

Executive Summary



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- 1. Title of the Project:** Large Scale Validation/Field Trial of an Indigenous Non-Invasive Non-Contact Robust Portable Hand-held Device for Accurate Measurement of Bilirubin Level, Hemoglobin Concentration and Oxygen Saturation in Neonatal Subject.
- 2. Date of Start of the Project:** 1st August, 2018
- 3. Aims and Objectives:**

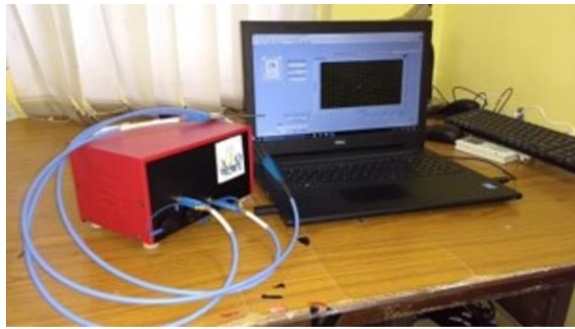
Objective 1: To clinically validate at large scale a simple, inexpensive, and non-invasive hand-held device that can measure bilirubin level, hemoglobin concentration, and oxygen saturation in neonates very quickly, without the need for the painful blood test.

Objective 2: Few non-invasive devices are available commercially but they are expensive. Our proposed device will reduce the cost to 50% of the current costs of measurement of oxygen saturation in critical patients.
- 4. Significant achievements:**
 1. For developing countries like us, the under-five mortality rate (U5MR) is a major challenge for the health sector. A decrease in U5MR is possible if one can rapidly diagnose jaundice, anemia and oxygen

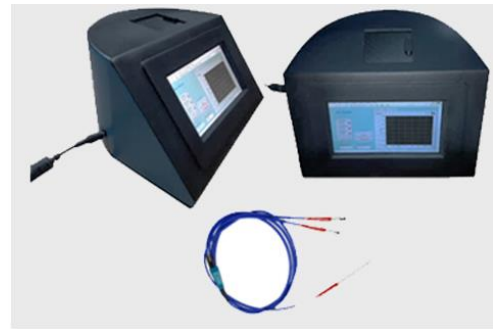
deficiency because these 3 diseases are responsible for a huge proportion of U5MR. This device can perform the diagnosis of the mentioned diseases within a few seconds without any requirement of blood. Not only the cost per test is much lower compared to the available one and data can be transferred to miles away just in few minutes, which provide a platform of e-diagnosis. So this device will help to improve our health care system and also to reduce the high U5MR in India.

The technology is beneficial for all the developing countries who have been battling against a high U5MR.

2. Non-contact, non-invasive device for estimation of hemoglobin, bilirubin and oxygen saturation level from nail bed of neonates has been developed.
3. The device has been miniaturized into a portable, easy to use instrument for detection of anemia, jaundice and hypoxia at point of care settings.
4. The device was tested on 4,318 neonates at neonatal intensive care unit (NICU), NRS Medical College & Hospital, Kolkata. The subjects included neonates suffering from anemia, hyperbilirubinemia, hypoxia and congenital heart disease.
5. The device provided accurate hemoglobin, bilirubin and oxygen saturation levels as analyzed using various statistical methods including simple linear regression analysis, Bland & Altman method of comparison
6. The proposed device can reduce the blood sampling of neonates by 24-36% thereby, increasing the socio-economic condition of the society.
7. One technology for non-invasive bilirubin detection in neonates has been commercialized (technology transferred). A total 6 technologies have been commercialized in the tenure of the project. The product are omnipresent in the market.
8. Publications: 95
Patents: 14
Technology transferred: 6
9. Manpower Trained:
Ph.D. Submitted:14
Ph.D. Ongoing: 11
Other Technical Personnel: 7



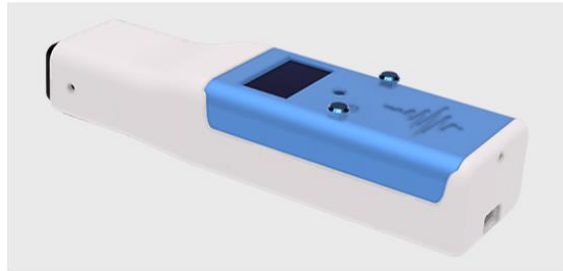
2019-2020



2020-2021

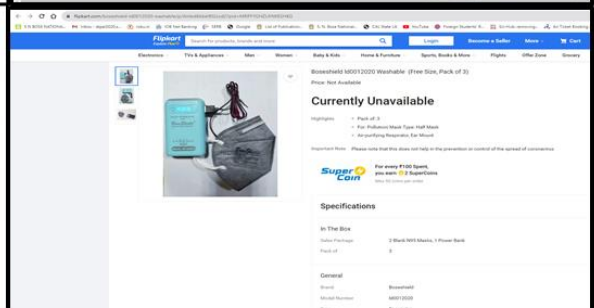


2021-2022



2022-2023

Evolution and miniaturization of AJO for non-invasive detection of anemia, jaundice and oxygen saturation from 2019-2023.



Products Omnipresent in the market



Demonstration and technology transfer of AJO including their advertisement in their website.

5. Concluding Remarks:

The device for non-invasive detection of anemia, jaundice and oxygen saturation has been transferred to Zyna Medtech Pvt. Ltd. and EzeRx commercialized and is available in the market. The device has reduced the blood sampling of neonates by 24-36% thereby, increasing the socio-economic condition of the society. Throughout the tenure total number of Publications, Patents and Technology transferred are 95, 14 and 6 respectively.


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Name and signature with date
(Award Recipient)