for any signs of distress. Both spent a lot of time in the hospitals in Telangana trying to understand the pain points of all the stakeholders including patients, doctors, and nurses involved in the healthcare system.

NemoCare Wellness aims to end all preventable neonatal and maternal deaths in the developing world by building innovative affordable, accessible, highly accurate monitoring solutions for the emerging markets. We use unobtrusive wireless wearable sensors and networks, analytical algorithms and big data as tools to provide continuous, high-resolution monitoring and preventive care for every patient in the hospital and at home - making sure that no stone is unturned to prevent any form of mortality and morbidity, especially at the bottom of the pyramid. We use design thinking principles to build life-saving technologies that will transform the way healthcare is delivered.

Globally, three million babies die in their first month of life every year, and 98% of these deaths occur in the developing world. In India, approximately 3.6 million premature babies are born every year and out of them, 40000 babies die. Premature babies are susceptible to a variety of life-threatening conditions such as apnea, hypothermia and respiratory distress – causing either death or some form of morbidity. Almost all of these deaths are preventable with timely treatment.

However, hospitals in the developing world are severely challenged by limited resources. They cannot afford the expensive equipment, which is usually bulky and unsuitable for continuous monitoring. Moreover, they have a high rate of false alarms; forcing nurses to visually monitor the babies. In low resource settings, where one nurse cares for about 40 babies, she will not be able to give equal attention to every baby. Most distress conditions often go unnoticed, causing irreversible injury to the newborn and sometimes even lead to death.

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If a child has to be monitored continuously, they have to be isolated and hooked to wires – which hinders breastfeeding and kangaroo mother care – which in turn hinders growth and recovery. Visual monitoring of so many babies leads to a drastic decrease in efficiency of nurses and doctors which is not a good state to be in when they have to attend to emergencies. Based on the same thought process we spent a good 10 months, working closely with all the stakeholders, designing and developing the prototype, partnering with key players for piloting our device, working with vendors and identifying manufacturing partners. Our flagship product -the Nemocare Raksha is an IoT enabled smart wearable on the baby's foot which monitors all key vital parameters noninvasively that will provide a comprehensive picture of the baby's health.

The data is then transmitted to the cloud, which can be accessed at a central monitor by which the nurse or doctor can continuously and remotely monitor all the babies through a single interface. The entire system along with Nemocare's proprietary deep learning algorithm works as an intelligent platform that will track the baby's health in the most accurate way possible and give only insightful notifications and alerts to healthcare workers to enable timely intervention when a distress condition is detected. This platform collects, stores, visualizes and analyses the data generated, enabling a paradigm shift in clinical diagnostics and preventive care through a data-driven approach. Inherently, the data is used in real-time to provide early warning scores and other predictive indicators and used offline to develop new predictive algorithms.

We have to encourage the doctors and caregivers to step out of the comfort zone of

traditional practices and explore methods that will make them more efficient at what they already do so well. By building cutting edge technology that is designed to be user-friendly, Intuitive and less skill-intensive, we will be able to achieve faster adoption rates. Such technology is born, when engineering and design work hand in hand. The co-founders are a multi-skilled technologist and an industrial designer respectively and they use design thinking practices to build cutting edge technology and make it really simple to use. They believe it as their secret sauce to disrupt neonatal and maternal care.

Nemocare sees the huge potential in the area as the market size for baby monitoring devices is USD 1.2 billion for India alone. The Asia-Pacific and Indian baby monitor market is growing at 11 percent CAGR – owing to the rise in the amount of disposable income and number of working parents. There are 120,000 Hospitals (private nursing homes and corporate Hospitals) and 1500 public health centres that cater to 25 million babies that are born every year. This makes a total addressable market of USD 5.1 billion. Nemocare's work is funded by global funding agencies like the Bill and Melinda Gates Foundation, BIRAC (Govt Of India initiative), Axilor Ventures and Department of Science and Technology.

While the primary customer segment is the domestic market, there is also a huge potential to grow into foreign markets including Asia, Africa, the Middle East, and Europe. The first priority outside of India will be African markets as the need exists there as well and also a perfect setting for a facility-based product like ours.

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We have also been part of prestigious global accelerator programs like GSBI-Miller Center for Social Entrepreneurship, Qualcomm Design in India Challenge and Mass Challenge, USANemocare was adjudged the winner of the Asia Hardware Battle 2019 and is recognized under Startup India Program and Niti Aayog initiatives. Nemocare was Listed in top 50 disruptive innovations in India 2019 by Yourstory.

We were recently featured on TechCrunch as 'Wearables to help newborns stay safe' during the global pandemic times when safety was everyone's highest priority.

<https://techcrunch.com/video/nemocare-wearables-to-help-newborns-stay-safe//>



Figure 3: Team Nemocare at an exhibition demonstrating the product and concept.

The company has patents filed globally and has a strong IP portfolio pipeline that will be its strength and key to market share capture. Currently, the company is doing scale-up pilot studies for evidence creation and regulatory clearances with two public hospitals and two private hospitals. We intend to explore the consumer market for other baby monitoring innovations. With Covid bringing in more awareness about healthcare and telemedicine becoming mainstream, we believe our product fits perfectly to ensure newborns get the much-needed attention they deserve during a global pandemic.

Hiring new talent to expand our team, seeking out mentorship, financial guidance and business plan development have all been a part of our roller coaster entrepreneurial journey, but we have been efficiently guided by our mentors at CfHE. The centre gave some good technical mentors and incubation space where we could start our operations. Our sincere gratitude to Prof Renu John (our Technical Advisor, HoD Biomedical Engineering and Head CfHE) for his constant support and guidance to give our best. We also take this opportunity to thank the director, Prof Mohan Raghavan, Dr Subha, Dr Aravind and the entire CfHE and IITH fraternity for handholding us through this roller coaster journey and giving us a strong foundation. CfHE has a curated curriculum that exposed us to best practices in IP, Regulatory, Product development, Corporate affairs, Clinical Immersion and Business aspects curated for first-generation MedTech entrepreneurs like us. We envision to save the lives of 1 million newborns and soon be a part of India, rather the world where no baby ever dies of a completely preventable cause.

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Figure 2: A baby with Nemocare 'Raksha' Device

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Figure 2: The working prototype of Nemocare 'Raksha'

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