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MCH Innovations Database Practice Summary & Implementation Guidance

Family Connects

The Family Connects model is an evidence-based and successfully demonstrated program that connects parents of newborns to the community resources they need through postpartum nurse home visits.



Location

Durham, NC



Topic Area

Access to Health Care/Insurance; Primary/Preventative Care; Health Equity; Health Screening/Promotion; Mental Health/Substance Use; Injury Prevention/Hospitalization; Preconception/Reproductive Health; Service Coordination/Integration



Setting

Home-based



Population Focus

Perinatal/Infant Health; Women's/Maternal Health; Families/Consumers; Health Care Providers



NPM

NPM 5: Safe Sleep; NPM 7: Injury Hospitalization; NPM 11: Medical Home



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Section 1: Practice Summary

PRACTICE DESCRIPTION

The Family Connects model, first known as Durham Connects, was developed as a partnership between Duke University, Durham County government, and the Center for Child and Family Health, a community nonprofit, with the goal of reducing child maltreatment in Durham, North Carolina. Studies have shown the model to yield impressive results, including fewer child emergency department visits, reduced maternal anxiety and depression, and fewer incidents of child maltreatment investigations. To expand the reach of this work beyond Durham County, Duke University created Family Connects International (FCI) in 2017.

The Family Connects model is available free-of-charge to every family with a newborn in a participating community or service area. Families are typically engaged and recruited in birthing hospitals. All families that schedule a visit receive one to three home visits from a registered nurse. At the home visits, nurses work with the family to assess the health of the caregiver and infant, discuss supportive guidance, and provide comprehensive connections to community resources that support the long-term well-being of the entire family. By reaching all families through a framework of targeted universalism, Family Connects improves health and well-being at the population level.

FCI partners with local and state governments, health-care systems, and nonprofits to plan and implement the Family Connects model, providing full support for successful implementation. FCI trains registered nurses to build trust, offer supportive guidance, and navigate difficult situations. FCI also provides the assessments, screening tools, and a robust data system that nurses use to document clinical encounters and link families to the specific community services they need, including a medical home, mental-health services, child care, WIC, affordable housing, lactation support, parenting groups, and longer-term home visiting programs.

FCI trains and supports local and state leaders who have responsibility for implementing the model. FCI helps them to plan effectively for family and community impact, maintain model fidelity, and ensure fiscal sustainability. In addition, FCI engages with policymakers to inform them of the positive impacts of Family Connects on families, communities, and the health-care system, including cost savings. FCI also maintains a commitment to ongoing research and rigorous evaluation for continuous quality improvement, innovation of the model, and advancements in the field of early childhood health and development at the population level.

CORE COMPONENTS & PRACTICE ACTIVITIES

Family Connects used several theories of public health and prevention science in its development, including a Preventive System of Care framework (Dodge et al., 2004), the Social-Ecological Model of Child Maltreatment (Belsky, 1980; CDC, 2000), and the RE-AIM Framework (RE-AIM, 2000).



- A Preventive System of Care (PSoC) framework emphasizes supporting children and families through the creation of comprehensive spectrum of necessary services and supports organized into a coordinated network to meet the diverse and changing needs of children, youth, and families.
- The Social-Ecological model of child maltreatment is a framework for prevention that examines individual, relationship, community, and societal factors that contribute to risk for child maltreatment, as well as how each factor influences the others.
- RE-AIM is a framework for determining public health impact and translating research into practice. The five steps of the RE-AIM framework are reach, effectiveness, adoption, implementation, and maintenance. Practitioners examine each of these factors to ensure the efficacy of the program in achieving public health goals and population impact (RE-AIM, 2020).
- Family Connects also used feedback from families and the community to develop its model. A neighborhood survey provided family feedback about struggles they were facing, a series of neighborhood parent advocacy groups provided information about strengths and areas of concern in different neighborhoods, and a series of System of Care Breakfast Club discussions provided background on gaps in the existing system of care and the navigability of organizations providing community services.

