

Journal of ZERO TO THREE: National Center for Infants, Toddlers, and Families



# Early Brain and Child Development

Rethinking Well-Child Care

A Call to Action for the Family-Centered Medical Home

Promoting School Readiness Through Pediatric Primary Care

Supporting Quality in Early Care and Education

Developed in collaboration with the American Academy of Pediatrics

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### THIS ISSUE AND WHY IT MATTERS

ERO TO THREE is delighted to collaborate with the American Academy of Pediatrics (AAP) for this issue of the Journal, one that explores the emerging science of early brain development and opportunities for health care providers, early education professionals, parents, and communities to collectively promote early social and emotional development. During a child's first 1,000 days of life, a nurturing, responsive relationship between the child and engaged, invested caregivers positively influences the child's physical, social, and emotional health across the lifespan.

Recognizing that toxic stress and early childhood adversity have lifelong impacts upon the architecture of the brain, the functioning of the genome, and the growing disparities in health and learning, the AAP released both a Policy Statement and a Technical Report on toxic stress in January 2012. The Technical Report, *The Lifelong Effects of Early Childhood Adversity and Toxic Stress*, summarized the emerging neuroscience and epigenetics, whereas the Policy Statement, *Early Childhood Adversity, Toxic Stress, and the Role of the Pediatrician: Translating Developmental Science Into Lifelong Health*, challenged the entire pediatric community to take a leadership role in catalyzing fundamental change in early childhood policies and practices. The goal of these documents is to leverage emerging science to inform the development of innovative strategies to reduce the precipitants of toxic stress in young children and to mitigate the negative effects of toxic stress on the course of development and health across the lifespan.

Early social and environmental experiences (the ecology) and the genetic predispositions (the biology) influence the development of adaptive behaviors, learning capacities, lifelong physical and mental health, and future economic productivity. Brain development is integrated; the areas underlying social, emotional, and learning skills are inextricably connected and rely upon each other. Toxic stress disrupts the developing brain, alters genomic functioning, and has lifelong effects on learning, behavior, and health. Conversely, positive parenting and nurturing foundational social, emotional, and language skills as they emerge buffers toxic stress and builds resilience by promoting healthy, adaptive coping skills. Creating the right conditions in early childhood is more effective and far less costly than addressing a multitude of problems later on in life.

Health care providers are an important—but often overlooked—link in the network of community supports for young children and their families. Parents frequently turn initially to their pediatrician for advice on topics such as eating or sleeping issues, anxiety, aggression, or social problems. While these behavioral concerns are common and often reflect typical developmental processes, they may also manifest family dysfunction and an environment that is precipitating toxic stress. A time-honored component of any well-child check is developmental surveillance and the ongoing process of eliciting, documenting, and attending to parent concerns. Health care providers who work in concert with community agencies, such as child care providers, preschools, and social service programs, have the greatest potential to positively impact children's social and emotional health through comprehensive, coordinated care.

The articles in this issue underscore the importance of relationships between parents and children, service providers and families, and community supports and services—and the powerful impact that service providers can have when they arm families with the resources needed to support children's social–emotional well-being. In the first 1,000 days, it's all about how relationships build their brains…and our society's future.

Stefanie Powers, Editor



National Center for Infants, Toddlers, and Families

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# **Rethinking Well-Child Care**

### Teaching Parents to Teach Their Children?

#### JOHN C. DUBY

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n 2004, Edward Schor challenged pediatricians to rethink wellchild care. In an article published in the journal *Pediatrics*, he argued that the traditional model of well-child care was not meeting the needs of families. Families were not bringing their children for many of the recommended visits and expressed dissatisfaction with the content of the visits. Schor called for rethinking the schedule, the structure, and the content of well visits. He emphasized that most parents acknowledge that they need guidance on raising their children and that they expect their pediatrician to provide information on child development and parenting, as well as the physical aspects of their child's health (Schor, 2004). However, parents report dissatisfaction with the behavioral and developmental advice offered in the pediatric setting (Coker, Chung, Cowgill, Chen, & Rodriguez, 2009).

Similarly, Coker and colleagues (Coker, Thomas, & Chung, 2013) have questioned whether there is a future for well-child care in pediatrics. They argue that well-child care in its current form has not been effective in preventing the drivers of the chronic diseases of adulthood. They highlight the lack of evidence that pediatric well-child care has been effective in identifying and mediating the psychosocial environmental risk factors associated with toxic stress that lead to debilitating adult disease (Shonkoff et al., 2012). They propose new models that emphasize a one-stop shop approach to well-child care that would include a team of allied professionals, including early childhood development specialists and other allied professionals, or a community connections approach, in which the pediatrician becomes the coordinator of a well-organized,

community-based system of care (Coker et al., 2013).

The American Academy of Pediatrics also emphasizes the essential role of forming collaborative relationships to promote mental health resilience through reinforcing child and family strengths and counseling families in healthy lifestyles (Committee on the Psychosocial Aspects of Child and Family Health and the Task Force on Mental Health, 2009).

#### What Do Families Want?

R ADECKI ET AL. (2009) asked families what they wanted from well-child care. Among their findings were a desire to have a greater focus on their children's development and behavior during the visits as well as enhanced information exchange about healthy growth and development. Parents suggested using previsit materials to prepare them for the visit, making seminars and workshops available, using technology to provide information, and improving awareness of community resources. (Radecki et al., 2009) Coker et al. (2009) interviewed minority, lowincome families and found very similar themes. Families want more information on behavior and development and are open to

#### Abstract

Pediatricians have been challenged to rethink the schedule, content, and structure of well-child care. There is growing recognition of the need to include a focus on promoting healthy social and emotional development in the context of the parent-child relationship to minimize exposure to toxic stress and reduce the later burden of adult disease. Multiple opportunities exist for expanding the range of services delivered in the pediatric medical home and for strengthening community connections to advance the concept of teaching parents to teach their children. Public health approaches at the population level may hold the greatest promise.

a team-based approach that would involve multiple allied professionals. They are open to home visits, group sessions, and the use of technology such as text messaging to get information (Coker et al., 2009). Lane Tanner and colleagues found very similar priorities when they interviewed pediatric clinicians. (Lane Tanner, Stein, Olson, Frintner, & Radecki, 2009). In addition, Coker et al. (2013) found evidence that group well-child care visits can be as effective as 1:1 visits.

The third edition of the Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents (Hagan, Shaw, & Duncan, 2008) emphasized that children's health must be viewed in its broadest context, with healthy communities supporting healthy children. Bright Futures encourages an approach to health supervision that includes attention to health promotion activities and psychosocial factors that contribute to health while also emphasizing a focus on the strengths of children and families. Promoting mental health is identified as one of the significant challenges to child and adolescent health and, along with the additional theme of promoting child development, sets the stage for exploring creative models for supporting families in ensuring the optimal health of their children. When considering health supervision in the pediatric setting, Bright Futures emphasized that the medical home is part of a system of care. Attention to the family's priorities is essential. Availability of evidence-informed anticipatory guidance, practice-based interventions, and linkages with community services are critical.

#### **Emerging Trends**

THE AMERICAN ACADEMY OF Pediatrics Task Force on the Vision of Pediatrics 2020 identified eight megatrends that were likely to have a profound influence on the future of pediatrics (Starmer et al., 2010). The Task Force concluded that to remain competitive, pediatricians must be responsive to the needs of more informed and connected consumers of their services. They must lead innovation in the use of health information technology to serve their patients. In addition, pediatricians will partner with allied professionals in a team approach to care. These trends may be especially important when considering innovation in facing the unmet needs of families for guidance in parenting and childrearing.

David Kirp (2011) has concluded that the first of five big ideas for transforming children's lives is the opportunity to teach parents to teach their children. He argued that making high-quality, evidence-based, population-level supports for parents of young children will set the stage for the child's successful transition to preschool and ultimately a happy, productive adulthood.

Many strategies for supporting families in teaching their very young children have been developed and disseminated to varying degrees. Health care professionals should explore opportunities for integrating these models into a comprehensive system of wellchild care. Below are examples of models for promoting healthy social and emotional development through teaching parents to teach their children. These include:

- Brief Practice-Based Opportunities
- ${\scriptstyle \bullet}$  One Stop Shop Opportunities
- One Stop Shop/Community Connections Opportunities
- Community Connections Through Home Visiting
- Media Opportunities
- Population-Level Opportunities

The discussion is not intended to be exhaustive, but will highlight models that have evidence to support them as well as some innovative approaches to sharing evidenced-based information.

#### **Brief Practice-Based Opportunities**

Glascoe and colleagues (Glascoe, Oberklaid, Dworkin, & Trimm, 1998) found that parents appear to respond best to information that focuses on their specific area of concern. They note that office posters can be helpful for broadening parents' range of interests. Brief verbal suggestions are effective for simple issues, but written information should be added for addressing more complex issues (see box Resources to Use With Parents). There is evidence that modeling and role-playing appear useful when addressing problematic child behavior.

Triple P-Positive Parenting Program is a multilevel system of behavioral family intervention that is based in social learning theory (Sanders, 1999). The model includes five levels of intervention that increase in intensity depending on the individual needs of the family. Level 3, or Primary Care Triple P, is a brief 1- to 4-visit intervention, of 20 minutes each, designed to address parents' concerns about discrete behavior challenges that do not rise to the level of a clinical diagnosis. The other levels of Triple P will be described in later sections.

#### **Resources to Use With Parents**

A variety of resources are available to provide anticipatory guidance and to respond to parents' concerns or questions about challenges with parenting that are brief in duration and discrete in nature.

- Healthy Minds: Nurturing Your Child's Healthy Development is a series of handouts developed by ZERO TO THREE and the American Academy of Pediatrics. Each handout is based on findings from the report *From Neurons to Neighborhoods: The Science of Early Childhood Development* (National Research Council & Institute of Medicine, 2000). The information is age-specific through the first 3 years of life and offers strategies for parents to nurture their child's healthy development. Available in English and Spanish
- The American Academy of Pediatrics has also developed a series of posters and artwork called: *Mom! Dad! Ask the Doctor About My Emotional Development, Too!* to promote the importance of mental health as part of a health supervision visit. Additional information for families is available at the Academy's Healthy Children consumer website.
- The Centers for Disease Control and Prevention Learn the Signs Act Early initiative has adapted materials from the American Academy of Pediatrics (Hagan et al., 2008; Shelov & Remer Altmann, 2009) to create a series of Milestones Checklists that can be given to the family before a visit and can help them identify priorities for the visit. The checklists are in English and Spanish and are available for children from birth to 5 years old.
- The Ohio Chapter of the American Academy of Pediatrics has developed a series of 4 handouts to be used at the first postnatal visit, and at the 9-, 18-, and 36-month visits that focus on specific milestones and skills for promotion of healthy social and emotional development. Based on the science of early brain and child development (National Research Council & Institute of Medicine, 2000), the Building "Piece" of Mind materials are being tested in 20 primary practices in Ohio.

The resources outlined here are readily available, in the public domain, and can quickly be integrated into the primary care setting. Using these types of resources can set the stage for developing a culture within the pediatric medical home that lets families know that concerns about their child's development and behavior are a top priority.



The American Academy of Pediatrics emphasizes the essential role of forming collaborative relationships to promote mental health resilience through reinforcing child and family strengths.

Level 3, or Primary Care Triple P providers promote self-regulation within the parents so that they can better understand the cause of their child's behavior challenge, learn to track the behavior using simple tools, and learn strategies to encourage more desirable behavior and manage misbehavior effectively. Modeling and role play are used to teach parents effective strategies. An extensive series of tip sheets, videos, and provider resources are available to trained and accredited practitioners.

Turner and Sanders (2006) evaluated Primary Care Triple P as a preventive strategy in a randomized controlled trial with parents of preschoolers with mild to moderate discrete behavior challenges. Services were delivered by child health nurses in a primary care setting in Australia. Children in the intervention group showed improvement in the targeted behavior, and parents showed reduced reliance on dysfunctional parenting practices.

Primary Care Triple P may be a valuable component of a comprehensive medical home that will promote healthy parent-child interaction and has the potential to reduce the risk for toxic stress and adverse outcomes in adulthood.

#### **One Stop Shop Opportunities**

The Healthy Steps for Young Children Program was developed at Boston University in 1994 (Zuckerman, Kaplan-Sanoff, Parker, & Taafe Young, 1997; Zuckerman, Parker, Kaplan-Sanoff, Augustyn, & Barth, 2004) Healthy Steps adds a child development specialist—typically a nurse, early childhood educator, or social worker—to the health supervision team. Additional services include more time to spend discussing preventive issues during well-child visits, home visits, a telephone information line exclusively addressing developmental and behavioral concerns, written materials, and more seamless linkages to community resources and parent support groups. Enhanced wellchild visits are conducted by a pediatric clinician and the child development specialist, either jointly or consecutively. Visits are designed to administer physical examinations, answer parental questions, and to take advantage of "teachable moments" to help parents better understand their child. Risk factors such as maternal depression, substance use, and maternal stress are assessed.

Minkovitz et al. (2003) interviewed 3,737 families who participated in the Healthy Steps evaluation process at 15 sites and concluded that the program enhanced quality of care and improved selected parenting practices. Piotrowski, Talavera, and Mayer (2009) completed a systematic review of 13 studies that have evaluated Healthy Steps. They found that the Healthy Steps program is effective in preventing negative child and parent outcomes and enhancing positive outcomes, and they recommended that the Healthy Steps program be more widely disseminated to relevant stakeholders.

The Bellevue Project for Early Language, Literacy, and Education Success includes the Video Interaction Project and Building Blocks. The Project was developed in the Department of Pediatrics at New York University School of Medicine and Bellevue Hospital Center to support primary care interventions that would lead to improved child outcomes by addressing parenting and parent–child interaction.

In the Video Interaction Project, a child development specialist covers a curriculum focused on promoting supportive parent–child interaction and then facilitates interactions in play and shared reading by reviewing a video of the parent and child interacting. This offers an opportunity to discuss developmental, behavioral, and emotional issues. Fifteen 30–45 minute sessions are offered through the first 3 years of life (Mendelsohn, Cates, Weisleder, Berkule, & Dreyer, this issue, p. 29).

In the Building Blocks Project, families are mailed written pamphlets and learning materials monthly from birth until a child is 3 years old. The materials include a curriculum that encourages verbal interaction in pretend play, shared reading, and daily routines.

Mendelsohn et al. (2005) performed a randomized controlled trial with poor Latino children whose mothers had not completed high school and found that there were significant benefits in cognitive and language development for the children whose mothers had completed 7th to 11th grade, but not for those who completed 6th grade or less. Other findings have included less media exposure, enhanced provision of toys, more shared reading, more teaching, and more parental verbal responsivity at 6 months old for the Video Interaction Project group. The less intense Building Blocks intervention showed enhanced provision of toys and shared reading when compared to controls (Mendelsohn, Dreyer, et al., 2011; Mendelsohn, Huberman, et al., 2011)

When children were 33 months old, parents who participated in the Video Interactive Project were less stressed and their children were more likely to have normal cognitive development and less likely to have any delayed development (Mendelsohn et al., 2007).

Widespread dissemination of these promising practices hinges on changes in payment for health care services that recognizes the contribution of child development specialists to positive parenting and child developmental outcomes.

#### One Stop Shop/Community Connections Opportunities

Parents have reported an interest in getting information in groups, workshops, or seminars.

Level 2 Triple P offers a selected seminar series which includes an introduction to the strategies of positive parenting. Parents may attend up to three 90-minute seminars on the Power of Positive Parenting; Raising Confident, Competent Children; and Raising Resilient Children. Tip sheets are given to participants. These seminars can be hosted

in the pediatric medical home or anywhere in the community where families tend to gather and are delivered by a child development specialist, nurse, social worker, or counselor.

