

COLUMBIA UNIVERSITY MEDICAL CENTER

## Comparison of Apgar score, skin-to-skin initiation time and resuscitative interventions between Black and non-Black neonates

Sandy Kim MD, James Conwell DO, Jean R Guglielminotti MD PhD, Ruth Landau MD



## Background & Hypothesis



- Black neonates have "falsely" lower Apgar scores due to darker skin pigmentation
  - Scores do not correlate to cord blood gas values<sup>1-3</sup>
  - Scores do not correlate to pulse oximetry values<sup>4,5</sup>
  - Population datasets show darker racial and ethnic groups are less likely to have high Apgar scores than white counterparts<sup>6,7</sup>
- We hypothesized that Black neonates have lower Appearance score and thus lower Apgar scores leading to:
  - Delayed skin-to-skin initiation
  - More resuscitative interventions
  - 1. Marx et al, Correlation of biochemical data with Apgar scores at birth and at one minute. Br J Anaesth 1977
  - 2. Yama et MarxRace and Apgar scores. Anaesthesia, 1991
  - 3. Edwards et al Associations between provider-assigned Apgar score and neonatal race. Am J Obstet Gynecol 2023
  - 4. Chauhan, Correlation of pulse oximetry and Apgar scoring in the normal newborns. J Clin Neonatol, 2013
  - 5. Dawson et al Assessing the tongue colour of newly born infants may help to predict the need for supplemental oxygen in the delivery room. Acta Paediatr
  - 6. Doyle et al Race/ethnicity, Apgar, and infant mortality. Population Research and Policy Review 2013
  - 7. Grunebaum et al Hidden in plain sight in the delivery room the Apgar score is biased. J Perinat Med 2023

## Study Design & Methods



- An observational cross-sectional study of neonates born via cesarean delivery between 11/2023 and 02/2024 at two centers
- Exposure of neonate race (Black vs non-Black)
- Primary outcome is Apgar score at 1 min
- Secondary outcomes are Apgar Score at 5 min, skin-to-skin initiation time, and resuscitative interventions
  - Resuscitative interventions included O2 blowby, positive pressure ventilation, intubation, NICU admission





Table 1. Neonatal outcomes by race and Apgar s	core		
	Black (n=25)	Non-Black (n=179)	P value
Apgar score at 1 minute			
≤7, n=3	2 6 (24%)	26 (14.5%)	0.419
8, n=9	9 12 (48%)	87 (48.6%)	
9, n=7	<b>3</b> 7 (28%)	66 (36.9%)	
Apgar score at 5 minutes			
≤7, n=	8 2 (8%)	6 (3.3%)	0.141
8, n=2	7 1 (4%)	26 (14.5%)	
9, n=16	9 22 (88%)	147 (82.1%)	
Outcomes			
Skin-to-skin time (min), n= 120	94.9 ± 33.9 (n=19)	74.8 ± 27 (n=101)	0.02
Resuscitative interventions (yes), n=204	7 (28%)	54 (30.2%)	1.0
Apgar Scores at 1 minute on skin-to-skin times and resuscitative interventions			
Apgar score	Skin-to-skin time (min) (p value of <b>0.002</b> )	Interventions	P value
≤7 <i>,</i> n=3	<b>2</b> 97.5 ± 38.7	25 (78%)	0.002
8, n=9	<b>9</b> 80.7 ± 29.8	28 (28%)	<0.001
9, n=7	<b>3</b> 68.8 ± 20.3	8 (11%)	<0.001

- No difference by neonate race in Apgar scores at 1 and 5 minutes
- Black neonates had delayed skin-to-skin initiation times
- Lower Apgar scores were associated with delayed skin-to-skin times and interventions

## **Conclusion & Discussion**



- Black neonates have significantly later skin-to-skin initiation times despite no differences in Apgar scoring
  - Possibly another form of implicit bias?
  - Small sample size of Black neonates precludes finding differences in categorical outcomes such as Apgar scores and resuscitative interventions
- Future studies evaluating modified Apgar score without appearance component and its effect on downstream outcomes such as skin-to-skin initiation times and resuscitative interventions is warranted