

# A Pacifier-Activated Music Player With Mother's Voice Improves Oral Feeding in Preterm Infants



**WHAT'S KNOWN ON THIS SUBJECT:** Preterm infants must develop oral feeding skills before successfully transitioning to home. Pacifier-activated devices playing selected music can improve nonnutritive sucking in preterm infants. A mother's voice is a positive auditory stimulus for infants.



**WHAT THIS STUDY ADDS:** A brief intervention with a pacifier-activated music player using mother's voice can decrease tube feeding duration without adverse effects on stress or growth. Operant conditioning with positive reinforcement is an effective developmental strategy to improve preterm infants' feeding skills.

## abstract



**OBJECTIVES:** We conducted a randomized trial to test the hypothesis that mother's voice played through a pacifier-activated music player (PAM) during nonnutritive sucking would improve the development of sucking ability and promote more effective oral feeding in preterm infants.

**METHODS:** Preterm infants between 34 0/7 and 35 6/7 weeks' postmenstrual age, including those with brain injury, who were taking at least half their feedings enterally and less than half orally, were randomly assigned to receive 5 daily 15-minute sessions of either PAM with mother's recorded voice or no PAM, along with routine nonnutritive sucking and maternal care in both groups. Assignment was masked to the clinical team.

**RESULTS:** Ninety-four infants (46 and 48 in the PAM intervention and control groups, respectively) completed the study. The intervention group had significantly increased oral feeding rate (2.0 vs 0.9 mL/min,  $P < .001$ ), oral volume intake (91.1 vs 48.1 mL/kg/d,  $P = .001$ ), oral feeds/day (6.5 vs 4.0,  $P < .001$ ), and faster time-to-full oral feedings (31 vs 38 d,  $P = .04$ ) compared with controls. Weight gain and cortisol levels during the 5-day protocol were not different between groups. Average hospital stays were 20% shorter in the PAM group, but the difference was not significant ( $P = .07$ ).

**CONCLUSIONS:** A PAM using mother's voice improves oral feeding skills in preterm infants without adverse effects on hormonal stress or growth. *Pediatrics* 2014;133:462–468

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### KEY WORDS

nonnutritive sucking, feeding, length of hospitalization, music therapy, maternal voice, operant conditioning

### ABBREVIATIONS

GA—gestational age  
GEE—generalized estimating equation  
IRB—institutional review board  
IVH—intraventricular hemorrhage  
NNS—nonnutritive sucking  
PAL—pacifier-activated lullaby  
PAM—pacifier-activated music player  
PVL—periventricular leukomalacia

Dr Maitre designed the study, obtained grant funding, carried out preliminary analyses, and reviewed and revised all drafts of the manuscript; Ms Chorna designed the study, recruited participants, performed the PAL intervention and participated in data collection and entry, and drafted the initial manuscript; Ms Wang participated in data collection and entry and drafting of the initial manuscript; Dr Slaughter designed the final statistical analyses; Dr Stark contributed to study interpretation and reviewed and revised all drafts of the manuscript; and all authors approved the final manuscript as submitted.

This trial has been registered at [www.clinicaltrials.gov](http://www.clinicaltrials.gov) (identifier NCT01600586).

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