Sanders, Prior, and Ralph (2009) performed an evaluation of the seminar series with 109 Australian families with 4–7 year old children. They found a significant reduction in parental reports of child behavior problems and dysfunctional parenting styles with the introductory seminar alone. Participation in all three seminars was associated with significant improvements in all dysfunctional parenting styles and in the level of interparental conflict. This suggests that an intervention that requires minimal time commitment from the parents may have a positive impact on parent–child interaction.

Level 4 Triple P is a broad-based curriculum for families whose children have multiple behavior challenges that significantly affect functioning across settings. The behavior problems are likely to be chronic and a source of significant stress in the family system. Level 4 Triple P can be administered in small groups for 5 sessions or with individual families for 8–10 sessions and covers a wide range of strategies for promoting desirable behavior and managing misbehavior. Families have a workbook and homework exercises, review video examples, and are encouraged to practice new skills during sessions. The practitioner provides opportunities for modeling, role play, and constructive feedback. These activities provide substantial opportunities to foster parental self-regulation, leading to sustained benefits from the intervention (Sanders & Mazzucchelli, 2013)

Bodenmann, Cina, Ledermann, and Sanders (2008) completed a randomized controlled trial of Level 4 Group Triple P with 150 couples in Switzerland and found lower rates of child behavior problems and improvement in maternal levels of stress, parenting selfesteem, and parenting practices compared to controls and couples who received a marital distress intervention.

Level 5 Enhanced Triple P is for parents whose family situation is complicated by problems such as partner conflict, stress, or mental health issues. Four modules address partner relationships and communication, stress management, coping skills, and anger management. These modules are completed in conjunction with Level 4 services.

The Incredible Years Parenting Series is delivered in 12–14 weekly group sessions that meet for 2.5 hours. The series is designed for parents of 2–10-year-olds and the behavior management content is similar to Triple P. Videotaped examples of child behavior are used to facilitate discussion. Role play gives parents an opportunity to practice new skills and participants are encouraged to



It is important that pediatric providers be aware of the programs that are available in their communities and ensure that the connections with these resources are in place for their families that qualify.

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Today's parents of young children are constantly turning to the internet and to social media to obtain information and stay connected.

establish a social support network with other parents. The program has been shown to be effective in reducing conduct problems in children with oppositional defiant disorder/ conduct disorder and as a prevention program for families of children in Head Start, kindergarten, and first grade (Bauer & Webster-Stratton, 2006).

Level 4 and 5 Triple P and the Incredible Years Parenting Series can be offered by a mental health professional, nurse, or educator as part of a one-stop shop, integrated pediatric medical home, or in a community setting with strong connections to the medical home.

Parent Child Interaction Therapy was developed in the 1970s by Eyberg. Therapy involves 2 phases of intense direct coaching which usually requires about 15 sessions. The first phase, Child-Directed Interaction, is focused on improving the parent-child relationship and attending to positive child behavior. The second phase, Parent-Directed Interaction focuses on giving good instructions and using consistent consequences. More than 150 studies have demonstrated its efficacy, with maintenance gains up to 6 years (Funderburk & Eyberg, 2011). The therapists complete certification training and must be a licensed mental health provider with at least a master's degree.

#### Community Connections Through Home Visiting

The Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV) was authorized by the Affordable Care Act in 2010 and is administered by Health Resources and Services Administration. Funding of \$1.5 billion is earmarked through FY 2014 to provide grants to promote:

- Improved maternal and newborn health;
- Prevention of child injuries, child abuse, neglect, or maltreatment, and reduction of emergency department visits;
- Improvement in school readiness and achievement;
- Reduction in crime or domestic violence;
- Improvements in family economic selfsufficiency; and
- Improvements in the coordination and referrals for other community resources and supports.

MIECHV requires that at least 75% of grant funds be spent on programs to implement evidence-based home visiting models. Thirteen home visiting models have been approved for dissemination. Several of those models will be briefly described here.

It is important that pediatric providers be aware of the programs that are available in their communities and ensure that the connections with these resources are in place for their families that qualify. The challenge will be to achieve sustainability and broadbased dissemination after the MIECHV funding cycle ends.

Models that have been disseminated broadly over many years include Early Head Start-Home Visiting, Healthy Families America (HFA), Nurse Family Partnership (NFP), and Parents as Teachers (PAT).

Early Head Start-Home Visiting serves low-income pregnant women and families with children less than 3 years old. The program aims to promote healthy prenatal outcomes, enhance the development of young children, and promote healthy family functioning. Services include weekly, 90-minute home visits and twice-monthly social activities.

Brooks-Gunn, Love, Raikes, and Chazan-Cohen (2013) reported that at 2 and 3 years old, children involved in Early Head Start show enhanced cognitive and language skills, reduced aggressive behaviors, higher engagement with the parent during play, and higher rates of immunizations. At 5 years old, children have significantly reduced behavior problems and enhanced positive social skills and approaches to learning.

HFA is a program of Prevent Child Abuse America designed to support parents facing single parenthood, low income, a childhood history of abuse and adverse child experiences, or current or previous issues related to substance abuse, mental health issues, or domestic violence. Families must enroll during pregnancy or at the time of birth. HFA aims to

- 1. reduce child maltreatment,
- 2. increase utilization of prenatal care,
- 3. improve parent–child interactions and school readiness,
- 4. ensure healthy child development,
- 5. promote positive parenting,
- promote family self-sufficiency and decrease dependency on welfare and other social services,
- 7. increase access to primary care medical services, and
- 8. increase immunization rates.

HFA sites offer at least one 60-minute home visit per week for the first 6 months after the child's birth. After the first 6 months, visits might be less frequent and may continue until the child is 3 to 5 years old.

Dumont et al. (2008) completed a randomized trial of 1,173 families at risk for child abuse and neglect in New York. They found that rates of serious abuse among families at the highest risk for potential abuse were 75% lower in the HFA group compared to controls. This study emphasized the potential value of targeting services to those at highest risk.

NFP uses nurses to provide the most intensive intervention for the highest-risk population. Home visits lasting 60-75 minutes are offered to poor, first-time mothers beginning in pregnancy and extending through the child's first 2 years. NFP is designed to (a) improve prenatal health and outcomes, (b) improve child health and development, and (c) improve families' economic self-sufficiency and/or maternal life course development. Ideally, the first visit is

early in the second trimester and must be no later than 28 weeks gestation. The frequency of visits ranges from weekly to monthly.

Olds (2008) has summarized 30 years of research with NFP, including three randomized prospective trials with up to 15-year follow-up. He noted that the greatest benefits of the program came for the highestrisk families, namely those with low income, unmarried mothers, and particularly teen mothers. Benefits were seen in pregnancy outcomes, the child's development, and in the parental life course. His research also indicated that having a nurse deliver the services makes a difference over a paraprofessional. Olds argued that it will not be cost-effective to make such programs universally available to all pregnant women, and that the benefits for low-risk families would not be significant enough to justify the cost.

PAT gives flexibility to local programs to determine the population and length of time that they serve families from pregnancy up to kindergarten entry. PAT aims to (a) increase parent knowledge of early childhood development and improve parenting practices, (b) provide early detection of developmental delays and health issues, (c) prevent child abuse and neglect, and (d) increase children's school readiness and school success. There are 4 components: at least 10-12, 50-60 minute home visits annually; monthly group meetings; health and developmental screenings for children; and a resource network for families.

Zigler, Pfannenstiel, and Seitz (2008) studied 5,721 children in Missouri and found that those whose families had participated in PAT had better school readiness, which correlated with the length of participation in PAT, and was related to better parenting practices, more reading to children at home, and a greater likelihood of enrollment in preschool. School readiness predicted academic achievement in the third grade, supporting the notion that intervention prior to school entry is vital for positive academic outcomes in at risk children.

#### Media Opportunities

Today's parents of young children are constantly turning to the internet and to social media to obtain information and stay connected. According to the Pew Internet and American Life Project (2010a), 74% of American adults use the internet, 87% of African Americans and Latinos in the U.S. use cell phones (Pew Internet and American Life Project, 2010a), and 72% of Americans use their cell phone for text messaging (Pew Internet and American Life Project, 2010b). As of 2008, 19% had downloaded podcasts, which had more than doubled in just 2 years. Pediatric providers are well positioned to guide families toward reliable information that reflects best practice.

Text4Baby is a mobile information service designed to promote maternal and child health through text messaging. Pregnant women and new mothers who enroll receive three free text messages per week that are timed to their delivery date and continue through their child's first birthday. Text4Baby has reached more than 500,000 mothers since 2010 and is supported by a public–private partnership of health departments, academic institutions, health plans, businesses, and the federal government.

Preliminary evaluation findings indicate that Text4Baby is increasing users' health knowledge, facilitating interaction with their health providers, improving their adherence to appointments and immunizations, and improving their access to health services (Remick & Kendrick, 2013). However, others have questioned the national dissemination of a program without clear evidence to support its benefits with well-designed evaluations (Van Velthoven, Majeed, & Car, 2012).

Sanders, Baker, and Turner (2012) completed a randomized controlled trial of an intensive 8-module version of Triple P Online and found high levels of parental satisfaction with the program, reduced child behavior problems, and improved parenting practices post-intervention.

Little Kids, Big Questions: A Parenting Podcast Series From ZERO TO THREE<sup>TM</sup> is a series of 12 free podcasts that can be downloaded. The topics were chosen on the basis of input from a survey of parents. Expert interviews focus on how to apply the research of early childhood development to daily interactions with young children.

#### **Population-Level Opportunities**

Sanders (2008; Sanders et al., 2008) has argued that in order to have a truly significant impact on positive parenting to improve children's social and emotional health and overall development, services must be moved beyond the limits of the clinical practice setting and into the public health arena. By taking a universal approach to positive parenting and then offering more intensive services to those who are in greater need, improved outcomes can be seen at a population level. Prinz, Sanders, Shapiro, Whitaker, and Lutzker (2009) completed a populationlevel controlled study of community-wide, universal implementation of all levels of Triple P in South Carolina. Their study showed reductions in documented cases of child maltreatment, out of home placements, as well as visits to emergency rooms and hospital admissions for intentional injuries. These findings further support the

notion of expanding the scope of well-child care beyond the walls of the traditional exam room.

#### Conclusion

HE PEDIATRIC COMMUNITY has been challenged to rethink the traditional models for well-child

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care. Evidence indicates that an emphasis on health promotion-especially social, emotional, and developmental healthis critical to addressing the major drivers of adverse adult disease, including mental illness. The foundation for healthy social and emotional development is rooted in the quality of the parent-child relationship. There are many opportunities for the pediatric medical home to support parents in teaching their children, setting the stage for them to be healthy, productive adults. Opportunities range from brief, practicebased interventions, to expanding the scope of well-child care to include a one-stop shop model with numerous allied professionals,

including child development specialists, social workers, and mental health providers. Establishing community connections and coordinating those connections for families is another opportunity for the pediatric medical home. It is vital that pediatric providers be well connected to parenting services and home visiting programs in the communities, and to continually evaluate the ever expanding resources available in the media. In the end, a population-level, public health approach to positive parenting may have the greatest benefit in reducing the amount of toxic stress that children experience, and ultimately reducing the burden of adult chronic disease.

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# Maternal Support and Brain Development

Neuroscience Validation for the Importance of Early Caregiving Relationships

#### JOAN LUBY CYNTHIA ROGERS Washington University School of Medicine

nfant mental health clinicians and early childhood educators have long emphasized the critical importance of the early caregiving relationship (the child–caregiver dyad) in healthy child development. The central focus on enhancing the early dyadic relationship has been an axiom of infant preschool mental health since its inception. An extensive body of theoretical literature has underscored the young child's fundamental need for mirroring and nurturance from the primary caregiver. Supporting this premise, the finding that a secure attachment to a nurturing, supportive, and reliable caregiver provides the foundation for healthy development early in life in multiple domains has also been well documented by the empirical literature (Sroufe, 2005).

At the same time, basic neuroscience studies have been available for many decades demonstrating the powerful impact of early environmental stimulation on brain development in laboratory animals. Studies of laboratory rodents reared in environments with differing levels of stimulation, ranging from relative deprivation to enriched environments high in stimulation, have shown that early exposure to stimulating environments promotes increased brain growth known as "neurogenesis" (Greenough, Black, & Wallace, 1987). One biological mechanism by which environmental stimulation promotes positive brain change has also been elaborated in scientific studies in animals (Meaney, 2001). These studies have shown that maternal nurturance, in the form of licking of offspring in laboratory rodents, turns on gene expression which sets off a cascade of events that enhances the development of key brain regions. This phenomenon, which has been referred to as an "epigenetic" mechanism, provides some of the first clues to the relationship between nurture and nature. These study findings show that behavioral nurturance ("nurture") impacts "nature" or biological processes in a tangible and measureable way. In contrast to common conceptualization and historical debate about "nature versus nurture" in child development, these studies clearly demonstrate that these factors work in concert rather than independently. This paradigm shift is critically important to the conceptualization of child development and therefore to the design of future research, intervention, and public policy.

#### Abstract

Advances in brain imaging methods and technology over the last 2 decades have opened an unprecedented window into the understanding of the structure and function of the human brain. In this article, the authors describe their investigation of the relationship between maternal support, observed during the preschool period, and the size of key brain regions involved in emotion processing at school age. The findings demonstrated that maternal support had an effect on the healthy development of a brain region central to stress regulation and adaptive functioning in childhood.

#### Assessing the Human Brain

HILE THE POSITIVE effects of early caregiver nurturance and support on child behavioral developmental outcomes has been well established, the investigation of the effects of nurturance on brain development in humans is relatively new. Advances in brain imaging methods and technology over the last 2 decades have opened an unprecedented window into the understanding of the structure and function of the human brain. The human brain is a highly complex and, to date, a poorly understood organ which is central to understanding emotional and behavioral development. As a result of this new safe and noninvasive neuroimaging technology, studies of childhood brain development have become highly feasible and have been the focus of much investigation. While there are other neuroimaging modalities including computerized tomography (CT) scans and cranial ultrasound, magnetic resonance imaging (MRI) is the most commonly used neuroimaging method to assess brain development. Unlike CT, MRI does not use radiation. Conventional MRI is based on the detection of the hydrogen in ordinary water (1H2O). MRI is able to produce the most anatomically distinct structural images as it takes advantage of the different amount of 1H2O in various tissues of the brain (Neil, 2008). MRI that assesses brain function, known as functional MRI provides information based on changes in blood flow and oxygen content in the blood indicating the relative activity of various brain regions.

With conventional and functional MRI, both the structural and functional correlates of sensitive parenting (nurturance and support) can be investigated. Images produced via MRI can be analyzed in a number of ways to provide information about global and regional brain development. For instance, measures of total brain volume, gray matter and white matter volume, and brain folding can be obtained. In addition, specific regional measurements can be garnered, allowing associations between particular developmental domains, regional brain development, and exposures like measures of parental nurturance. Recent advances in MRI analysis techniques also allow assessment of regional brain function, connections between brain regions, and development of brain networks underlying specific domains of functioning (e.g., language networks). As more developmentally sensitive techniques have emerged, these structural and functional assessments of brain development can be measured in infants and very young children during natural sleep without sedation (Mathur, Neil, McKinstry, & Inder, 2008). Obtaining structural and functional



Advances in brain imaging methods and technology over the last 2 decades have opened an unprecedented window into the understanding of the structure and function of the human brain.

neuroimaging data longitudinally beginning in infancy would allow disentangling which aspects of brain development are solely genetically determined and which may result from the positive or negative environmental factors, including parental sensitivity, as well as the interactions between these factors. Using these neuroimaging methods, it was possible to investigate the effects of early maternal support on child brain development in a longitudinal study of preschoolers who have been followed into early adolescence, which we describe next.

