

Bilirubin phone apps – our future calls! Bilirubin phone apps – our future calls!

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In a recently released article in *Pediatrics* (*REF*), Dr. James Taylor and colleagues describe a technology in which digital images, obtained with a new smartphone app, are used

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In a recently released article in *Pediatrics* (*10.1542/peds.2017-0918*), Dr. James Taylor and colleagues describe a technology in which digital images, obtained with a new smartphone app, are used to assess jaundice in healthy newborns. This fascinating app, called BiliCam, was tested on 530 infants with a range of skin tones: measurements correlated well with total serum bilirubin (TSB) obtained within a 2-hour window of the BiliCam reading. Reassuringly, the BiliCam had a sensitivity of 84.6%

sensitivity for identifying infants with a TSB in the high-risk zone of the Bhutani nomogram (Management of hyperbilirubinemia in the newborn infant 35 or more weeks of gestation. American Academy of Pediatrics Subcommittee on Hyperbilirubinemia. et al. *Pediatrics*. 2004), and a 100% sensitivity for identifying those with TSB \geq 17 mg/dL. Technology geeks and those with an interest in devices will enjoy reading technical details about the BiliCam. Briefly (for non-techies!), a calibration card is placed on the infant's sternum to standardize the color (and jaundice) reading in the photo; the image goes via the internet to a server for analysis.

Will this be the wave of the future for newborn care post hospital discharge? Will mothers and family members be able to send in images rather than needing to come to the hospital? Certainly we see babies shortly after postpartum hospital discharge for many reasons beyond "jaundice checks," and these include help for breastfeeding, monitoring adequacy of hydration and weight gain, and family support. But particularly for those infants who hover near their "light level" on the Bhutani nomogram and for whom extra

bilirubin measurements are required, repeated home visits from a nurse may not be covered by insurance and repeated trips back to the pediatrician's office are exhausting. In these situations, the use of a smart phone app to follow the infant's jaundice, and to help decide when a serum level is needed, could be highly advantageous. Needless to say, there are legal, HIPAA (Health Insurance Portability and Accountability Act), device approval and insurance issues to manage, but these are administrative hurdles that can be overcome. Studies have documented that publicly insured low-income parents are likely to have smartphones as their primary internet access point (Mitchell SJ et al *J Med Internet Res*, 2012; Demartini et al *Pediatr* 2013), with smartphone ownership rates of 71-97%, so this convenience would not be limited to middle and high income families alone.

Dr. Taylor and colleagues envision the BiliCam as having the potential to revolutionize bilirubin monitoring in low and middle income countries (LMIC), and this is an interesting and potentially very important possibility due to the heavy global health burden of kernicterus (Olusanya BO, et al. *BMC Pediatrics*. 2015). While sending images requires internet service, which may not be universally available, smartphones beat transcutaneous bilirubin meters for both cost and population density in LMICs. With the good correlation demonstrated in this study between TCB (transcutaneous bilirubin) measurements and the BiliCam, it may be that having a choice of method will be best. Congratulations to the authors for bringing new ideas and well done research to the study of noninvasive measurements of jaundice.

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