The goal of our program is to support newborns and their families by linking parents to the individual community resources they need, ultimately improving health outcomes at the population level. The core components of this program include program availability to all families with newborns residing within a defined service area, a comprehensive in-home visit conducted by a registered nurse, assessment of family need using the Family Connects Family Support Matrix, short-term intervention or referrals to community resources when family needs are identified, alignment of community services with identified vulnerabilities and family needs, and documentation of all family encounters through an integrated data system.

Core Components & Practice Activities

Core Component	Activities	Operational Details
Universal Reach	Program offered to all families in a defined service area	Family Connects is available to all families with newborns residing within a defined service area. Visits are voluntary and newborns' primary caregivers are offered a Family Connects visit shortly after the baby's birth. Offering visits to all families reduces the stigma of program participation.



Integrated Home Visit	Registered nurses conduct comprehensive in-home visits	One to three visits are conducted by a registered nurse approximately three weeks after birth.
Assessment	Nurses work with families to assess need	The nurse and family participate in a systematic assessment of the family's strengths, risks, and needs using the Family Connects Family Support Matrix.
Connection	Short-term intervention or referrals to community resources	When family needs are identified, the nurse offers supportive guidance or connects families with the additional community resources and services that meet their individual needs.
Community Alignment	Identification and alignment of community services	Community services are identified and aligned through the creation of an electronic directory of agencies serving families of infants and young children (Agency Finder) and the creation and maintenance of a community advisory board.
Data & Monitoring	Documentation within an integrated data system	The nurse documents the visit, including physical assessments and community referrals, in an integrated data system and relays the appropriate information to the family's health care providers.

HEALTH EQUITY

Family Connects addresses health inequities at a systems level through both its community alignment process and its approach to risk assessment. Every site implementing Family Connects goes through a community alignment process. The Community Alignment Specialist facilitates local site establishment of a Community Advisory Board made up of relevant stakeholders. This board engages service providers in the community to map assets and resources, creates a directory of all services available to families, and actively participates in a feedback loop with the community to match family needs and community resources. This allows for the identification of gaps in the community's ability to serve all its families, providing opportunities to close those gaps and improve service availability and delivery. Closing these gaps helps address health disparities within a community. Qualitative



feedback from sites demonstrates changes that have taken place in communities through the community alignment process. For example, in one community, nurses heard from parents that they were unable to get to their medical appointments on existing bus routes. The Community Advisory Board went to policymakers, who were then able to change the bus routes to better serve families. In another community, families were not able to take their infants to well-child visits due to a lack of car seats. A foundation representative on the advisory board provided a grant to a community agency to provide car seats families with lower incomes.

Family Connects' approach to risk assessment also effectively addresses inequities. While Family Connects is a universal program, it is not one size fits all. Nurses take an approach to risk assessment that tailors the intervention to families' specific needs and preferences. After risk is assessed, the nurse and family decide together which referrals would be most beneficial. The nurse then follows up to make sure that a successful connection was made between the family and community resource. By providing individualized care and interventions to each family, Family Connects ensures that each family receives the unique services and resources they need. The process of determining interventions alongside the families also ensures that guidance and community connections are rooted in cultural humility. For example, nurses provide supportive guidance around safe sleep techniques. However, they can tailor that messaging to meet family need. Nurses are able to understand and navigate cultural differences, meet families where they are, and provide care that families find appropriate.

Our first RCT demonstrated the impact of Family Connects on health inequities. Utilization of emergency medical care through infant age 12 months was examined for a variety of subgroups. While positive intervention impacts were found for every subgroup, stronger effects were found for infants with Medicaid or no health insurance as opposed to private insurance. The finding that emergency medical care utilization was lower across all families is a strong indicator of system-wide change, while the larger effects observed for infants from families with lower incomes demonstrates Family Connects' effectiveness at addressing existing health inequities and reducing disparities. Analysis of white and black families found that Family Connects reduced disparities between white and black families in maternal anxiety at infant age 6 months and child maltreatment investigations at child age 5 years.