# The Effect of Maternal Support on Brain Development

**P**OR NEARLY 2 decades, our research group at the Washington University School of Medicine's Early Emotional Development Program has been studying the characteristics of preschool onset depression. Through these studies we have learned that children as young as 3 years old can experience depression and that the symptoms are very similar to those known in older children and adults when adjustments that take into account the typical life experience of the young child are considered (Luby, Heffelfinger, et al., 2003; Luby, Mrakotsky, et al., 2003). These studies refuted previously held beliefs that preschoolers would be too young to experience the core emotions of depression or that they would display "masked" symptoms such as temper tantrums or stomachaches. A large portion of our total original study sample of more than300 preschool children, which included those who were depressed as well as healthy children who served as controls, have been followed for more than a decade and have undergone neuroimaging once they reached school age. These data have elucidated a number of findings pertinent to brain change in preschool depression. In addition, these data have also been informative for studying normative developmental processes including typical brain development in the nondepressed children

In this longitudinal study, we sought to investigate the relationship between maternal support, observed during the preschool period, and volumes of key brain regions involved in emotion processing later in development at school age. Maternal support during the preschool period was measured using a mildly stressful



With conventional and functional MRI, both the structural and functional correlates of sensitive parenting (nurturance and support) can be investigated.

standardized observational task that is designed to stress the parent-child dyad and bring out underlying interaction patterns. The task, called "The Waiting Task" has been widely used in developmental research and sets up a situation in which the caregiver is required to fill out forms while the child has to wait to open a brightly wrapped gift within arm's reach (Carmichael-Olson, Greenburg, & Slough, 1985). How the parent helps or fails to help the child manage frustration and difficulty waiting is coded using a standardized coding scheme by raters who are blind to the child's diagnostic characteristics. Because this is an objective measure of parenting, it does not rely on parent self-report, which is known to be subject to bias. Therefore, an important strength of this study design was that parenting was measured objectively in the lab under mildly stressful conditions and is therefore thought to represent typical parenting behavior. We then sought to investigate whether this measure of caregiver support predicted the volume of key brain regions involved in emotion processing, specifically the hippocampus, measured during brain scans conducted at school age. This was of particular interest as the hippocampus is a brain region known to be sensitive to the effects of stress. Along this line, numerous studies have shown a relationship between early childhood stress and trauma and smaller hippocampal

volumes in adults (Teicher, Tomoda, & Andersen, 2006). Study results showed that caregiver support observed during the preschool period predicted larger hippocampal volumes at school age (Luby et al., 2012). It is important to note that this relationship remained highly significant even when many other factors that could impact hippocampal development were considered in the analysis.

The hippocampus is a key brain region that is involved in memory, emotion processing, and stress regulation. It has been of interest in studies of depression as it is a region that is highly sensitive to changes in stress and to stress hormones. Individuals under high levels of chronic stress, such as those who suffer from chronic depression, tend to have a smaller hippocampus on average when compared to individuals who haven't experienced high levels of chronic stress. The decrease in the size of the hippocampus appears to be related to the severity and duration of depressive episodes. Smaller hippocamal sizes have been associated with poorer stress regulation in animal models. Therefore, the relationship between early caregiver support and larger hippocampal volumes is potentially quite important, with implications for key areas of functioning and adaptation. These findings demonstrate that a psychosocial variable, caregiver support, known to be fundamental to adaptive behavioral developmental

outcomes, also has a material effect on the healthy development of a key brain region central to stress regulation and adaptive functioning in childhood.

Validating the fundamental tenets of infant mental health, these studies and other emerging data similar to this underscore the critical importance of the experience of a nurturing caregiver early in life for healthy development. While these principles are well accepted and well established in the infant mental health field, findings of tangible changes in the brain make these relationships more quantifiable and therefore more convincing to those skeptics outside of the infant mental health field. Future studies that follow brain development in children from the preschool period through early adolescence are needed to further elucidate these relationships and other factors that are at play. However, the notion that early environmental factors and early interpersonal experience shapes the trajectory of brain development in childhood can serve to further validate and catalyze the exciting opportunities for early prevention and intervention in infant mental health that are already underway in the field.

JOAN L. LUBY, MD, professor of psychiatry, Washington University School of Medicine, is a child and adolescent psychiatrist who specializes in infant preschool mental health and who has been conducting studies of early childhood depression, phenomenology, and treatment for more than 20 years. She directs the Early Emotional Development Program, a clinical research program on early childhood mood disorders that is funded through the National Institute of Mental Health and private sources. She has provided some of the first empirical data characterizing depression in preschool children and is now engaged in studies of brain development and early intervention with colleagues at Washington University.

**CYNTHIA E. ROGERS,** MD, assistant professor, Washington University School of Medicine, is a child and adolescent psychiatrist and the co-director of the Perinatal Behavioral Health Service at Washington University and directs the Perinatal Behavioral Health Clinic where she evaluates and treats high-risk mother-child dyads. She also conducts research investigating the influence of adverse psychosocial stressors on infant brain development in high-risk populations.

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# **Building Brains, Forging Futures**

### A Call to Action for the Family-Centered Medical Home

#### COLLEEN KRAFT

Virginia Tech Carilion School of Medicine and Research Institute

he profession of pediatrics emerged during a time when social determinants of health meant the difference between life and death for America's mothers and children. In 1930, childbirth remained the second leading cause of death for women. About 20% of children in the United States died in their first year and about 33% in their first 5 years. Health disparities were directly related to income disparities. The Sheppard-Towner Act of 1921—sometimes called the Maternity Act—was "to reduce maternal and infant mortality." Its supporters included physicians who would eventually come to form the new American Academy of Pediatrics (AAP). Despite the demise of the Sheppard-Towner act in 1929 from lack of funding, pediatricians continued to advance child health by addressing social determinants, including nutrition, sanitation, and infectious disease. One of the early AAP presidents, Dr. John Lovett Morse, asserted the commitment to "improve the health and welfare of our children, to raise the standards of pediatric education and practice, and to encourage research in pediatrics" (Hill, 1948, p. 7). Furthermore, it was his vision that pediatricians "should take part in all the great movements that are going on; we should help direct them, not sit by and find fault because we were not consulted" (p. 7).

More than 80 years later, much has changed, yet much has remained the same. Child poverty rates have increased in the past decade. Child morbidity is reflected in rates of obesity, behavioral health problems, asthma, and other chronic diseases. Although these children will survive the first 5 years of life, it is predicted that they will not live as long as their parents. Adults who have experienced childhood adversity are far more likely to develop liver disease, cancer, ischemic heart disease, and premature death (Dube, Felitti, Dong, Chapman, et al., 2003).

*Family-centered medical home* describes an approach to providing comprehensive

primary care. In a family-centered medical home the pediatric care team works in partnership with a child and a child's family to help the family and patient access, coordinate, and understand specialty care, educational services, out-of-home care, family support, and other public and private community services that are important for the overall health of the child and family.

Research advances in developmental neuroscience, genetics, epigenetics, and translational medicine identify elements of healthy brain development in young children. Development is driven by an ongoing interaction between biology (genetic predispositions) and ecology (social and physical environment). The National Scientific Council on the Developing Child (2005) has proposed a conceptual taxonomy comprising three types of stress responses in young children—positive, tolerable, and toxic—on the basis of postulated differences in their potential to cause enduring physiologic disruptions as a result of the intensity

#### Abstract

The family-centered medical home describes an approach to providing comprehensive primary care. **Research advances in developmental** neuroscience, genetics, and epigenetics offer a framework for understanding the dynamic process of brain development. It is this process that sets the life-course trajectory for an individual; in turn, a child's educational achievement, health behaviors, development of chronic disease, and adult economic stability stem from these early interactions between genetics and experience. The translation of this science into practice by the familycentered medical home can leverage this knowledge to formulate more effective strategies to enhance lifelong outcomes in pediatric learning, behavior, and health.

and duration of the response (see box Types of Stress Responses).

The plasticity of the fetal, infant, and early childhood brain makes it particularly sensitive to toxic stress. There is growing evidence that persistently elevated levels of stress hormones can cause epigenetic changes in DNA. This results in changes in the way that genes are expressed, with dysfunction of protein synthesis and other biochemical outcomes of gene expression. Stress-induced changes in the architecture of different regions of the developing brain (particularly the amygdala, hippocampus, and prefrontal cortex) can have potentially permanent effects on a range of important functions, such as regulating stress responses, learning new skills, and developing the capacity to make healthy adaptations to future adversity. Disruption in developing brain architecture results in alteration of the child's cognitive and behavioral function.

Traditional discussions about early brain development in policymaking circles have focused almost entirely on issues concerned with school readiness as a prerequisite for later academic achievement and the development of a skilled adult workforce. The traditional health dimension of early childhood policy has focused on the components of primary pediatric care, such as immunizations, early identification of sensory

#### **Types of Stress Responses**

The nature and severity of early stressful experiences can be categorized as follows:

- **Positive stress** response refers to a physiologic state that is brief and mild to moderate in magnitude, buffered by the presence of a caring and responsive adult. The interaction between the adult and child provides a protective effect that returns the stress response to baseline. Positive stress promotes adaptive responses to adversity.
- **Tolerable stress** response is associated with exposure to a potentially damaging event. The harmful effects of serious injuries, disasters, or deaths are buffered by the supportive presence of a caring adult.
- **Toxic stress** results from strong, frequent, or prolonged activation of the body's stress response systems in the absence of the buffering protection of a supportive, adult relationship. Stressors include child abuse, neglect, extreme poverty, maternal depression with poor parent-child interaction (National Scientific Council on the Developing Child, 2005).



Child morbidity is reflected in rates of obesity, behavioral health problems, asthma, and other chronic diseases.

impairments and developmental delays, and the prompt diagnosis and treatment of medical problems (Shonkoff & Garner, 2012). The dynamic process of brain development sets the life-course trajectory for an individual; in turn, everything from that child's education achievement to economic stability to health behaviors to chronic disease stems from this "dance" of genetics and experience. This inclusive definition of "child health" creates an expanded role for the family-centered medical home.

#### Features of the Family-Centered Medical Home

R. JULIUS RICHMOND defined child development as "the basic science of pediatrics" in 1967 (Richmond, 1967). The study of the acquisition of language, movement, and cognition differentiate pediatrics from all other medical specialties. Pediatricians and pediatric primary health professionals are in the business of health promotion; they are ideally positioned to counsel families on how to optimize the development of their child as well as to monitor for risks and atypical development. The role of the pediatrician in guiding families to shape the development of their child has never been more critical. Pediatric visits in the family-centered medical home are occasions for creating therapeutic alliances with families, developmental surveillance, and family engagement-all important activities in health promotion. Yet, there remain missed opportunities for developmental promotion and surveillance within pediatric encounters.

As advances in the biomedical sciences have linked adverse childhood experiences

(ACE) to greater risk for a variety of chronic diseases well into the adult years, the specifics regarding screening, evaluation, referral, and treatment in the pediatric medical home is changing. The time has come to translate the science of brain development and its relation to the early childhood roots of adult disease into the future of the family-centered medical home.

The following elements are important features of the family-centered medical home as it evolves to translate the science of brain development to the day-to-day operations of a primary care practice:

#### Psychosocial Screening

Psychosocial screening can identify risks for developmental and behavioral disorders as well as ACEs in parents. The presence of four or more risk factors has been correlated negatively with a child's cognitive ability:

- Parental education less than high school
- Parental unemployment
- Single parent
- Three or more children in the house
- History of child abuse and other ACEs in the parent
- History of parental behavioral health problems
- Domestic violence
- Frequency of household moves (Sameroff, Seifer, Barocas, Zax, & Greenspan, 1987)

A tool such as the Safe Environment for Every Kid (Dubowitz, Lane, Semiatin, & Magder, 2012), if implemented universally, could identify both parents in need for



The study of the acquisition of language, movement, and cognition differentiate pediatrics from all other medical specialties.

caregiver support and children at risk for toxic stress. Targeted screens such as the Women Abuse Screening Tool; the Women's Experience With Battering scale; the Abuse Assessment Screen; or HITS (hurt, insult, threaten, scream) may be helpful if intimate partner violence is suspected (Kemper & Kelleher, 1996). Screening by nurses with identification of positive screens could allow an efficient workflow process.

#### Developmental and Behavioral History and Family History

Development disabilities and behavioral disorders are amongst the most common health conditions seen in children in the United States, with an estimated prevalence of 12–13% (van Dyck, Kogan, McPherson, Weissman, & Newacheck, 2004). Given this, developmental surveillance and screening are important functions of a family-centered medical home. Developmental surveillance is the informal assessment of a child's development and behavior at every pediatric encounter. When that encounter is a wellchild visit, components include:

• History—Family developmental or behavior concerns; developmental history with gross motor, fine motor, language, and social–emotional milestones; medical, family history, social and environmental risks; and identification of child and family protective factors (Hagan, Shaw, & Duncan, 2008). • Developmental observation—Gross and fine motor skills; receptive and expressive speech; social and reciprocal interactions; and abnormality on physical exam, with focus on neurologic exam. All visits should serve as opportunities for informal assessment of development. Observation of behavior, speech, and social interactions are as important as targeted physical exam for illness.

The reality is that not all children are seen for well visits, and an abnormal developmental observation (e.g., the 2-year-old with ear pain who is not talking, or the 6-year-old who is unable to sit still during a lung exam) should trigger a developmental screen. Developmental and behavioral screening should:

- Include the use of a standardized test with known reliability, validity, sensitivity, and specificity;
- Be administered routinely at ages 9 months, 18 months, and 30 months as well as when developmental concerns are expressed by families;
- Be interpreted by a pediatric health care provider at the time of the visit; and
- Identify children at high risk for a developmental or behavioral disorder.

# "Immunization" Against Developmental and Behavioral Disorders

"Immunization" against, or the prevention of, developmental and behavioral disorders is

a primary function of anticipatory guidance to families by pediatric health care professionals. Some "immunization" tips:

### RECOGNIZE THE RELATIONSHIP AS A VITAL SIGN

- The interaction between parent and child is a window into the ability of the parent to optimize their child's development (Pipan & Blum, 2011).
- Recognize whether there is a difference between how the parents interact with the child. For example, is one actively engaged with her child and the other not interacting (e.g., the parent talking to their infant vs. the parent texting on a phone while the infant is in a car seat).
- Take the opportunity to reinforce the positive relationship of the first parent and investigate the lack of interaction with the second parent.
- Education, referral, or both to family support and home visiting resources may be helpful for the family.

#### **PROMOTE THE FIVE R'S:**

- Reading—every day
- Rhyming—playing and cuddling
- Routines—so children know what to expect from adults, and what is expected of them
- Rewards—for everyday successes. Praise is a powerful reward!
- Relationship—reciprocal and nurturing, the foundation of healthy development

#### PARTICIPATE IN REACH OUT AND READ

Reach Out and Read is an office program in which books are given to young children during well visits, parents are encouraged to start reading and interacting with their children, and reading is modeled by an adult in a pediatric waiting room. (See Learn More.)

#### PROMOTE LANGUAGE-RICH ENVIRONMENTS

Back and forth speech, or "serve and return" interactions, between adults and children in the same household help develop early language skills. This is most important for younger children as parents need to understand that this behavior is part of normal development and not defiance on the part of the child. Parents need to recognize, for example, that a 12-month-old is not being "bad" but rather is learning by independently exploring the environment. It is the toddler's "job," if you will, to push limits and a parent's job to reinforce limits.

