

The device, not seen in this photo, could minimize the amount of time jaundiced infants need to spend receiving phototherapy

According to Japan's Yokohama National University, jaundice occurs in 60 to 80 percent of all newborn babies, and can result in brain damage or even death if left unchecked. That's why they've developed a new wearable device to help in its treatment.

Jaundice is caused by an elevation of bloodstream levels of a compound known as bilirubin, which causes the skin to turn yellow. Treatment typically involves exposing the infant to blue light, which breaks the bilirubin down so it can be passed with the urine. That said, the process takes away from time in which the infant could be bonding with its mother, plus it can lead to dehydration and the development of allergies.

Currently, pediatricians periodically assess bilirubin levels in jaundiced babies via a handheld tool known appropriately enough as a bilirubinometer. Led by Assoc. Prof. Hiroki Ota, a team of Yokohama scientists set out to develop a device that performs the same task continuously.

The resulting battery-powered prototype gently adheres to an infant's forehead via a flexible silicone interface, then utilizes an integrated camera and LEDs to photograph their skin. Imagery is wirelessly transmitted to a paired smartphone, where an app analyzes the skin color in the photos to ascertain bilirubin levels in real time.

As an added bonus, the device also incorporates a pulse oximeter, to measure the baby's pulse rate and blood oxygen saturation.

So far the prototype has been tested on 50 infants, and was found to *not* be accurate enough for clinical diagnoses – in its current form, at least. That could likely change with subsequent improvements, however, one of which may involve tweaking the silicone interface for better skin contact.

"The real-time monitoring of jaundice is critical for neonatal care," says Ota. "Continuous measurements of bilirubin levels may contribute to the improvement of quality of phototherapy and patient outcome."

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A paper on the research has been published in the journal *Science Advances* .

Source: Yokohama National University via EurekAlert