EVIDENCE OF EFFECTIVENESS

Two randomized clinical trials (RCTs) and a field trial have found positive impacts of Family Connects. The first RCT was conducted in Durham County, NC and included all 4,777 resident births between July 2009 and December 2010. In order to include families of all resident county births ethically and without exclusion, families were randomized a priori by infant birth date. Families of babies born on even dates were assigned to receive the intervention and those born on odd dates were assigned to be controls. For a subset of families, interviews and in-home observations were completed when the infant was about six months old. A randomly selected, representative sample of intervention and



control families were recruited for data collection and administrative records were retrieved from emergency departments and Child Protective Services. Families participating in the impact evaluation study were recruited without consideration for Family Connects participation status. All analyses utilized a two-tailed, intent-to-treat design. Extensive baseline sample comparisons were made to establish sample equivalence between groups, and all impact analyses were covariate adjusted to account for other possible explanatory factors (Dodge et al, 2013; Dodge et al, 2014; Goodman et al., 2021).

The second RCT was conducted in Durham County with all resident county births at one birthing hospital from January through June 2014. In order to include families of all resident county births ethically and without exclusion, families were again randomized a priori by infant birth date. To account for the unlikely possibility that even/odd birth date is associated with child well-being, group assignments were reversed for this trial. Families giving birth on an odd date were assigned to the intervention and those giving birth on an even date were assigned as controls. Interviewers completed outcome assessments with a subsample when the children were four to eight months old (Dodge et al, 2019). Consistent with the first RCT, families participating in the impact evaluation study were recruited without consideration for Family Connects participation status. All analyses utilized a two-tailed, intent-to-treat design. Extensive baseline sample comparisons were made to establish sample equivalence between groups, and all impact analyses were covariate adjusted to account for other possible explanatory factors (Dodge et al., 2019).

Because both RCTs were conducted in Durham, NC, a small urban community with a broad array of available community resources, a field trial was conducted in four low-income, rural counties in eastern North Carolina to evaluate impact when Family Connects was implemented in communities characterized by few resources and chronic rural poverty. We used a natural comparison design to evaluate outcomes for families of infants born from February through July 2014 (before Family Connects implementation) with outcomes for families of infants born during implementation from September 2014 to December 2015. All intervention group families were recruited without regard for their participation status. All analyses utilized a two-tailed, intent-to-treat design. Extensive baseline sample comparisons were made to establish sample equivalence between groups, and all impact analyses were covariate adjusted to account for other possible explanatory factors (Goodman, Christopoulos & Quinn, 2016).

We accounted for pretreatment differences and other child and family characteristics that might explain observed group differences by conducting ordinary least-squares multivariate regression analyses predicting outcomes from random assignment to intervention. Regression models estimated the impact of treatment eligibility on a variety of outcomes. All models included infant medical risk at birth, infant age at time of interview, infant gender, Medicaid insurance status at birth, family race/ethnicity, and parent marital status as covariates.

See Table 1: Evaluation Data in Appendix for Data Outcomes.



Section 2: Implementation Guidance

STAKEHOLDER EMPOWERMENT & COLLABORATION

Stakeholder Empowerment and Collaboration		
Stakeholder	How are they involved in decision-making throughout practice processes?	Does this stakeholder have lived experience/come from a community impacted by the practice?
Families	Parent focus groups were convened during the development of the Family Connects model to offer parents an opportunity to provide input and offer feedback on specific elements of the model. Families continue to participate in decision making through the Community Advisory Boards. Additionally, every family participating in Family Connects is contacted four weeks after case closure and asked to provide feedback on their experience. This process helps ensure the program remains parent-centric throughout the implementation process in a local community. On average, 99 percent of families report feeling satisfied with their Family Connects visit.	Yes
Community Leaders	Community leaders, community agency directors, health systems, and other key stakeholders are engaged through participation in a site-specific Community Advisory Board, providing an ongoing, bidirectional feedback loop between Family Connects and the community. A Family Connects Community Alignment Specialist also participates in a variety of local taskforces related to early childhood, mental health, and public health to collaborate with local	Yes