#### Partnership With Early Childhood Professionals

Family-centered medical homes should

seek opportunities to partner with other early childhood professionals in the ongoing promotion, family support, and monitoring of their patients' development and behavior. Home visiting, quality early care and education, and in-office partnerships such as Healthy Steps (Zuckerman, Parker, Kaplan-Sanoff, Augustyn, & Barth, 2004) can function to address family support and education needs (Peacock, Konrad, Watson, Nickel, & Muhajarine, 2013). In addition, these organizations may:

- Assist families in care coordination
- Facilitate referrals to community resources (e.g., early intervention), medical evaluations (e.g., audiology) and community supports (e.g., parenting groups, nutrition services, social work)
- Identify community needs that are important in managing population health
- Assist transition across multiple settings, (e.g., early intervention, health care, education)
- Assist parents and patients in communicating with family-centered medical home providers and preparing for visits
- Reinforce advice and anticipatory guidance given by family-centered medical home
- Monitor up-to-date immunizations and family-centered medical home visits
- Foster cultural and linguistic competence for families and patients, because home visiting providers see families in their home environment
- Identify nutrition and living condition needs and perform environmental and safety assessments
- Reinforce injury prevention strategies
- Improve identification, treatment, and prevention of parental depression
- Oversee and assist provision of complex health care in the home of children with serious ongoing health conditions and help to balance the needs of the affected child with those of other family members
- Identify the necessity of equipment for children with special needs and for implementing prescribed care in the least disruptive manner
- Educate medical students and residents in the benefits of home visiting services

#### Evaluation of Children With Developmental Disabilities

The family-centered medical home is optimal place to serve as the "headquarters" for the evaluation of children who have been identified as having developmental delays (Jellinek, Patel, & Froehele, 2002).



Developmental surveillance is the informal assessment of a child's development and behavior at every pediatric encounter.

Professionals involved in coevaluation include:

- Developmental pediatricians, child neurologists, and other pediatric subspecialists can provide medical evaluation and guidance for comanagement.
- Physical, occupational, and speech therapists provide specific treatment to promote development in gross motor, fine motor, sensory integration, and receptive and expressive language.
- Behavioral health specialists provide evaluation in specific diagnoses, cognitive and academic testing, behavioral interventions, traumainformed care, parent-child interactive therapy, and applied behavior analysis.
- Early intervention provides in-home family support and mentoring in promoting developmental skills, and school systems provide early childhood special education services and therapy directed for educational needs.

#### **Early Intervention**

**E** ARLY INTERVENTION IS a federally mandated program authorized under the Individuals With Disabilities Education Act (IDEA). Available in every community in the United States, early intervention identifies and coordinates services for infants and toddlers with disabilities and their families. Referral can and should be made for any suspected developmental delay, even in the absence of a diagnosis. Children referred are evaluated by educational specialists and therapists (i.e., physical, occupational, speech), often the same therapists who treat patients in a traditional medical model of once or twice a week center-based therapy sessions.

Early intervention services are mandated to meet the needs of children with delays in one or more of the following areas:

- Physical development
- Cognitive development
- Communication development
- Social and emotional development
- Adaptive development

An individual family services plan is the child's care plan in early intervention. Early intervention uses a parent education and mentoring model for therapy in contrast to the medical model of physical, occupational, and speech therapy described above. Both methods may be appropriate for the same child at different times.

#### Learn More

NATIONAL CENTER FOR MEDICAL HOME IMPLEMENTATION www.medicalhomeinfo.org

MEDICAL HOME PORTAL www.medicalhomeportal.org

REACH OUT AND READ www.reachoutandread.org



Observation of behavior, speech, and social interactions are as important as targeted physical exam for illness.

#### Management of Children With Developmental and Behavioral Disabilities

The family-centered medical home can serve as the "headquarters" for the management of children who have been identified as having behavior problems or developmental delay. Components of management include:

- Care planning with families of children with developmental disabilities, recognizing the family's expertise and goals for the care of their child;
- Care plan shared with school, child care, and other personnel who care for the child;
- Team-based care with nurses, clerical staff, and care coordinators to help the family and patient access, coordinate, and understand specialty care, educational services, out-of-home care, family support, and other public and private community services;

- Comanagement and communication with pediatric subspecialists; and
- Collaboration with pediatric therapists and behavioral health specialists.

#### Conclusion

HE BASIC SCIENCE OF pediatrics offers a framework for a deeper understanding of the biology and ecology of the developmental process. More important, it presents a compelling opportunity to leverage this knowledge to formulate more effective strategies to enhance lifelong outcomes in learning, behavior, and health.

Recognizing both the value and the limitations of what can be accomplished within an office visit, twenty-first century pediatrics is well positioned to serve as the engine for a broader approach to health promotion and disease prevention. Day-today operations guided by the new science of early brain development together with interactive partnerships with early childhood professionals can expand pediatricians' scope from individual care to population health.

The pediatric medical home of the future could offer more than the early identification of concerns and timely referral to available programs. Enhanced collaboration between pediatricians and community-based agencies could be testing intervention strategies rather than simply improving coordination among existing services (Fine & Mayer, 2006). The interventions that strengthen the capacity of families and communities to protect young children from the disruptive effects of toxic stress will promote healthier brain development, enhanced physical and mental well-being, and an educated, productive workforce.

The science is new, but the ideas are core to field of pediatrics. As Dr. Lee Forrest Hill wrote in the first edition of *Pediatrics* in 1948,

We should not be troubled because issues develop. These are a certain sign of progress. Let us beware when we have no problems. The Academy has grown to a position of great prestige and of leadership throughout the nation in all matters pertaining to the health and welfare of children. In its large membership are representatives of all branches of pediatric endeavor, including private practitioners, teachers, research workers, and those from the field of public health. There must be unity of action, broadmindedness, self-effacement, and willingness to contribute in time and effort for the attainment of common objectives. It should not be thought that the Academy has reached its goal, but rather that a good beginning has been made (p. 7).

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# Early Brain and Child Development

Connections to Early Education and Child Care

JUDITH T. ROMANO

Wheeling Hospital Wheeling, West Virginia

ew activities in the practice of children's health care touch as many areas as early care and education. Virtually every aspect of a child's health and safety—from physical growth to the developing social-emotional wellness—is impacted by the setting in which they spend their time. The pediatrician or child health care provider who chooses to address this topic, be it for their individual patients or for a wider population, will find broad opportunities to support children and families on an individual, community, or national basis through advocacy. Further, because the vast majority (73%) of all infants and children younger than 5 years old spend time in out-of-home settings, this topic takes on profound importance. Each week, nearly 11 million younger than 5 years old are in some type of child care setting for an average of 35 hours (Child Care Aware of America, 2013). Early care and education settings represent a promising venue for addressing the Early Brain and Child Development (EBCD) agenda set forth by the American Academy of Pediatrics (AAP).

The 2000 National Research Council and Institute of Medicine report *From Neurons to Neighborhoods: The Science of Early Childhood Development* called for a re-examination of attitudes and policies surrounding childhood development. This report virtually "started the conversation" that 13 years later has reverberated to all levels of government, business, communities, and educational and health care systems. The importance of early experiences, nurturing relationships, and the environment on children was certainly not new to pediatricians. However, the resulting explosion in other disciplines, such as the biologic, behavioral, and social sciences, has led to a new understanding that the foundations of health (or disease) are built in early childhood (National Research Council & Institute of Medicine, 2000).

# The Ecobiodevelopmental Framework

The Ecobiodevelopmental FRAMEWORK for the science of pediatrics described by Shonkoff and Garner (Shonkoff et al., 2012) shows that promoting health and preventing disease involve interplay among personal experiences, environmental influences, and genetic predispositions.

Perhaps the most dramatic development in the understanding of early influences on later development involves the well-documented association between childhood adversity and its negative effect on adult health. The rapid development of the child's brain and its sensitivity to the environment helps explain how physiological disruptions during sensitive developmental periods can result in lifelong health problems. The number of adverse childhood events is directly proportional to the risks of poor adult health

#### Abstract

The vast majority of young children spend time in settings outside of the home, and the nature of those settings directly impacts the child's health and development. The ecobiodevelopmental framework of early brain and child development serve as the backdrop for establishing quality. This article describes the use of quality rating systems, initiatives for systems building for early childhood settings, and the role of the pediatrician.

care and medical homes, social-emotional development and mental health, parenting education, and family support. Pediatricians have been active in many states due to opportunities provided by these grants.

#### Head Start Reauthorization Act of 2007

The Head Start Reauthorization Act of 2007 recognized that no state had the ideal comprehensive early childhood system to meet the needs of the 21st century. This legislation mandated that each state governor establish an Advisory Council on Early Childhood Education and Care for children from birth to school entry. The legislation indicated that grants from the federal government would support the work of the councils. To qualify for federal support, councils are required to address certain issues, including: conducting needs assessments, identifying barriers to collaboration between federal and state programs, developing recommendations for increasing the participation of children and early childhood services, developing recommendations for a unified data collection system, supporting professional development, assessing the capacity of higher education to support the development of early childhood educators, and making recommendations to improve early learning standards. Many state Advisory Council members are pediatricians.

#### **RTT-ELC Grants**

The U.S. Department of Education and Department of Health and Human Services, through the RTT-ELC grants, are supporting systems building in early childhood education. These grants, totaling \$500 million, now are being administered in several states. They are used to:

- Measure outcomes and progress, including kindergarten entry assessment and building an early learning data system.
- Create high-quality, accountable programs statewide for children with high needs.
- Tie early learning and development outcomes for children to a concrete, comprehensive standards and assessment system, screening and addressing health, behavioral, and developmental needs and family engagement.
- Create successful state systems with committed reform agendas, as well as coordinated and budgeted systems.
- Create an early childhood education workforce with demonstrated competencies.

The program acknowledges the various funding streams, program standards, and requirements of child care, Head Start, and

publicly funded preschool programs. The challenges states must address in the RTT-ELC are to "sustain and build on the strengths of these programs, acknowledge and appreciate their differences, reduce inefficiency, improve quality, and ultimately deliver a coordinated set of services and experiences that support young children's success in school" (Office of Child Care, 2011, pp. 4–5). States are required to develop a common set of program standards to align early childhood programs, including child care, Head Start, and publicly funded preschool.

#### The BUILD Initiative

The BUILD initiative was created in 2002 by the Early Childhood Funders Collaborative, a consortium of private foundations. It helps states construct a coordinated system of programs, policies, and services that responds to the needs of young children and their families. BUILD's goal is to develop a comprehensive early childhood development system for states. It created the Early Learning Collaborative to assist states in preparing for the RTT-ELC grants. BUILD, as part of the QRIS National Learning Network, is also assisting states in QRIS development.

#### Elements of Quality in ECE

A LTHOUGH A GENERAL understanding of initiatives and QRIS is helpful for pediatricians, to be truly effective advocates for families a deeper understanding of elements in early childhood education is necessary.

#### Program Quality Standards

Program quality standards describe the expectations for the characteristics or quality of early care and education settings. They reflect the structure and practices of programs to provide safe, legal, and effective services to children.

Although some national programs have created standards, such as the Head Start Program Performance Standards, some state systems have developed their own. To be meaningful, however, there should be universal standards for health, safety, development, and family support that ensure the safety of children as well as prepare them for a lifetime of learning and success. There are some common content areas among the states, as well as among the various state programs, including:

- Preservice qualifications and ongoing professional development
- Curriculum and learning activities
- Child assessment
- Children's health
- Family engagement (Office of Child Care, 2011).



Quality early experiences hold the greatest opportunity to ensure individual, and thus national, success.

Because most states have program quality standards related to the five common core areas, their understanding is important for early education and child care providers, educators, and health care providers.

#### **Licensing Standards**

Licensing is the foundation for states' QRIS systems, often representing the first level or a prerequisite for the system. Licensing regulations have a statutory basis, although states vary significantly in enforcement and compliance monitoring. Licensing sets a baseline of requirements to help protect the health and safety of children in out-of-home care. Health and safety is rarely included in QRIS standards because those areas are strong in licensing requirements. In some states, however, licensing may only address the basic bare minimum of health and safety. By advocating for inclusion of evidence-based standards found in Caring for Our Children: National Health and Safety Performance Standards; Guidelines For Early Care and Education Programs (AAP, American Public Health Association, & National Resource Center for Health and Safety in Child Care and Early Education, 2011), pediatric health care providers and early childhood educators can support best practices.

Child Care Aware of America has been reviewing state child care program



It is the pediatrician who sees the baby and family about 10 times during the first 2 years of life and is viewed as a trusted resource on everything from feeding to discipline.

requirements and oversight for 7 years. State licensing policies, which include both program requirements and oversight, are reviewed using 15 benchmarks representing the most basic research-based criteria. Rankings are applied for child care center program requirements and for center oversight, and then an overall combined ranking is assigned. Although progress has been made in many states since the last report in 2007, no state in the 2013 report earned an "A" and only the Department of Defense secured a "B." The remaining top 10 states earned a "C," and 21 states earned a "D." The remaining 20 states received a failing grade. Considering that most parents equate a child care license with state approval, it's obvious a better job must be done in providing high-quality care and educating the public about what that means (Child Care Aware of America, 2013).

#### Early Learning Standards

A few states, as part of their QRIS, are using early learning standards to reflect what a child should know and be able to do at particular points or ages along the learning continuum. These standards are used to teach the early childhood educators and build a connection to the curriculum, which becomes the basis for child assessment. The development of early learning standards is the perfect opportunity to embed EBCD principles. As previously discussed, positive parenting and positive relationships in early childhood result in social, emotional, and language skills that build resilience, which supports healthy, adaptive coping skills. Pediatricians are encouraged to assist states in these efforts, and such participation has already proven successful.

#### **Rating Scales**

Another feature of QRIS is the easy-tounderstand ratings system publicly available to assist parents and other consumers. By providing these ratings directly to the public, parents can look for quality. The resulting talking points can be shared among early childhood professionals, health providers, and parents. Pediatricians are a perfect portal for providing the information.

#### **Professional Development**

QRIS also addresses professional development, increasing the educational support and advancement of child care providers, which supports quality. This includes training and basic educational requirements for directors and teachers.

#### **Program Evaluation**

Because better outcomes for children represent the driving force behind QRIS, evaluation of the systems themselves is required. The use of QRIS is expanding rapidly across the country with most states either already using it or making plans. Simply having a QRIS will not necessarily improve the quality of early learning opportunities. But evaluation will enable comparisons of outcomes across different types of programs, as well as address accountability and assess efficiency (Zellman, Brandon, Boller, & Kreader, 2011).

All professionals dealing with young children will have to be involved in the ongoing search for the "Holy Grail" of early education and child care experiences that will provide not only for children's health and safety, but also for the development of healthy, resilient brains.

#### Building Bridges Among Health and Early Childhood Systems National Pediatric Initiatives

PEDIATRICIANS HAVE A long history of advocating for quality early education and child care, and optimal physical, cognitive, and social-emotional development through collaborative efforts such as the ones described below.

#### Healthy Child Care America

Healthy Child Care America is a collaborative effort of health professionals and child care providers to improve the early education and health and safety of children in out-ofhome child care and early education settings. This includes increasing access to preventive health services, safe physical environments, and a medical home for all children. The program also strives to increase pediatrician participation and effectiveness in providing high-quality care, and promoting early education and children's health and well-being.

The Healthy Child Care America program is coordinated by the AAP, Early Education and Child Care Initiatives (the Section on Early Education and Child Care), and is partially funded by the Office of Child Care, Administration for Children and Families, the Maternal and Child Health Bureau of the U.S. Health Resources and Services Administration, and U.S. Department of Health and Human Services. Created in 1995, the collaboration has forged strong links between health and child care professionals. The Section on Early Education and Child Care became a permanent AAP Section in July 2008, providing a forum for pediatricians and other child health practitioners interested in promoting the optimal development, health, and safety of children in child care. The AAP has appointed Chapter Child Care Contacts (CCCC) in its state chapters to provide a network of pediatric child care experts who can mobilize improvement efforts and engage parents in discussions about quality care. The CCCCs are liaisons between the state and the national section, and they work with a variety of health professionals and early education professionals.

