Contribution ID: **9** Type: **Poster Presentation**

Novel Eye Goggle Configuration Icterometer For Neonatal Jaundice Screening in Low Resource Settings

ABSTRACT
Neonatal jaundice, also known as neonatal hyperbilirubinemia, is a common condition among newborns in the first week after birth. Notable, it is a leading cause of death and disability for newborns in low-resource nations, including Southern Africa nations. Persistent challenges due to inadequate, inefficient or financially inaccessible diagnostic alternatives for its management in resource-constrained settings leads to ongoing and unacceptable rates of morbidity, disability and mortality. Therefore, a need exist for low-cost low-tech diagnostics means for neonatal jaundice screening in low resource settings. Here, we present preliminary result with a novel eye-goggle configuration icterometer for neonatal jaundice screening exploiting the yellow discoloration of the sclera, effectively avoiding the interference effects of melanin in skin color determination. For in-situ real-time visual assessment of the eye sclera color, the eye-google configuration icterometer integrates a color card. Verification of visual assessment is by image analysis involving processing the pixel colour values of the sclera to predict the total serum from the digital photographs of newborn infants'eyes. We envisage the screening tool will be useful in meeting the need to improve referrals from home, community or peripheral health centers to higher-level facilities with capacity for bilirubin testing and/or phototherapy.

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Primary author: JONATHAN, Enock

Co-authors: Ms MOKHETHI, Makarabo (National University of Lesotho); Ms RALETS'ELA, Nickiwe (National University of Lesotho)

Presenter: JONATHAN, Enock

Session Classification: Poster Session

Track Classification: Track F - Applied Physics