	<p>initiatives related to Family Connects' work. This process is critical for securing community buy-in and for ensuring that Family Connects integrates within the existing community system of care, supporting and enhancing existing systems rather than competing with or attempting replace those services.</p>	
<p>Community Agencies</p>	<p>The administrative home for every Family Connects program site is a local community agency (health department, health system, or nonprofit) viewed by that community as a trusted and respected partner in serving families. These partnerships ensure that Family Connects staff are embedded within an agency that understands local community resources and needs, and that is well-positioned to facilitate the community partnerships needed to develop and maintain a community-wide system of care.</p>	<p>Yes</p>

Stakeholders are able to participate in Family Connects through a variety of means, including:

- Home Visits** – families are directly engaged through being offered and receiving nurse home visits. All participating families are contacted at four weeks after completing the program and asked to report on outcomes of any community referrals received (including why they have not yet received services if a connection was not made) and their satisfaction with the program. Feedback is reviewed regularly by program staff and quality improvement plans are developed and implemented as needed to address identified concerns.
- Community Advisory Board** – all sites are required to convene or co-lead a Community Advisory Board comprised of community leaders, community agency directors, health systems, and other key stakeholders. This board, which must meet at least quarterly, allows stakeholders to participate in the process of aligning services to community need and providing direct feedback to the Family Connects program. Program data is also shared in this forum, tracking family needs, family referrals, and community service capacity to identify potential gaps between family need and service availability. As gaps are identified, members of the board can collaboratively discuss steps to address these gaps.
- Nurse Case Conference** – all sites are required to have a weekly case conference, where all program nurses meet to review open cases, discuss challenges, and develop collaborative solutions. Nurses also have the opportunity to share trends in referrals with each other and with the Community Alignment Specialist, who can then raise any larger issues with the Community Advisory Board and program leadership.



- **Technical Assistance Meetings** - all Family Connects sites participate in ongoing technical assistance meetings with Family Connects International. These meetings provide a forum for all sites to provide feedback to FCI. When needs or questions are site-specific, FCI can collaborate in the development of local solutions. When identified needs may be applicable to multiple sites (e.g., the development of a new protocol to support virtual home visiting during COVID), FCI can support the development of solutions that benefit all sites.

REPLICATION

The first RCT of Family Connects was conducted in Durham, NC in 2009. A second RCT was conducted in 2014 in the same community using a separate population of families to determine if the results could be replicated. The study found similar levels of program penetration, program quality, family satisfaction, and connection to community resources as in the first trial. The second trial also replicated the positive impacts on infants. The study found a positive impact on lowering rates of child maltreatment, by 44 percent, and on reducing infant emergency department visits and hospital overnights.

Because both RCTs were conducted in the same community, a separate evaluation was conducted in eastern North Carolina in 2014 to evaluate impact in four rural, low-income communities. Findings support that Family Connects can be successfully disseminated to communities outside of Durham with positive results. Population reach, program quality, family satisfaction, and connection to community resources remained high. Further, findings indicated once again that FC reduced infant utilization of emergency medical care. The program was also associated with increased father involvement, reductions in maternal overnight hospitalizations, greater maternal social support, and a greater percentage of caregivers using “back to sleep” techniques for the safety of their infants.

In each of these replications, there was a strong emphasis on adherence to the evidence-based intervention. All core components of the model were maintained, and strategies were discussed with intervention sites to overcome any possible barriers to adherence and fidelity.

INTERNAL CAPACITY

Family Connects International (FCI), the national office overseeing dissemination of the Family Connects model, currently comprises a team of approximately 30 members. This team includes public-health professionals, research scientists, data analysts, health care providers, and policy analysts. The FCI team brings together policy engagement, innovative research, and dissemination expertise to assist local and state governments, healthcare systems, and nonprofit organizations successfully implement the Family Connects model in communities across the country.