#### Building Bridges Among Health and Early Childhood Systems

A good example of the work done by pediatricians as CCCCs is the Building Bridges Among Health and Early Childhood Systems project, a collaboration between the AAP chapters and state early childhood systems. The project aims to establish leadership in EBCD at the state level to develop sustainable connections between medical home; Maternal, Infant, and Early Childhood Home Visiting Program; early education and child care programs; Title V Maternal and Child Health Block Grant; and other early childhood initiatives such as Help Me Grow. Teams of a CCCC and a senior-level state early childhood leader participated in a leadership collaborative for training in EBCD research and early childhood systems building, which helped them develop a statewide project. Twenty states have been awarded funding for their projects.

#### **One Pediatrician's Personal Perspective**

As a long-time AAP and Section member, I have had the opportunity to participate in policy development, curriculum development, and a myriad of educational opportunities for other pediatricians, child health providers, and early childhood educators. My work as a CCCC has provided the opportunity to learn about early childhood systems and be a part of the radical redesign of those systems in my state. Seeing the principles of EBCD drive this redesign has been very exciting.

In addition, I have had the honor of serving on Ohio's Early Childhood Advisory Council and have experienced the move toward an integrated comprehensive early childhood system. As a RTT-ELC grant recipient, Ohio plans to improve the quality of programs that serve high-needs children from birth to 5 years old. The state also will carefully measure the results of those programs in alignment with Gov. John Kasich's goal of creating better metrics and coordination among agencies serving young children. Ohio's overall goal is to increase kindergarten readiness, especially for high-needs children, with readiness to include cognitive, social, emotional, and physical well-being. The mechanism to do this will be provided by many of the structures described in this article; specifically, use of a QRIS participation requirement and tracking of all outcomes. The goal is to provide a single definition of quality, inclusive of all program types, that is measurable, is easy to understand, and provides flexibility on how programs achieve the highest levels of quality. The proposed standards will be the basis of Ohio's monitoring and continuous

Promoting health and preventing disease involves interplay among personal experiences, environmental influences, and genetic predispositions.

improvement system, which will be used by the Department of Education and the Department of Job and Family Services.

My experience on a writing team developing Ohio's Birth-Kindergarten-Early Learning and Development Standards is a great example of a collaborative effort of state agencies. The standards, which were adopted by the State Board of Education, represent all domains of school readiness to reflect the comprehensive development of children beginning at birth. State agencies worked with national experts and writing teams representing education, health, mental health, developmental disabilities, and the Governor's Office of Health Transformation. Embedding EBCD principles into these learning standards was truly a team effort and very exciting for me.

Ohio is one of the states awarded funding through the Building Bridges Among Health and Early Childhood Systems grant. As Ohio's CCCC, I am part of the leadership team developing an education program for Ohio's Help Me Grow Home Visitors on toxic stress and the science of EBCD. This project is a perfect example of multiple professionals and departments coming together around young children regarding EBCD.

All of these experiences and the knowledge gained help me be a better pediatrician. When I am seeing newborns in the clinic, I always ask the parents about their child care arrangements. Helping them understand the importance of health, safety, and quality in the care that they choose for their baby is as important as monitoring growth. Always keeping in mind the importance of the parental relationship and making observations about it is another mechanism I use in primary care. By encouraging early literacy, I am supporting the relationship between parent and baby, as well as supporting early brain development. For older toddlers, I encourage quality early education experiences such as Head Start or publicly funded preschool. Parents value, and often act upon, the recommendations of their pediatrician.

A common thread in all of this work is the importance of relationships. I am amazed at the depth of commitment of the individuals in my state who work on early childhood issues. The relationships that have developed, and continue to be created, are of paramount importance in reaching the goals of healthy children, which will result in healthy communities and robust economic development. Just as brains are built over time, so are professional relationships, and with a common goal all the members of these collaborations can succeed.

JUDITH T. ROMANO, MD, FAAP, a pediatrician from Martins Ferry, Ohio, is a longtime advocate for children in Early Education and Child Care, working on community, state, and national levels. She is an advisor to local Head Start organizations in West Virginia and Ohio and a past member of the West Virginia Cabinet on Families and Children. She currently serves as the Ohio Chapter Child Care Contact, president of the Ohio Chapter American Academy of Pediatrics (AAP), and is on the Ohio Early Childhood Advisory Council. She is a founding member of the Early Education and Child Care Special Interest Group which became the Section on Early Education and Child Care of the AAP. She is a past chair of that group and has also served on the Committee on Early Childhood, Adoption and Dependent Care for the AAP. She has been honored as West Virginia Pediatrician of the Year for 2003, the 2013 Child Advocate of the Year for Belmont County Ohio for 2012, and was the recipient of the Susan Aronson Advocacy award from the Section on Early Education and Child Care in 2012. She is the founder and director of the Wheeling Hospital Center for Pediatrics in Wheeling, WV, which is an innovative model of care bringing medical homes to children in Appalachia.

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# Promotion of Early School Readiness Using Pediatric Primary Care as an Innovative Platform

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overty is strongly related to disparities in early child development, school readiness, and educational achievement. The early emergence and long-term persistence of these disparities underscore the need for preventive intervention prior to school entry. For many families, pediatric health care provides the primary contact with professionals who have expertise related to children prior to school entry. Pediatric health care therefore represents an innovative platform for implementation of low-cost, population-wide, preventive interventions to improve school readiness.

More than 2 decades of research have documented the potential for pediatricbased intervention to impact child outcomes through enhanced parenting. The most widely studied intervention to date is Reach Out and Read (ROR), which promotes shared reading activities during pediatric primary care visits. ROR includes three components: modeled shared reading activities, provision of children's books, and provision of parental guidance regarding the importance of and strategies for shared reading (Klass, Needlman, & Zuckerman, 1999; Needlman, Klass & Zuckerman,

2006). Established impacts of ROR include increased shared reading activities and enhanced child language development (Mendelsohn, 2002).

Building on the success of ROR, the Bellevue Project for Early Language, Literacy and Education Success (BELLE) Project was developed at New York University School of Medicine and Bellevue Hospital Center in order to further study the potential for pediatric-based interventions to improve child development, school readiness, and educational trajectories for children at risk due to poverty. In particular, the BELLE Project has sought to build on ROR to determine whether increased dose or intensity (or both) of pediatric-based intervention is associated with increased impact.

This article provides an overview of existing pediatric health care based interventions and associated impacts of those interventions on parenting and child development. We begin with a review of literature on responsive parenting, which suggests that intervention

#### Abstract

Pediatric health care represents an innovative platform for implementation of low-cost, population-wide, preventive interventions to improve school readiness. This article describes the Video Interaction Project, a targeted intervention in the pediatric primary care setting designed to enhance parenting skills and boost school readiness. The results support the role of pediatric primary care parenting intervention programs during the first 3 years for reducing poverty-related disparities in early child development and school readiness.

<sup>\*</sup> Note: Dr. Mendelsohn and Dr. Cates are co-first authors for this manuscript.



Disparities in skills related to school achievement begin early during the preschool period.

targeting responsive parenting is crucial for addressing poverty-related disparities in educational trajectories. The second section describes the rationale for delivering interventions to enhance responsive parenting within pediatric primary health care and provides an overview of ROR as an example of such interventions. The third section describes recent work within the BELLE Project to develop, implement, and study an intervention called the Video Interaction Project (VIP). VIP builds on ROR by adding innovative strategies based on current work in education, developmental psychology, and infant mental health. The final section describes findings to date from two clinical trials testing the impact of VIP on responsive parenting and child development.

#### **Poverty-Related Disparities**

UMEROUS POPULATION-BASED studies have documented povertyrelated disparities in early child development and school readiness (Aber, Jones, & Cohen, 2000; Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Hillemeier, Farkas, Morgan, Martin, & Maczuga, 2009; Magnuson, Lahaie, & Waldfogel, 2006; NICHD Early Child Care Research Network, 2005a). Taken together, these studies provide compelling evidence that disparities in skills related to school achievement begin early during the preschool period—with differences that become apparent shortly after the emergence of first words (Hart & Risley, 1995) and persist as children advance in school (U.S. Department of Education, 2011). The early onset of these disparities

is especially concerning, given that early differences in developmental outcomes across cognitive-language and socialemotional domains predict long-term trajectories related to language (Walker, Greenwood, Hart, & Carta, 1994), reading achievement (Cunningham & Stanovich, 1997; Juel, 1988; Pianta, Belsky, Vandergrift, Houts, & Morrison, 2008; Senechal & LeFevre, 2002; Tabors, Snow, & Dickinson, 2001), and need for special education (Delgado, Vagi, & Scott, 2006; La Paro, Olsen, & Pianta, 2002).

Adverse impacts of poverty on responsive parenting are thought to contribute to disparities in educational achievement (Aber et al., 2000; Bronfenbrenner, 1977; Hart & Risley, 1995; National Research Council & Institute of Medicine, 2000; Rimm-Kaufman & Pianta, 2000; Sameroff, 1975). Responsive parenting is an umbrella term bringing together many aspects of parent-child interaction critical for children's early development and school readiness (Bradley & Corwyn, 2005; Brooks-Gunn & Markman, 2005; Landry, Smith, & Swank, 2006; Landry, Smith, Swank, & Guttentag, 2008; Pachter, Auinger, Palmer, & Weitzman, 2005; Raikes et al., 2006; Raver, Gershoff, & Aber, 2007; Tamis-LeMonda, Bornstein, & Baumwell, 2001). Two interrelated domains of responsive parenting are cognitive-language and affective-emotional interactions (Landry et al., 2008). Cognitive-language interactions include: cognitive stimulation (e.g., engaging in teaching activities), verbal scaffolding (e.g., structuring tasks to account for the child's abilities, providing rich language input such as labeling objects and actions), and verbal responsivity (e.g., responding to child's

vocalizations with imitations and expansions, engaging in back-and-forth conversation, asking questions). Affective-emotional interactions include: contingent responsivity and sensitivity (e.g., taking the child's perspective, responding appropriately to the child's signals, supporting the child's focus of interest, avoiding intrusive behaviors), and positive regard and warmth (e.g., providing affirmations, praise, affection; lack of harsh discipline; lack of negative tone or words; lack of anger or rejection).

Shared reading and play provide ideal contexts for both cognitive-language and affective-emotional interactions by providing opportunities for cognitive stimulation and rich language input, contingent responsivity and warmth, and conversation related to emotions and experiences (Barkley, 1997; Berkule et al., 2008; Bus & van IJzendoorn, 1992; Carpendale & Lewis, 2004; Greenberg, Kusché, & Speltz, 1991; Hoff-Ginsberg, 1991; Hutto, 2008; Morrow & Schikedanz, 2006; Morrow & Young, 1997; Nelson et al., 2003; Neuman, 1996; Tabors, Roach, & Snow, 2001; Tamis-LeMonda, Cristofaro, Rodriguez, & Bornstein, 2006; Tomopoulos et al., 2006; Vygotsky, 1978; Whitehurst et al., 1988). As a result, these contexts have an especially important role in fostering positive child development and school readiness.

A variety of poverty-related factors affect parents' ability to engage in shared reading and play, with concomitant reductions in cognitive-language and affective-emotional interactions and consequences for child development and educational achievement (Aber et al., 2000; Bronfenbrenner, 1977; Hart & Risley, 1995; National Research Council & Institute of Medicine, 2000; Rimm-Kaufman, Pianta, Cox, & Bradley, 2003; Sameroff, 1975). These factors include material hardship, low education and literacy, low health literacy, and psychosocial stressors. Material hardship can reduce availability of learning materials such as toys and books that facilitate shared reading and play (Bradley, 1993; Bradley & Caldwell, 1984; Bradley et al., 1989; Katz, 2001; Tomopoulos et al., 2006). Low education, low literacy, and low health literacy are barriers to reading, teaching, and play interactions in the home (Green et al., 2009; Sanders, Zacur, Haecker, & Klass, 2004). Psychosocial stressors, such as lack of social support and depressive symptoms, can also be barriers to these activities and are associated with reduced responsivity (Field, 1998; Osofsky & Thompson, 2000; Smith, Landry, & Swank, 2005). In addition, television exposure is more frequent in low-socioeconomic status (SES) households (Rideout & Hamei, 2006), which may lead to fewer reading and teaching activities (Tomopoulos et al., 2006) as well as reduced verbal interactions (Christakis et al.,

2009; Mendelsohn et al., 2008). All of these factors, particularly when working together, may lead to "toxic stress" (Shonkoff et al., 2012), further reducing the quality of parent– child interactions.

#### Pediatric Primary Health Care: An Underused Platform

PEDIATRIC PRIMARY CARE represents an important and underused platform for intervention to promote child development and school readiness through enhanced responsive parenting (Dreyer, 2009). There are five characteristics of the pediatric primary care platform that highlight its potential utility:

1. Potential for population-wide

dissemination: Because of requirements for screening and immunizations prior to school entry (American Academy of Pediatrics, 2009), pediatric primary care visits have the potential to deliver interventions universally, to all children in the United States. Indeed, the ROR program described below presently reaches approximately 4 million young children per year, including more than 25% of 11.7 million low-income birth to 5-yearold children in the U.S. today (Chau, Thampi, & Wight, 2010).

- 2. Potential for dose: There are 13-15 standard pediatric primary care visits from birth to 5 years old (American Academy of Pediatrics [AAP], 2002; Jellinek, Patel, & Froehle, 2002; Sturner, 1998), with additional preventive visits related to medical problems (e.g., obesity, asthma) that are common in low-SES populations. This schedule of visits provides an opportunity for a dose that is comparable to that of home visiting programs shown to be effective (Dishion et al., 2008; Landry et al., 2008). Indeed, as will be shown below, this dose has resulted in important improvements in parenting and child development.
- 3. Potential to intervene early: Preventive interventions prior to school entry have potential for greater impacts, relative to their cost, than interventions later in life (Knudsen, Heckman, Cameron, & Shonkoff, 2006; National Research Council & Institute of Medicine, 2000). Pediatric primary care provides a platform for intervening during this critical period.
- 4. Potential to build on elements already within well-child visits: Well-child visits optimally take place in the context of a long-standing relationship between family and health care provider in the medical home (AAP, 2002). Preventive counseling ("anticipatory guidance") with a

focus on parenting has a prominent place in well-child visits and is fostered by the family-provider relationship (Brazelton, 1976, 1994; Dinkevich & Ozuah, 2002). Promotion of parenting related to development and school readiness through enhanced shared reading through programs such as ROR is presently considered standard of care in pediatric practice (Hagan, Shaw, & Duncan, 2008).

5. Potential for low cost: By leveraging existing health care infrastructure and travel to pediatric visits, health care interventions have reduced costs compared to home visiting programs. ROR and Video Interaction Project (VIP), which take place entirely within pediatric primary care, are estimated to cost \$8 and \$150 per child per year, respectively. In contrast, traditional strategies using early childhood education models are approximately \$10,000 to \$15,000 per child per year, while traditional home visitation models cost approximately \$1,500-\$4,500 per child per year (Nurse-Family Partnership, 2011).

