Maternal Involvement as a Predictor of Early Infant Conversational Turns In the Neonatal Intensive Care Unit (NICU)

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Background

- Preterm infants (PT) are at ↑ risk for speech & language delays.
- In the NICU, ↑ word count exposure is associated with improved 2 year language outcomes.
- Maternal involvement in infant care mediates more favorable infant behavior and developmental outcomes.
- Limited data on the relationship between maternal involvement and infant language outcomes.

Objective

To assess the association of maternal involvement with maternal adult word count (AWC), infant vocalization (CV) and parent-infant conversations turns (CT) in a cohort of mothers and their preterm infants during NICU hospitalization.

Hypothesis:

- Mothers who have increased presence and involvement in infant care during infant NICU stay will have higher adult word counts.
- Infants of mothers who have increased presence and involvement in infant care in the NICU will have higher vocalizations and conversation turns.

Methods

This is a sub-study of a larger study examining post-discharge language outcomes.

Retrospective chart review of a randomized controlled trial comparing a language intervention group with standard of care group (control) at WIH NICU from Jan. 2013 – Aug. 2016.

Study sample: Infants born 23-32 weeks gestational age and mothers residing in RI or MA.

Procedure: When infant was medically stable, mothers were approached, consented, and randomized to an **intervention group** (receive a language curriculum) vs **control group** (receive a health & safety curriculum).

Maternal involvement : Data collected on LENA recording days included hours of 1) visitation, 2) kangaroo care (skin to skin), 3) holding (traditional), 4) touching, 5) bedside care (temperature, diapering, bathing), 6) feeding involvement.

Language Environment Analysis digital language processor (LENA™): AWC, CV and CT were captured on recording #1 (32 weeks), recording #2 (34 weeks), and recording #3 (36 weeks) post menstrual age (PMA).

Outcomes: AWC, CV, CT.

Statistics: Mean, standard deviations, and % are shown for cohort. Groups were divided by # of maternal involvement types, 0, 1-2, 3-4, and 5-6. Negative binomial regression was used to estimate change in maternal involvement over time and the effect of # of involvements on LENA variables.

Results

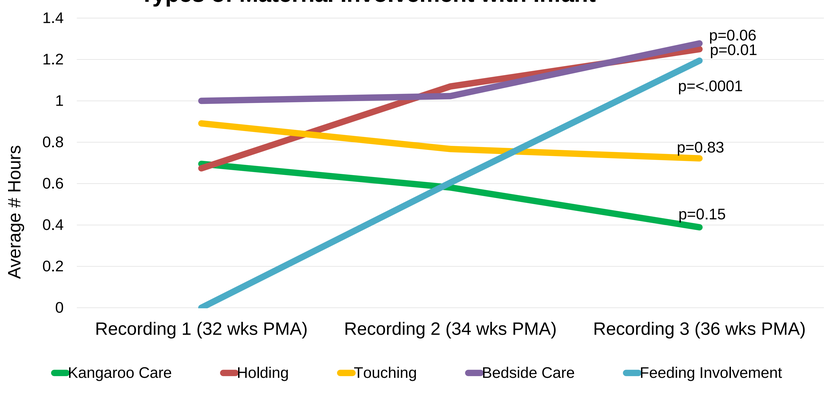
Results presented are for the control group- 41 mothers and their respective 47 infants.

Cohort Characteristics

Maternal (n= 41)	*n (%)*
Age (yr) *mean ± SD*	27.1 ± 6
Race	
White	24 (63)
Black	8 (21)
Other	6 (16)
English as first language	32 (80)
Para	
1	21 (51)
≥2	20 (48)
Marital status	
Married	17 (42)
Unmarried	11 (27)
Live together	13 (32)
Public insurance	23 (56)
Education	
< High school	3 (8)
High school	12 (37)
Partial college	10 (26)
≥ College	13 (34)
Prenatal care	40 (100)

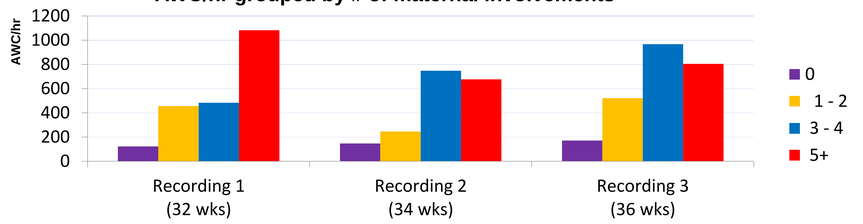
Infant (n=47)	*n (%)*
Birth weight (g) *mean ± SD*	1063 ± 346
Gestational age (weeks) *mean ± SD*	27.6 ± 2
Female	26 (55.3)
Intraventricular hemorrhage	1 (2)
Necrotizing enterocolitis	1 (2)
Bronchopulmonary dysplasia	21 (47)
Home on oxygen	6 (12.8)
Total days on oxygen *mean ± SD*	59.0 ± 43.1
Length of hospital stay (days) *mean ± SD*	81.0 ± 37.8
Home on breast milk	23 (49)

Types of Maternal Involvement with Infant

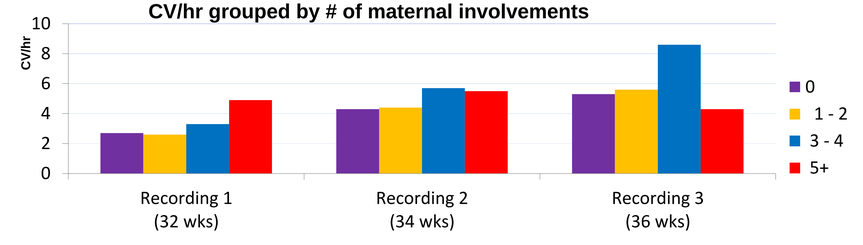


Results (con't)

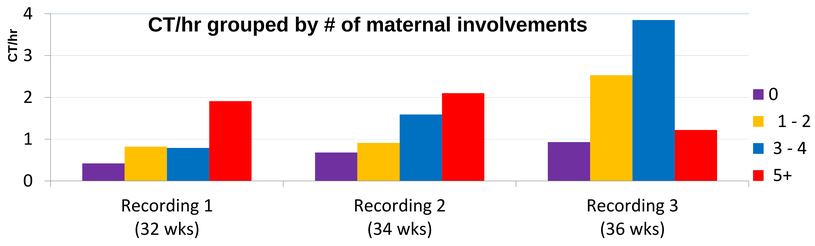
AWC/hr grouped by # of maternal involvements



CV/hr grouped by # of maternal involvements



CT/hr grouped by # of maternal involvements



Effects of ↑ # of maternal involvements on AW, CV & CT

	AWC	CV	CT
Rate Ratio	2.133	1.07	1.53
Confidence intervals	1.73-2.63	0.92-1.24	1.23-1.89
P value	**<.0001**	0.37	**.0002**

Results Summary

For every stepwise increase in maternal involvement with their infant in the NICU there was a

- 133 % increase in adult word count
- 7 % increase in child vocalizations
- 53 % increase in conversational turns

Conclusions

1. Increased maternal involvement in the NICU is not only associated with greater exposure to parent talk, but to increased mother-infant conversational turns prior to infant due date.
2. Mothers need to be informed that maximizing visiting and caring for their preterm infant provides opportunity to foster very early language development.