The standard staffing structure for local sites implementing FC includes:

- **Medical Director** – The Medical Director oversees the clinical protocol for each site, reviews and approves health assessments, and provides clinical decision-making support for nurses.



- Nursing Supervisor – A Nursing Supervisor provides clinical consultation, scheduling oversight, review of individual nurse needs for continuing education, and individual feedback using a reflective supervision model.
- Nurse Home Visitors – Registered nurses provide health and psychosocial assessments of newborn, caregiver, and family at the integrated home visit, approximately three weeks after birth.
- Community Alignment Specialist – The Community Alignment Specialist engages in activities to align community resources, including attending weekly nurse case conferences and community collaborations, identifying community services and systems that can serve as referral resources, and reviewing data to ensure effective utilization of available resources.

Sites may also employ Program Support Specialists to assist with scheduling and follow-up and data analysts to support with monitoring and reporting.

PRACTICE TIMELINE

Family Connects International utilizes multiple reinforcing strategies to build community capacity to implement FC through one-on-one consultations, trainings, and organized, virtually supported cohorts. In the cohort approach, sites are grouped together within the four phases of site development and receive phase-specific resources to work through milestones and deliverables and share lessons learned to meet site-level certification requirements. They move through these four phases alongside other communities and with support from FCI staff. The four phases of implementation are Planning, Installation, Implementation, and Certification Maintenance. For more information on this practice's timeline and specific practice activities, please contact Family Connects International at familyconnects@duke.edu.

PRACTICE COST

Family Connects practice costs vary by site. In the RCT evaluations of Family Connects conducted in Durham, NC in 2009-2010 and 2014, the total cost of the program has averaged between \$500 and \$700 per infant birth in the community. There are a number of factors that influence program costs including size of the program, administrative structures, cost of living, and salary and fringe rates. In terms of cost savings, the FCI team found that for each \$1 in program costs, the FC program in Durham yielded \$3.17 in savings in infant emergency health care costs alone. For more information on practice startup costs and budgets, please contact Family Connects International at familyconnects@duke.edu.

LESSONS LEARNED



Family Connects was developed and evaluated in Durham, North Carolina, a small urban community with high socioeconomic diversity and predominantly White, Black and Latinx populations. As Family Connects is implemented in different community contexts, such as rural communities, large urban centers, and statewide contexts, the FCI team has had to adapt its model to suit those unique local needs.

Additionally, because both RCTs were conducted in Durham, the extent to which similar outcomes would be observed in different cultural or community contexts is currently unclear. Further, because the impact evaluation samples in both RCTs were modest in size, we had limited statistical power with which to conduct subgroup analyses. The majority of our subgroup analyses thus far have focused on comparing white families with families from all other racial and ethnic groups and comparing families utilizing Medicaid or no health insurance with those utilizing private insurance. Work is currently underway to focus more explicitly on the extent to which Family Connects impacts disparities between racial, ethnic, and socioeconomic groups.

NEXT STEPS

Additional sites across the county continue to implement the Family Connects model, with support from Family Connects International.

RESOURCES PROVIDED

The following manuscripts detail the implementation and impact evaluations of Family Connects to date:

- Alonso-Marsden S, Dodge KA, O'Donnell KJ, Murphy RA, Sato JM, Christopoulos C. Family risk as a predictor of initial engagement and follow-through in a universal nurse home visiting program to prevent child maltreatment. *Child Abuse Negl.* 2013;37(8):555-565. <https://doi.org/10.1016/j.chiabu.2013.03.012>.
- Dodge KA, Goodman, WB. Universal reach at birth: Family Connects. *Future of Children.* 2019;29(1):41-60. <https://doi.org/10.1353/foc.2019.0003>.
- Dodge KA, Goodman WB, Bai Y, O'Donnell K, Murphy RA. Effect of a community agency-administered nurse home visitation program on program use and maternal and infant health outcomes: A randomized clinical trial. *JAMA Netw Open.* 2019;2(11):e1914522. <https://doi.org/10.1001/jamanetworkopen.2019.14522>.
- Dodge KA, Goodman WB, Murphy RA, O'Donnell K, Sato J, Guptill S. Implementation and randomized controlled trial evaluation of universal postnatal nurse home visiting. *Am J Public Health.* 2014 Feb;104(Suppl 1):S136-43. <https://doi.org/10.2105/AJPH.2013.301361>.