#### ROR: The Most Widely Studied Pediatric Intervention

ROR was developed at Boston City Hospital in 1989 by Barry Zuckerman, MD, Robert Needlman, MD, and Kathleen Fitzgerald Rice, MSEd. ROR is an intervention program that attempts to enhance responsive parenting through the promotion of shared reading (Klass et al., 1999; Needlman et al., 2006; Zuckerman, 2009). It takes place during well-child visits from 6 months to 5 years old, and integrates parent-child reading activities into the child's medical care. ROR consists of a waiting room component in which volunteers model reading activities, anticipatory guidance about literacy development given by health care providers, and distribution of age-appropriate children's books at each well-child visit. Numerous studies have documented ROR impacts, including increased parent-child shared reading (Golova, Alario, Vivier, Rodriguez, & High, 1999; High, Hopmann, LaGasse, & Linn, 1998; Needlman, Fried, Morley, Taylor, & Zuckerman, 1991; Needlman, Toker, Klass, Dreyer, & Mendelsohn, 2005) and enhanced child language skills (High, LaGasse, Becker, Ahlgren, & Gardner, 2000; Mendelsohn et al., 2001; Mogilner, Mendelsohn, Dreyer, Bohn, & Dixon, 2001; Sharif, Reiber, & Ozuah, 2002) across cultures and languages (Silverstein, Iverson, & Lozano, 2002; Weitzman, Roy, Walls, & Tomlin, 2004). ROR's simplicity and low cost have facilitated successful dissemination to more than 4,000 sites in the U.S. and internationally (ROR, 2009). These ROR sites are assisted, coordinated, or both by the ROR National Center, directed by Perri Klass, MD.

#### VIP: Pushing the Limits of Primary Care

T N THE MID 1990s, following the initial studies of ROR, we and our colleagues began research to determine whether increasing the intensity of intervention would



Pediatric primary care represents an important and underused platform for

intervention to promote child development and school readiness.

result in enhanced outcomes. We were particularly interested in building on the ROR model, in which a targeted rather than a broad-based intervention had been shown to have specific effects on parent-child interaction and on school readiness factors related to educational trajectories. VIP builds on ROR by having an interventionist that videotapes parents interacting with their children at the time of well-child visits and then reviews the videotape to promote self-reflection and reinforce strengths in the interaction. VIP incorporates principles from primary care-based and home-based interventions that have been shown to be effective in enhancing responsive parenting, including the following four strategies:

#### 1. Maintaining a targeted focus for

intervention: VIP expands on ROR as a targeted intervention promoting responsive parenting in play and shared reading. Targeting parent-child interaction is also a key component of home-based programs such as the Parent-Child Home Program (PCHP) and Playing and Learning Strategies (PALS). In PCHP (P. Levenstein, S. Levenstein, & Oliver, 2002; P. Levenstein, S. Levenstein, Shiminski, & Stolzberg, 1998; Madden, P. Levenstein, & S. Levenstein, 1976), home visitors provide toys and books, and model interactive activities twice a week from 2 to 4 years old. In PALS (Landry et al., 2006; Landry et al., 2008), home visitors review videotapes made of mothers and infants interacting in order to encourage self-reflection regarding parenting.

- 2. Providing learning materials such as toys and books: Numerous studies have documented that toys and books facilitate interactions between parents and children (Bradley, 1993; Bradley & Caldwell, 1984; Bradley et al., 1989; Katz, 2001; Tomopoulos et al., 2006). Use of toys and books has also been shown to potentiate effect sizes in home-based parenting programs (Dickinson & Caswell, 2007). Examples of programs successfully using this strategy include ROR and PCHP.
- 3. Encouraging self-reflection: A significant body of research beginning in the 1990s documented the usefulness of videotaping with self-reflection to enhance parent-child interaction and infant mental health outcomes. VIP builds in part on programs using this technique, including Interaction Guidance (McDonough, 1995), Steps Toward Effective, Enjoyable Parenting (Erickson & Egeland, 1999), and Partners in Parenting Education (Kubicek, 1996). Examples of more recent programs are PALS (see above) and Family Check

Up (Dishion et al., 2008). In the latter, home visitors assess families and provide guidance based on review of videotaped interactions.

4. Building a relationship with an interventionist: The VIP curriculum is relationship-based, with an interventionist building a caring, trusting relationship with families (Barnard 1998; Erickson, Endersbe, & Simon, 1999; Foley & Hochman, 1998; Pharis & Levin, 1991). This strategy has been effectively used by many programs with similar goals, including PCHP, PALS, Healthy Steps (Minkovitz et al., 2003), and the Nurse-Family Partnership (Olds, Kitzman, Cole, & Robinson, 1997; Olds et al., 2007). Touchpoints, a pediatric primary care intervention to enhance child health outcomes, is built on the relationship between the physician and family (Stadtler, O'Brien, & Hornstein, 1995)

#### VIP Conceptual Model

Figure 1 shows the conceptual model for how health care parenting interventions such as VIP are thought to impact school readiness. To the extent such interventions can enhance responsive parenting, direct impacts can be hypothesized to take place on two critical school readiness domains, academic-cognitive (e.g., literacy, math) and social-emotional (e.g., externalizing behaviors, social competence), both of which have been shown to predict long-term educational trajectories (Duncan et al., 2007; La Paro et al., 2002; Lin, Lawrence, & Gorrell, 2003; National Early Literacy Panel, 2009; Rimm-Kaufman & Pianta, 2000). In addition, indirect impacts can be hypothesized to result from enhanced self-regulation (e.g., executive functions, sustained attention, emotional

regulation), which has been shown to play a critical role in both academic–cognitive and social–emotional outcomes (Bierman, Nix, Greenberg, Blair, & Domitrovich, 2008; Blair, 2002; Blair & Diamond, 2008; Blair & Razza, 2007; Carlson, Mandell, & Williams, 2004; Cole, Martin, & Dennis, 2004; Kochanska, Coy, & Murray, 2001; NICHD Early Child Care Research Network, 2005b; Raver, 2004; Riggs, Blair, & Greenberg, 2003; Ursache, Blair, & Raver, 2012;).

#### The VIP Curriculum

VIP is based in the pediatric primary care clinic and takes place on days of routine pediatric appointments. Either before or following seeing the health care provider, the family meets with an interventionist in one-on-one sessions lasting approximately 30 minutes. At each session, the curriculum targets pretend play, shared reading, and daily routines as opportunities for the parent to engage the child verbally, promote cognitive–language and affective–emotional responsivity, and scaffold development. The curriculum is delivered and reinforced at each visit through three components:

#### a. Videotape made of parent and child

**interacting:** This is the core component of VIP. Videotapes of parents and children are created and viewed to reinforce interactional strengths and promote self-reflection regarding responsive parenting. A 5–10 minute video is created of dyads engaging in activities suggested by the interventionist using a developmentally appropriate learning material, as described on the next page. The video is then watched together by the parent and interventionist, who together make observations about the parent's interactions with the child. During video review,



Figure 1. Model for Health Care Intervention Impacts on School Readiness

the interventionist reinforces positive behaviors reflecting responsive parenting and provides strategies for the parent to engage the child in play and shared reading. The interventionist also notes any missed opportunities for interaction. A copy of the video is given to the parent to take home and review, in order to facilitate implementation of strategies and activities at home as well as to watch together with family members. Many parents have brought the video back so that it can be added to on the next visit, suggesting that they place a high value on this aspect of the program.

- b. **Provision of learning materials:** Developmentally appropriate toys and books are given to families at each visit. These learning materials were selected to promote play, verbal engagement, and emergent literacy. At each visit, the interventionist provides a range of examples of activities and ways to interact via modeling with the toy or book, which the parent can then try in the course of the videotaped interaction.
- c. **Pamphlets:** Messages are reinforced by a written, visit-specific pamphlet addressing development and behavior that the interventionist reviews with the parent. Each pamphlet includes suggestions for interacting with the child through play and shared reading. An important component

of each pamphlet is space for the parent to write down observations about the child and plans for activities. The interventionist encourages the parent to show the pamphlet to the pediatric provider, so that the provider can further reinforce messages.

#### Extension of VIP Into the Preschool Period

VIP was originally developed as a birth-to-3-year-old intervention (VIP 0-3), allowing providers to take advantage of the many wellchild visits that are recommended during this period. However, the primary care platform continues to have significant potential for promotion of parent-child interaction during the 3-to-5-year-old period. In particular, for VIP, all of the advantages of the birth-to-3year-old period are retained: First, continued integration within health care provides an ongoing opportunity for population-wide impact at low cost. Second, the relationships between parent, child, and interventionist developed during VIP 0-3 increase the likelihood of ongoing participation in the program. Third, development of enhanced patterns of play and shared reading during VIP 0-3 becomes a solid foundation for continued learning during the preschool period. Although a lower frequency of routine visits during the 3-5-year-old period represents a potential barrier, families frequently have additional

visits for medical conditions that are prevalent in low-SES children (e.g., asthma, obesity). For example, many 3–5–year-olds at our institution have two to three primary care visits per year.

In addition, evidence suggests that interventions that target responsive parenting during both the infant and toddler-preschool periods can have additive and specific impacts on child development (Landry et al., 2006; Landry, Smith, Swank, Assek, & Vellet, 2001), and that responsive parenting has impacts on children's school achievement above and beyond that of preschool and kindergarten (Rimm-Kaufman et al., 2003; Senechal, 2006; Senechal & LeFevre, 2002; ). Given the potential for increased impacts on child outcomes and the continued potential of the pediatric primary care platform to promote parentchild interaction during the 3-5-year-old period, we developed a preschool component to VIP. This component (VIP 3-5) begins at 3 years old and ends at 5 years old. The visit frequency is maintained at four per year, with nine sessions over this period.

#### VIP 3–5: Enhanced School Readiness Strategies

Figure 2 summarizes the conceptual model for VIP 3–5, including specific parent–child behaviors that are designed to target specific aspects of school readiness. The goal in developing VIP 3–5 was to build upon VIP o–3 existing strategies while incorporating



By leveraging existing health care infrastructure and travel to pediatric visits, health care interventions have reduced costs compared to home visiting programs.

additional strategies to specifically impact school readiness and early school achievement. As with VIP 0-3, VIP 3-5 targeted outcomes related to three domains important for preparing preschool children for entrance into formal education: academic-cognitive, social-emotional, and self-regulation. To promote academic-cognitive skills, we adapted strategies shown to be effective in promoting oral language; alphabet knowledge; and concepts about print, writing, and phonological awareness (National Early Literacy Panel, 2009; Whitehurst & Lonigan, 1998). These strategies were based on two researchbased curricula: Houghton Mifflin Pre-K (Bredekamp, Morrow, & Pikulski, 2006; Morrow, 2007, 2009) and Opening the World of Learning (Ashe, Reed, Dickinson, Morse, & Wilson, 2009; Schickedanz, Dickinson & Charlotte-Mecklenburg Schools, 2005). We also adapted strategies based on two programs documented to impact cognitive and socialemotional outcomes in part through targeting self-regulation: (a) Head Start REDI - P (Parent) Home Visiting Program (Bierman, Rhule, & Gest, 2008), which integrates elements of PATHS-Preschool, including language-based strategies (Bierman et al., 2008; Domitrovich, Cortes, & Greenberg, 2007; Riggs, Greenberg, & Kusché, 2006), and (b) Tools of the Mind (Bodrova & Leong, 2006), an innovative Vygotskian preschool curriculum including a focus on pretend play (Barnett, Yarosz, Thomas, & Hornbeck, 2006; Diamond, Barnett, Thomas, & Munro, 2007).

Two key aspects of VIP 3–5 which represent enhancements for the preschool period are as follows:

1. Explicit development of stories for use in pretend play: Each VIP visit during the 3–5-year-old period has a theme, and a toy, book, and writing material provided for that visit can be used to plan a story that builds on that theme. For example, the 36-month visit theme is going to the grocery store, and includes: a book about going to the store, toy food, a shopping basket, and a pad to make a shopping list together. A plan for a story that builds on that visit's theme and that can be integrated into pretend play is developed by the parent and written out on the pamphlet (often with the help of the interventionist). When possible, stories develop directly from the book that is provided. In another example, the 45-month book is about going to school, and the materials for that visit support development of a story about going to school that can be integrated into pretend play.

2. Specific strategies built into play and shared reading that target the three school-readiness outcomes: Strategies that target self-regulation include planning together the pretend story to follow (executive functions), extending stories over time and over sessions of play (sustained attention), and labeling emotions and taking turns (emotional regulation). Strategies that target academic–cognitive outcomes include verbal interactions, interactive reading, and incorporating writing into play with an emergent literacy material that is provided at each visit. For example, at 36 months old, the child can scribble a shopping list on the provided pad, then pretend to read it while pretending to buy items at the grocery store. Strategies that target social-emotional outcomes include talking about feelings using story books or pretend characters.

#### **VIP Research**

IP 0–3 HAS been studied in two randomized controlled trials taking place at New York University School of Medicine—Bellevue Hospital Center, an urban public hospital in New York City serving low-SES, primarily immigrant families. Results from these studies have shown that VIP 0–3 leads to enhanced responsive parenting and child development.

Table 1: Summary of Published Video Interaction Project (VIP) Impacts on Responsive
Parenting and Child Development

Responsive Parenting	• Increased cognitive stimulation in the home (StimQ) from 6 to 33 months old:
	-Overall scale 0.5-0.6 <i>SD</i> ; teaching activities 0.5 <i>SD</i> ; verbal interactions 0.4-0.5 <i>SD</i> ; reading 0.3 <i>SD</i>
	• Increased maternal child-directed language and verbal responsivity at 14 and 24 months old (videotaped play, coded using Caregiver-Child Interaction Rating Scale; Tamis-LeMonda & Spellmann, 2000):
	-0.7 SD; 50% increase in responses to child's vocalizations
	• Reduced parenting stress at 33 months old (Parenting Stress Index—Short Form; Abidin, 1990):
	-0.25-0.3 <i>SD</i>
Child Development	• Improved cognitive development at 2–3 years old (Bayley Mental Development Index; Bayley, 1993):
	-Overall sample: Increased normal development (VIP 63.5% vs. control 44.4%); reduced delay (VIP 1.9% vs. control 6.7%)
	<ul> <li>Mothers with 7th–11th grade education: 0.4–0.7 SD increase in mean score</li> </ul>
	Improved language development at 2-3 years old (Pre-
	school Language Scale–3; Zimmerman, Steiner, & Pond, 1992):
	-Overall sample: Reduced delay: VIP 9.8% vs. control 33.3%
	-Mothers with 7th-11th grade education: U.4 SD increase in mean expressive language
	Reduced early intervention eligibility:
	–Mothers with 7th–11th grade education: 50% reduction at 2 years old (25% vs. 53%). <sup>t</sup>
	• Improved child behavior at 2–3 years old and in 1st grade (Child Behavior Checklist; Achenbach & Rescorla, 2000):
	-0.3 <i>SD</i> <sup>t</sup>
	• Increased IQ in 1st grade (Wechsler Intelligence Scale for Children; Wechsler, 1991):
	-Reduced rate of IQ < 85 (VIP 19% vs. control 33%)
	• Increased early word reading in 1st grade (Woodcock- Johnson Battery III; Mather & Woodcock, 2001):
	-0.4 <i>SD</i> <sup>t</sup>

Note: All findings statistically significant with p < .05 or lower except as indicated with a <sup>t</sup>, representing p < 0.15.

As shown in Table 1, VIP 0-3 had significant impacts on cognitive stimulation in the home as assessed by StimQ, a parent report measure developed and validated by members of the BELLE project research team that measures the quantity and quality of reading and teaching activities, verbal interactions, and provision of learning materials in the home (Dreyer, Mendelsohn, & Tamis-LeMonda, 1996, 2009). Enhanced cognitive stimulation for families in the VIP group compared to the control group were seen as early as 6 months old and as late as 33 months old (Mendelsohn, Huberman et al., 2011; Mendelsohn et al., 2007). Increased maternal verbal responsivity was also found based on microanalytic coding of videotaped interactions of mother-child free play (Mendelsohn et al., 2004). There was a 50% increase in mothers' responses to their child's vocalizations for families in the VIP group compared to families in the control group. VIP also led to a decrease in parenting stress at 33 months, as assessed by the Parenting Stress Index—Short Form (Mendelsohn et al., 2007).

