

## Exploring The Science of Nurture

### *CUMC Researchers Bolster Mother-Child Emotional Connection in the NICU*

The emotional connection between a mother and her infant is normally present at birth, and vocal soothing, touching, comforting, holding, and making eye contact—behaviors commonly associated with “nurture”—have a profound impact on development and behavior. Studies have shown that they can help a child become more resilient to a broad range of mental, behavioral, and physical disorders, and that they play a role in the mother’s wellbeing, too.

For the past several years CUMC’s Nurture Science Program, a team of basic, translational, and clinical scientists under the direction of Martha G. Welch, MD, Associate Professor of Psychiatry in Pediatrics and Pathology & Cell Biology and Michael M. Myers, PhD, Professor of Clinical Behavioral Biology in Psychiatry and Pediatrics and Research Chief, Developmental Neuroscience, has been combining insights from cell biology and neurobiology and behavioral physiology to explore the scientific underpinnings of nurture.

Preterm infants are separated from their mothers for life-saving care just when a mother and infant’s calming physical interactions ensure an emotional connection and inoculate both against stress. Thus, preterm infants are at a higher risk of developing emotional, behavioral, and developmental disorders. The Nurture Science team has been conducting randomized controlled trials of Family Nurture Intervention (FNI), a multi-generational prevention model in the very first days of infants’ lives in the neonatal intensive care unit (NICU) at New York Presbyterian/Morgan Stanley Children’s Hospital.

The primary goal of FNI is to establish an emotional connection between mother and infant. Through repeated calming sessions, a nurture specialist facilitates the emotional connection through various mutual activities that include emotional expression, exchange of scent cloths, vocal soothing, comforting touch, eye contact, clothed and skin-to-skin holding and cuddling. As the two establish a Calming Cycle routine they become mutually attuned to one another’s emotional, physiological, and behavioral cues and needs. This in turn bolsters the mother’s confidence in the viability of her infant and increases her motivation to care for her infant.



MOTHER AND INFANT ESTABLISH AN EMOTIONAL CONNECTION THROUGH TOUCHING AND HOLDING.

Other family members including the father and grandparents are also encouraged to do calming sessions whenever possible. “We believe that parents can be helped to create and sustain optimal nurturing interactions and family connectedness that can prevent and even overcome emotional, behavioral and developmental problems,” says Dr. Welch.

Since 2012 the researchers have published eight publications reporting results of the FNI NICU study. Significant among their findings:

- When they reached full-term age, preterm babies who had received FNI showed robust increases in brain activity (as much as 36% in the frontal polar region by electroencephalographic power) compared to babies in the standard care control group.
- Mothers of preterm infants are at high risk of postpartum depression (between 28 and 70%). Mothers in the intervention group showed enhanced maternal care giving behavior while in the NICU and lower levels of anxiety and depressive symptoms four months after their infants were discharged.
- At 18 months, FNI infants had better

cognition, language, attention, as well as decreased risk for autism. These findings are highly noteworthy because other researchers have reported that preterm infants have deficits related to frontal polar function, and that infants with greater power in this region have improved neurodevelopment, and ability to regulate and manage emotions at older ages.

The research team has showed that a small dose (about six hours per week) of Family Nurture Intervention can lead to relatively large effects that are sustained throughout the critical 18-month period after discharge from the NICU. Their findings show that the negative effects of the stress and trauma of preterm birth are not necessarily permanent.

Current research studies include testing a model of FNI for preschool children and their mothers. Pilot data suggests that FNI is effective in this age group. According to Dr. Welch, “Our research holds the promise that infants and mothers can benefit from early intervention, and additionally that mother/child pairs who are having problems later in development may also benefit from these new treatments.”