- Dodge KA, Goodman WB, Murphy RA, O'Donnell K, Sato. Randomized controlled trial of universal postnatal nurse home visiting: Impact on emergency care. *Pediatrics*. 2013; 132(Suppl 2):S140-46. <https://doi.org/10.1542/peds.2013-1021M>.
- Goodman WB, Dodge KA, Bai Y, O'Donnell KJ, Murphy RA. Randomized controlled trial of Family Connects: Effects on child emergency medical care from birth to 24 months. *Dev Psychopathol*. 2019; 31(5):1863-1872. <https://doi.org/10.1017/S0954579419000889>.
- Goodman WB, Dodge KA, Bai Y, Murphy RA, O'Donnell KJ. Effect of a universal postpartum nurse home visiting program on child maltreatment and emergency medical care at 5 years of age. *JAMA Netw Open*. 2021; 4(7):e2116024. <https://doi.org/10.1001/jamanetworkopen.2021.16024>
- Goodman WB, Christopoulos C, Quinn J. Evaluation of the Family Connects program in the North Carolina Early Learning Transformation Zone: Final report. 2016; Durham, NC: Duke University. <http://hdl.handle.net/10161/15887>

APPENDIX

- **Table 1: Evaluation Data**

Connectedness	In all three studies, intervention parents reported more connections to community services and resources than control parents at infant age 6 months (RCT I: 16 percent more, RCT II: 17 percent more; Field Trial: 10 percent more).
Parenting and Home Environment	In the first RCT, intervention parents reported more positive parenting behaviors with their infants than did control parents. Interviews blinded to intervention participation status also rated intervention families as having higher quality home environments at infant age 6 months. In the first RCT and field trial, intervention mothers reported a higher-quality father-infant relationship compared to control mothers.
Parent Mental Health	In both RCTs, screenings indicated that intervention birthing parents were less likely than control birthing parents to exhibit signs and symptoms consistent with postpartum clinical anxiety (RCT I: 28 percent less, RCT II: 20 percent less), and in the field trial birthing parents reported 18 percent lower levels of symptoms consistent with postpartum clinical depression.
Infant Health and Well-Being	In the first RCT and field trial, intervention parents reported fewer instances of emergency medical care utilization for their infants (RCT I: 35 percent fewer, Field Trial: 25 percent fewer). In the first RCT, hospital records also indicate that intervention infants had 59 percent fewer emergency medical episodes between birth to age six months 37



	<p>percent fewer emergency medical episodes between birth to age 24 months. Intervention families also had a 39 percent reduction in the rate of investigations for suspected child abuse or neglect through age 5 years. In the second RCT, intervention families had a 34 percent reduction in the rate of investigations for suspected child abuse or neglect between birth and age 24 months.</p>
Subgroup Differences	<p>The first RCT examined emergency medical care episodes through age 12 months for a variety of subgroups and found positive intervention impacts for every subgroup. However, stronger intervention effects were found for infants with one or more medical risks at births as opposed to infants with no medical risks at birth and for infants with Medicaid or no health insurance as opposed to private insurance. Analysis of white and black families at infant age 6 months found that Family Connects is effective in increasing community connections and decreasing anxiety symptoms for both black and white families. Family Connects participation is also associated with a decrease in maltreatment investigations for black families, meaningfully closing the disparity gap between black and white families.</p>