In addition, VIP 0–3 was associated with enhanced child cognitive, language, and social–emotional development through 33 months old, and with increased IQ, enhanced early literacy achievement, and reduced behavior problem scores in first grade (Forrest et al., 2008; Mendelsohn, Dreyer, Brockmeyer, Berkule-Silberman, & Morrow, 2011; Mendelsohn et al., 2005; Mendelsohn et al. 2007). While many of these findings were present for the sample as a whole, effect sizes have generally been greatest for children whose mothers did not have extremely low education and literacy (i.e., education that was not less than 7th–9th grade).

For the preschool extension of VIP into the 3-to-5-year-old period, children have been rerandomized at 36 months old and reassigned to participate in either the VIP 3–5 or control group. This has resulted in 25% of the cohort receiving both VIP 0-3 and VIP 3-5, 25% receiving only VIP 0-3, 25% receiving only VIP 3-5 and 25% being controls for the entire course of this study. Assessments are in progress at 54 months old (prior to kindergarten entry) and at 1st grade in three domains: academic-cognitive, social-emotional, and self-regulation. The study design will allow the assessment of important questions regarding the longterm impact of VIP 0-3, the unique and additive impact of VIP 3-5, the timing and dose of VIP intervention needed to most effectively impact developmental outcomes and school readiness, and the overall effectiveness of a parenting intervention implemented in pediatric primary care in reducing SES-related disparities.

#### Implications

BELLE PROJECT FINDINGS strongly support the role of pediatric primary care parenting intervention programs during the first 3 years for reducing poverty-related disparities in early child development and school readiness. The combination of low cost, potential for universal dissemination, and evidence of clinically important impact resulting from the VIP suggest that this approach may be useful in expanding upon the ROR model. Current research into VIP 3–5 will provide evidence regarding efficacy of this intervention for children older than 3 years.

While effect sizes due to VIP 0-3 have been modest (0.3 to 0.5), they are remarkable considering the low cost of the program compared to home-visiting and preschool programs. There are several explanations for findings documenting VIP impacts despite low intensity and cost. First, the placement of this program within pediatric health care is an advantage, given the frequency of visits beginning in early infancy, an existing familyprovider relationship on which to build, and the potential for building on existing anticipatory guidance strategies as well as proven programs such as ROR. Second, VIP provides targeted strategies to enhance parent-child interactions associated with development and school readiness, resulting in impacts in specific domains. Third, VIP has been developed as a "translational" project, building on current knowledge in basic and clinical research performed in developmental psychology and educational science.

In conclusion, we have provided evidence that pediatric primary care-based intervention can enhance early developmental and school readiness outcomes for at-risk young children. Our results suggest that increasing intensity through videotaping with feedback can lead to benefits over and above those of ROR. Additional work will be needed to better understand impacts on long-term educational trajectories as well as generalizability across low-SES populations.

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At 36 months old, the child can scribble a shopping list on the provided pad, then pretend to read it while pretending to buy items at the grocery store.

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# Why Should I Read to My Baby?

### The Importance of Early Literacy

### PAMELA C. HIGH

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arly relationships mold young brains and provide the foundation for lifelong development. When parents read, talk, and sing with their infants and toddlers, optimal connections are made and strengthened in young brains. These connections build language, literacy, and socialemotional skills at a critical time in a child's development and secure the bond between parent and child (Center on the Developing Child, 2013; Institute of Medicine & National Research Council, 2012; National Research Council & Institute of Medicine, 2000). A focus on the importance of early experiences in setting a young child's life course trajectory was recently emphasized by the American Academy of Pediatrics (AAP) when Early Brain and Child Development was made a national strategic priority. Pediatricians are using their unique position as trusted allies in the care of young children to promote early relationships and early learning. They are encouraging parents to spend time with their children, every day if possible, starting in early infancy, reading aloud and talking about the characters and stories they read together.

#### Literacy and School Readiness

NE OF THE most effective means of promoting school readiness is to expose children to many words and early literacy skills through reading together during early childhood (High et al., 2008). This is important because many children reach kindergarten unprepared to succeed. By the end of third grade, almost two thirds of American children have not achieved reading proficiency and more than a third of America's fourth graders read at levels so low they cannot complete their schoolwork successfully (Lee, Grigg, & Donahue, 2007). Almost three quarters of children who perform poorly in reading in third grade continue to do so in high school (Fletcher & Lyon, 1998). Thus early reading success has become a key predictor of high school graduation and economic success in our increasingly technologic society (National Institute for Literacy, 2008; National Survey of Children's Health, 2011–2012).

A national survey of parents in 2011– 2012 (National Survey of Children's Health 2011–2012) identified that fewer than half of American children 5 years old and younger were read to daily at home. Among lowincome families, this fell to only 1 in 3 children experiencing these daily enriching experiences with their family members. However, even when children were from advantaged families living above 400% of the nation's poverty level, only 6 in 10 children 5 years and younger enjoyed daily reading activities within the context of their families. These proportions have not changed over the past 8 years, despite attempts to heighten awareness

#### Abstract

Early Brain and Child Development as a strategic priority of the American Academy of Pediatrics recognizes that early literacy and language skills build a strong foundation for healthy development and academic success. Promoting early literacy in the context of pediatric primary care supports early brain development and positive, nurturing relationships. This article explores the importance of early literacy to later development and how health care providers can support language and literacy in the pediatric setting.



Pediatricians are encouraging parents to spend time with their children, every day if possible, starting in early infancy, reading aloud and talking about the characters and stories they read together.

over this time of the importance of early experiences on early brain development. There are gaps in parents' understanding of the importance of these early years and early experiences. There are also many competing activities, in particular solitary games and viewing opportunities offered by electronic media, which may be replacing more intimate parent-child experiences such as reading aloud.

The mechanism by which early reading promotes academic readiness is likely through enhancing young children's language skills and their social and emotional development. When socioeconomic status and parental education has been controlled, the literacy quality of a child's home has been found to predict their language skill (National Institute for Literacy, 2008; Raz & Bryant, 1990). Earlier age of starting to read aloud has been associated with better preschool language development and more interest in reading (Payne, Whitehurst, & Angell, 1994). Reading aloud exposes young children to richer language and more complex syntax. Play and early chats about books stimulate parent-child interactions. These interactions serve to build nurturing relationships which are essential to support healthy trajectories across all areas of early child development (Tomopoulos et al., 2006).

The classic studies of early child development by Hart and Risley (1995) found large variability in the language environments of 1- and 2-year-olds. Children from talkative families were exposed to as many as 30 million more words before they entered kindergarten than children from taciturn families. While the amount of "business talk" (e.g., come here, sit down, put your shoes on) was similar between families, it was the "nonbusiness talk"-the extra chit chat, retelling, praise, and questions-that varied the most. The amount of "non-business talk" children were exposed to as toddlers 12-36 months old predicted well over half of the variability in their IQs measured at 3 years old and their vocabulary size measured at 8 or 9 years old. Reading stories aloud provides ample opportunity for young families to engage in these kinds of important "non-business" conversations.

#### Promoting Literacy Through Pediatric Care

OR ALMOST 20 years, pediatricians have been encouraging parents to read with their young children using a model that is called Reach Out and Read. The Reach Out and Read model was developed in a pediatric practice serving high-risk low-income children and consists of three major components: (a) providing advice and encouragement about the importance of reading daily with children; (b) modeling how to read with young children, often by volunteers in the waiting room, but also by pediatricians and staff; and (c) giving children a high-quality, developmentally and culturally appropriate new book to take home with them and read with their parents and siblings. This intervention is provided at each health supervision visit from 6 months through 5 years old. The practice of incorporating reading into a health supervision visit provides an opportunity for pediatricians to conduct developmental surveillance and use the parent-child interaction with a book as a method for a qualitative assessment of the dyad's relational health. The model has been widely studied and has been found to improve vocabulary in toddlers (High, LeGasse, Becker, Ahlgren, & Gardner, 2000), in preschoolers (Mendelsohn et al., 2001; Sharif, Reiber, & Ozuah, 2002) and in Hispanic families (Golova, Alario, Vivier, Rodriguez, & High, 1999). Universally, participating parents report more positive attitudes about the importance of books and reading with their young children and their pleasure with this activity (Golova et al., 1999; High et al., 2000; Mendelsohn et al., 2001; Needlman, Toker, Dreyer, Klass, & Mendelsohn, 2005; Sharif et al., 2002; Silverstein, Iverson, & Lozano, 2002). The model has been adopted by more than 4,700 pediatric sites serving children at economic risk and has been incorporated into the training of the majority of pediatric residents in the U.S.

The AAP has also encouraged early literacy promotion by the development of their literacy toolkit (AAP, 2013) which has information for parents and professionals in both English and Spanish. Included are handouts for parents in both English and Spanish keyed to children's ages and developmental levels which are written at a fifth grade reading level for individuals with limited literacy themselves. These handouts explain why parents should read with their babies, what children at a particular age can be expected to do with a book, and how parents can incorporate books and reading together into their daily play and routines. The handouts are aimed at helping parents to build their child's language and early literacy development, to enhance children's curiosity and motivation to learn, and even to promote healthy sleep habits. The toolkit suggests book titles by developmental level as well as by topic. The toolkit includes links to videos that offer tips for parents on how to read with infants and toddlers, as well as links to library and literacy-related resources and to handouts for parents in many languages. There are also links to many websites that offer a wealth of literacy-promoting activities that can be enjoyed at home, including ones provided by the U.S. Department of Education, Reading Rockets, Colorin Colorado (Spanish/English bilingual), and Get Ready to Read.

In their 2008 technical report on School Readiness (High et al., 2008) the AAP identified "5 R's" of early childhood education for pediatricians to encourage in the pediatric medical home. These are:

- Reading together as a daily fun family activity;
- 2. **Rhyming**, playing, talking, singing, and cuddling together throughout the day;
- 3. **Routines** and regular times for meals, play, and sleeping, which help children understand and anticipate what they can expect and what is expected from them;
- 4. Rewards for everyday successes, especially for effort toward worthwhile goals like helping; parents should appreciate that their recognition and praise is a very potent reward for their young child; and
- 5. **Relationships** that are reciprocal, warm, nurturing, purposeful, and enduring are the very foundation of healthy early brain and child development.

Early childhood is a time when connections in a young child's developing brain are being formed and fortified at a dizzying pace. Parents and other caregivers have the power and opportunity to shape developing young brains through their everyday experiences with their children. Healthy developmental trajectories are forged by positive experiences such as those described by the "5 Rs" of early childhood education. Unhealthy patterns can be reinforced by exposure to stresses that are chronic, toxic, and unrelenting (AAP, 2012). Starting to read together when children are infants, as a daily routine, perhaps at bedtime to encourage calm and closeness, is one powerful way to create cherished family rituals that will support healthy life course trajectories. This can become the best 20 minutes in the day for both parents and children.

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Solitary games and viewing opportunities offered by electronic media may be replacing more intimate parent-child experiences such as reading aloud.

American Academy of Pediatrics' Early Brain and Child Development Leadership Workgroup. Dr. High's interests are in mentorship and medical education in developmental and behavioral pediatrics focusing on early childhood and in interdisciplinary collaboration.

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# The Safe Environment for Every Kid (SEEK) Model

Helping Promote Children's Health, Development, and Safety

HOWARD DUBOWITZ University of Maryland School of Medicine

hild maltreatment (CM) is an immense problem—more than 3.3 million reports involving about 6 million U.S. children are made to Child Protective Services (CPS) each year (U.S. Department of Health and Human Services, 2013). Maltreated children are at risk for much shortand long-term harm, including developmental/learning, social, and physical and mental health problems. These harms may persist into adulthood, manifesting in an array of problems decades later. In addition to the human costs, society is paying dearly for this problem; the average lifetime cost per victim of nonfatal CM is an estimated \$210,012 (Fang, Brown, Florence, & Mercy, 2012).

The response of the health care system to CM can be viewed in the context of an important shift in the field of pediatrics. Haggerty and colleagues (Haggerty, Roghmann, & Pless, 1975) described the "new morbidity." Advances in antibiotics, nutrition, and immunizations dramatically changed the landscape of child health in the U.S. This allowed attention to be directed to problems such as the impact on children of divorce and parental substance abuse, and child abuse and neglect. This had implications for pediatric practice, with new attention to such psychosocial problems facing many families. Many pediatricians, however, felt that they had neither the knowledge nor the skills to address these problems. In response, the American Academy of Pediatrics led a national effort, "Bright Futures," to develop practice recommendations, including consideration of

the child's critical environment in the home and family (Green, 1994).

In keeping with this recent orientation, my colleagues and I sought a practical approach to further enhance pediatric primary care and make it more responsive to the needs of many children and families. The Safe Environment for Every Kid (SEEK) model was developed to help practitioners identify and address targeted risk factors for CM in families with young children. In this way, SEEK aims to strengthen families, support parents, and thereby promote children's health, development, and safety—and help prevent CM.

Why pediatric primary care? Primary care, provided by pediatricians, family medicine physicians, and nurse practitioners, offers a valuable opportunity for several reasons. There is an existing system of health care; most children have multiple checkups, especially in the first 5 years. The focus is on prevention and the early identification of problems. Children's safety has long been a concern. SEEK extends the safety paradigm from smoke alarms and car seats to include other hazards in the environment, such as parental substance abuse (i.e., social toxins). There's long been the understanding that it

#### Abstract

**Child maltreatment affects millions** of children each year. Health care providers are increasingly called upon to address such psychosocial problems facing many families. In this article, the authors describe a practical approach to further enhance pediatric primary care and make it more responsive to the needs of children and families. The Safe Environment for Every Kid (SEEK) model was developed to help practitioners identify and address targeted risk factors for child maltreatment in families with young children. SEEK aims to strengthen families, support parents, and thereby promote children's health, development, and safety.



Advances in antibiotics, nutrition, and immunizations dramatically changed the landscape of child health in the U.S.

is not sufficient for health professionals to focus narrowly on just the child. Attention also needs to be paid to the home and family environment that naturally influence children's health and development. An advantage of the health care system is that it does not have the stigma often associated with child welfare and mental health. And, there is usually a good relationship between a child health professional and parents; this offers these professionals an excellent opportunity to learn about the family and help address identified problems. Arguably, with such an opportunity there is a responsibility to help.

#### Targeted Risk Factors

My colleagues and I prioritized several risk factors associated with child abuse and neglect: parental depression, major parental stress, substance abuse, intimate partner (or domestic) violence, food insecurity, and harsh punishment. We focused on problems for which resources were generally available (e.g., drug treatment), and opted not to include other problems, such as the need for low-income housing, for which resources are usually scarce. We also did not consider child sexual abuse, which involves rather different issues. Thus, the problems targeted by SEEK are hardly all that families confront. Nevertheless, addressing these pervasive problems should still significantly help many families, without overwhelming health professionals.

#### **Protective Factors**

It's become increasingly clear that focusing only on risk factors is an impoverished model. Strengths and protective factors that help counter the impact of risk factors also need to be identified; these offer a valuable handle to work with. For example, pointing out to a parent how much they love their child and that getting help for depression will also benefit their child illustrates the use of a protective factor—the parent's wish for the child to be healthy. The health professional also can be considered a protective factor—by conveying empathy and an interest in helping. In such ways, the SEEK model incorporates the use of protective factors to intervene effectively. What exactly is the SEEK model?

