

# NUA Chest Circumference measuring tool for identification of Low Birth Weight newborns in Nigeria: a patented invention

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The NUA Chest Circumference measuring tool for identifying low birth weight newborns is an inelastic color-coded measuring tape. The acronym "NUA" was derived from the initials of the names of the inventors: N, Ndu, U, Uchenna, A, Asinobi. This invention relates to birth weight measurement, an indispensable tool for detecting at-risk newborns. This is especially true regarding Low Birth Weight (LBW), a significant contributor to infant mortality. The neonatal mortality rate in Nigeria remains one of the highest in the world, at 34.9 deaths per 1000 live births, according to the World Bank in 2021.<sup>1</sup> Therefore, identifying LBW infants using alternative low-cost technology and practical methods such as the NUA tape, which could be applied at the primary level of health care, will help address this problem. In resource-poor settings where weighing scales may be unavailable or poorly maintained, birth weights are not recorded, thus increasing the burden of neonatal mortality. Given this challenge, the World Health Organization (WHO) has recommended the use of anthropometric measurements, such as chest circumference, which have been shown to correlate significantly with birth weight.<sup>2</sup> Using validated chest circumference cut-off values,<sup>3</sup> the inventors designed the color-coded tape for use by midwives, traditional birth attendants, and other health workers to facilitate the detection and subsequent referral of LBW newborns in areas where weighing scales are unavailable. This color-coded tape is easy to use and is made from non-elastic, flexible fiberglass measuring tape, which is cheap and readily available. It requires minimal training. The color-coded NUA tape can easily identify three weight groups which will determine the next line of action in the management of newborns:

- i) Those weighing more than 2500g will fall within the green zone of the NUA tape. These are normal birth weight newborns that can be nursed at home
- ii) Those weighing 2000-2499g will fall within the yellow zone of

the NUA tape. These Low Birth Weight newborns are to be monitored closely at home for possible referral.

- iii) Those weighing less than 2000 will fall within the red zone of the NUA tape. These Low Birth Weight newborns are for immediate referral to an appropriate facility.

The inventors believe that the NUA TAPE is an ideal instrument for Low Birth Weight identification in paediatrics and neonatal medicine. Its utilization among health workers, particularly in rural communities, will contribute to the early identification of affected babies for prompt referral and can significantly reduce neonatal morbidity and deaths in Nigeria.

Registration of patent number: NG/P/2018/135

Date of patent: May 8, 2018

Date of sealing: September 3, 2018

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## References

1. UN Inter-agency Group for Child Mortality Estimation. Neonatal Mortality Rate. Available from: <https://childmortality.org/data/Nigeria>
2. World Health Organization (WHO). Use of a simple anthropometric measurement to predict birth weight. WHO Collaborative Study of Birth Weight Surrogates. *Bull World Health Organ* 1993;71:157-63.
3. Ndu IK, Ibeziako SN, Obidike EO, et al. Chest and occipito-frontal circumference measurements in the detection of low birth weight among Nigerian newborns of Igbo ethnicity. *Ital J Pediatr* 2014;40:1-8.