#### The SEEK Model

HE CORE COMPONENTS of the SEEK model include:

- 1. Training child health primary care professionals to briefly assess and help address targeted psychosocial problems.
  - It's important that primary care professionals are adequately prepared to address the problems, such as parental depression. Many have not been trained in such areas.
  - The principles of motivational interviewing are incorporated to help engage parents. In contrast to the traditional hierarchical approach in medicine with the "wise" physician prescribing treatment, motivational interviewing begins with clarifying the parent's view of an issue. Then, guided by this understanding, the professional engages the parent in jointly developing a plan.

- Professionals are encouraged to also identify and use families' strengths and resources.
- SEEK offers online training modules on each of the targeted problems. There are also two modules primarily for mental health professionals in primary care settings. Each module includes a brief video and supplemental materials.

#### 2. The SEEK Parent Screening Questionnaire (SEEK PSQ) offers a practical way to systematically screen for the targeted problems.

- My colleagues and I developed the SEEK PSQ for parents to complete, voluntarily, before selected well-child visits. Parents can do so while waiting and then give the PSQ to the health professional at the start of the checkup. The PSQ has 15 questions, on one side of one page, and a "yes/no" format that is userfriendly—for parents and professionals. It takes about 3 minutes to complete.
- One challenge is eliciting "socially undesirable" information, such as substance abuse, that a parent may be embarrassed disclosing. To help address this, the PSQ is introduced by: "Dear Parent or Caregiver: Being a parent is not always easy. We want to help families have a safe environment for kids. So, we're asking everyone these questions. They are about problems that affect many families. If there's a problem, we'll try to help." Building on the longstanding concern with safety is helpful; it's familiar to both professionals and parents. The empathic tone is naturally important. And, clarifying that one is not targeting specific parents should pre-empt that possible concern.
- The SEEK PSQ is designed to screen not diagnose—the targeted psychosocial problems. This is an important distinction.
- The SEEK PSQ is completed at selected checkups, such as at the 2-, 9-, and 15-month visits, and the 2-, 3-, 4-, and 5-year visits.
- The current SEEK PSQ is based on a careful evaluation of findings from two large studies (Dubowitz et al., 2007; Dubowitz, Prescott, Feigelman, Lane, & Kim, 2008; Feigelman, Dubowitz, Lane, & Kim, 2009; Kim, Dubowitz, Hudson-Martin, & Lane, 2008; Lane et al., 2007).
- The PSQ can be administered electronically with parents completing the PSQ online in advance of a visit. Efforts are underway to develop online decision support to help clinicians assess and

address identified problems, and document what transpired.

- The SEEK PSQ is available in English, Chinese, and Spanish.
- **3. The REAP approach.** To help clinicians, my colleagues and I developed the Reflect–Empathize –Assess–Plan (REAP) approach to address problems identified by the SEEK PSQ.
  - **Reflect.** The professional briefly reflects back what the parent disclosed on the SEEK PSQ ("It looks like you've been feeling down lately"). This conveys acknowledgment of what the parent has shared and that it's not the clinician's assessment.
  - Empathize. A brief empathic statement conveys caring and helps strengthen the connection for intervening effectively (e.g., "It must be hard on you, and on your kids, feeling this way"). By mentioning the children, one also signals the likely impact on them, too.
  - Assess. The health professional has mostly a triage role. Thus the scope of a brief assessment is to characterize the nature of the problem, what help may already be in place, a parent's interest in help, and possible barriers to getting help. Priority questions and algorithms help clinicians with these brief assessments. Those in family medicine, however, may play a broader role.
  - Plan. SEEK offers ways to engage parents through motivational interviewing and planning the intervention, together with the parent. Some parents may be reluctant to address, for example, their substance abuse. Nevertheless, the health professional has hopefully sowed a seed, conveying the importance of the problem and an interest in helping. These parents may be willing to engage at a later time.
- 4. Ideally, a **mental health professional** is available in the primary care setting to help assess and briefly address problems and facilitate referrals to community resources.
  - In two randomized controlled trials, health professionals and parents had discretion about whether to involve a social worker. Some health professionals preferred to do much of this work themselves, given their relationship with the family. Some parents may have preferred talking with their pediatrician, rather than a social worker. When involved, the social worker tailored her approach



A good relationship between a child health professional and parents offers professionals an excellent opportunity to learn about the family and help address identified problems.

to meet the needs of individual parents, occasionally provided crisis intervention, but did not engage in extended therapy. Much of this was done by phone.

- Many pediatric settings, however, do not have a mental health professional. This role can mostly be played by a physician or nurse practitioner, with office staff facilitating referrals. The SEEK training helps prepare professionals to do this.
- In developing SEEK my colleagues and I were very practical, recognizing the time constraints in a busy practice. SEEK is therefore premised on a skilled professional playing a pivotal role—in a strategic few minutes. For example, by identifying a parent's possible depression, the professional can point out how that makes it hard to be a good parent, and that many parents are helped by counseling. Motivating the parent to engage in an evaluation and facilitating a referral may lead to treatment.

#### 5. SEEK Parent Handouts

• Relatively simple, brief Parent Handouts address the targeted problems, and offer a useful adjunct to the clinician's advice. These SEEK Handouts provide basic information in a user-friendly way and list national hotlines and websites for organizations with good resources for parents. There is space to customize these for a specific practice and to include information on local resources.

#### The Evidence Supporting SEEK

wo LARGE RANDOMIZED controlled trials have been conducted—the first in pediatric resident continuity/ training clinics serving a very low-income, mostly African American, urban population, the second in 18 suburban private pediatric practices serving a relatively low-risk, middle-income, mostly white population. The findings have been quite promising.

#### Impact on Health Professionals

The trials aimed to determine whether health professionals trained in and implementing the SEEK model would report improved attitudes, knowledge, comfort, competence, and practice regarding the targeted psychosocial risk factors compared to those providing standard pediatric primary care. They also assessed whether parents in SEEK practices would be more satisfied with their child's doctor or nurse.

In the first study with 95 residents, those implementing SEEK reported greater improvement in their thinking and behavior regarding four of the six targeted problems than did controls, and the improvement was sustained 18 months after the initial training (Feigelman, Dubowitz, Lane, Grube, & Kim, 2011). They were more likely than controls to screen and assess parents for the risk factors. And, parents in the SEEK clinics reported more favorable views of their child's doctor.

The second study involved 105 pediatricians and pediatric nurse practitioners. Compared to controls, health professionals implementing SEEK felt more competent



In contrast to the traditional hierarchical approach in medicine with the "wise" physician prescribing treatment, motivational interviewing begins with clarifying the parent's view of an issue.

and comfortable addressing several targeted problems, and they screened for them more often. These improvements were sustained for up to 36 months (Dubowitz et al., 2011).

#### Impact on Child Maltreatment

In the first study involving 558 families attending university-based, inner city clinics, SEEK children were significantly less likely to be maltreated—measured three ways compared to those receiving standard primary care: fewer CPS reports (13.3% vs. 19.2%), fewer instances of possible medical neglect documented in their medical record as nonadherence (or "non-compliance"; 4.6% vs. 8.4%) or delayed immunizations (3.3% vs. 9.6%), and fewer instances of "severe physical assault" reported by parents (Dubowitz, Feigelman, Lane, & Kim, 2009).

In the second study of 1,119 relatively lowrisk families, initially and after 12 months, SEEK mothers reported less "Psychological Aggression" and fewer instances of "Minor Physical Assault" (mostly corporal punishment) than did controls (Dubowitz, Lane, Semiatin, & Magder, 2012). There were few instances of CM documented in

#### Learn More

THE SAFE ENVIRONMENT FOR EVERY KID (SEEK) www.theinstitute.umaryland.edu/SEEK the children's medical records and few CPS reports in this low-risk sample.

SEEK did not require additional time on average for health professionals to address psychosocial problems (Dubowitz et al., 2012). Given the importance of costrelated assessments in determining how to best allocate limited prevention dollars, my colleagues and I analyzed data from the second SEEK study (Lane, Dubowitz, Frick, Semiatin, & Magder, 2011). SEEK cost \$5.12 per family and \$122 per case of Psychological Aggression or Physical Assault averted. Providing the SEEK model to 100,000 such families would prevent CM in an estimated 4,200 children and could save about \$37 million. Expansion of the SEEK model of pediatric primary care may reduce the medical, mental health, and social service costs associated with CM.

#### Discussion

HE FINDINGS FROM the two trials Γ provide good evidence that the SEEK model of enhanced pediatric primary care may help prevent CM. The findings in the high-risk sample are especially striking-31% fewer CPS reports in the SEEK group compared to controls. And, this was supported by evidence from the children's medical records and by what parents reported. The reduction in CPS reports (13.3% vs. 19.2%) suggests that for every 17 such families receiving the SEEK model of pediatric primary care, one case of abuse or neglect can be prevented. The findings in the second study involving a relatively low-risk population, while less striking, are still quite promising. It should be noted that there are relatively few interventions to prevent CM in middle-income families.

It's noteworthy that Psychological Aggression and Minor Physical Assaults were common even in the low-risk sample. These experiences may not meet legal definitions of CM. Ample evidence, however, indicates that corporal punishment can jeopardize a child's development (Simons & Wurtele, 2010; Zolotar, Theodore, Chang, Berkoff, & Runyan, 2008). Psychological maltreatment (or emotional abuse) is defined by the American Academy of Pediatrics as a repeated pattern of damaging interactions between caregiver and child (Hart et al., 2011; Hibbard, Barlow, MacMillan, & the AAP Committee on Child Abuse and Neglect, 2012); it may be the most damaging of all forms of maltreatment, even though it seldom leads to CPS involvement (Kairys, Johnson, & the Committee on Child Abuse and Neglect, 2002). Clearly, CPS reports reflect only a small fraction of the maltreatment children experience, guided by state laws and policies that focus on relatively egregious circumstances. Arguably,

the definition of CM should be based on scientific evidence of what harms children. It thus seems reasonable to consider the Minor Physical Assaults and Psychological Aggression as CM, although some may instead refer to this as "harsh parenting." In either case, SEEK appears helpful in reducing these experiences.

Given the stronger findings in the very high-risk, urban sample, an important question arises. Should SEEK be implemented only in high-risk settings? While some may argue the evidence justifies prioritizing such families, there is another consideration. Preventing potentially damaging experiences (e.g., Psychological Aggression) in a small percentage of families can still have valuable, far-reaching benefits at a population level; the low-risk sample likely represents a broad swath of American families. Thinking of 75 million children in the U.S., an intervention that results in 5% fewer of them experiencing Psychological Aggression may benefit many children. Also worth considering is that even though some risk factors were rarely reported by low-risk parents (e.g., intimate partner violence), others were quite prevalent (e.g., alcohol abuse-8%). Clearly, the suburbs are hardly immune from such problems. Finally, aside from lowering the rate of CM, helping address prevalent psychosocial problems should help strengthen families; support parents; and promote children's health, development, and safety (Weissman et al., 2006).

SEEK involves a modest yet substantial change in current pediatric primary care. One question is whether many health professionals will modify their practice and implement SEEK. It is encouraging, for example, that 75% of practices approached agreed to participate in the second trial, as did all the health professionals in those practices. Other evidence indicates much interest among pediatricians and nurse practitioners to respond to psychosocial problems facing many families (Hagan, Shaw, & Duncan, 2008). Just as important, parents too appear interested in being helped (Kahn et al., 1999). With such interest, changes to pediatric primary care are clearly possible.

There are challenges. Finding time for training professionals is not easy. The new SEEK online training materials will help. Another challenge is that of adding to the plate of practitioners that is already piled pretty high—much is expected in the regular checkups. In developing SEEK, my colleagues and I were well aware of time constraints. The practice guidance, therefore, prioritizes what information to gather and how to briefly intervene. Assistance from a social worker seemed important, complementing health professionals' efforts to assess and address

identified problems. To limit costs, the social worker in the second study divided her time among seven SEEK practices, while being available to SEEK professionals and parents during regular hours. It was surprising that, despite excellent working relationships, she was underutilized, and, much of her work was by phone. It may be possible to lower costs by having a social worker cover more practices and provide assistance only by phone. Indeed, there is support for the effectiveness of such psychosocial phone interventions (Simon, Von Korff, Rutter, &Wagner, 2000). As suggested earlier, it's also possible that a health professional alone can briefly assess a problem and do the initial planning, with a staff member facilitating a referral. The SEEK training prepares health professionals to play this role.

Another big challenge is how to modify current practice and widely implement SEEK. SEEK appeals to health professionals' interest in providing excellent care and being responsive to children's needs. Some aspects of current practice are rarely useful, such as examining the belly of a healthy 3-year-old, and they could be dropped. This would free up time to address more pressing priorities. Financial incentives would no doubt help, as is the case where screening for developmental problems or parental depression are reimbursed.

How may SEEK have worked? SEEK health professionals had sustained improvements in their attitudes and behavior regarding the targeted psychosocial problems (Dubowitz et al., 2011; Feigelman et al., 2011). For example, screening for depression occurred far more frequently in SEEK practices, and when problems were identified some action almost always followed. After 12 months, SEEK mothers described greater satisfaction with their parenting. There were also encouraging findings regarding intimate partner violence. After 6 months, SEEK mothers in the second study reported fewer physical assaults by them toward their partners and at 12 months by their partners toward them, compared to controls. Other areas were measured, but my colleagues and I were disappointed that there were not significant differences (e.g., no increase in services for alcoholism, no decrease in

The reduction in CPS reports (13.3% vs. 19.2%) suggests that for every 17 families receiving the SEEK model of pediatric primary care, one case of abuse or neglect can be prevented.

depressive symptoms). Finally, changes may have occurred in areas we didn't measure. For example, it's possible that the SEEK intervention in the pediatric office offered parents new insight and support regarding a problem and changed how they behaved toward their child.

#### **Future Directions**

HERE IS GREAT interest and need to find strategies to help prevent CM and to promote children's health, development, and safety. After two rigorous studies, the SEEK model appears promising. There is considerable interest in implementing SEEK. Some may argue the evidence is not enough to justify taking the model to scale. Others think it is adequate and point to many areas of current practice with scant evidence. SEEK does not appear to have negative outcomes, did not involve more professional time, and appears to be cost saving (Lane et al., 2011). It offers a practical model that can substantially enhance pediatric primary care, benefiting many families and children.

The Doris Duke Charitable Foundation has provided funds to disseminate the SEEK model. The model has been recognized as a promising practice to reduce child abuse and neglect by the Agency for Healthcare Research and Quality on their Innovations website, and is included in materials of the American Academy of Pediatrics' Bright Futures<sup>™</sup>.

#### What Is Needed to Implement SEEK

There are a few core ingredients for implementing the SEEK model in a pediatric primary care setting:

- Professional interest to enhance the quality of child health care by helping address prevalent psychosocial problems facing many families.
- At least one physician in a practice to "champion" the project and lead SEEK's implementation.
- At least one staff member such as the office or clinic manager to help lead the effort.
- A commitment to complete the SEEK online training.

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# Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV)

Building Health and Early Development With the Pediatric Family-Centered Medical Home

#### DAVID W. WILLIS

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n the U.S., early childhood communities and child health sectors are joining together to address the earliest foundations of health for young children and their families-foundations that rest in parent-child relationships and the environments within which young children live. These domains are often called the "social determinants of health" and have been the focus of decades of work in early childhood communities and child health care systems (Braveman & Barclay, 2009; Shonkoff, Boyce, & McEwen, 2009). The new science of early childhood calls for policy and practice transformations to address the origins of life-course health and population health disparities by improving early childhood experiences and mitigating toxic stress (Committee on the Psychosocial Aspects of Child and Family Health & Committee on Early Childhood, Adoption, and Dependent Care, 2012; Halfon & Hochstein, 2002; Shonkoff et al., 2012). Breakthrough strategies are calling for the integration and coordination of evidence-based home visiting programs and pediatric family-centered medical homes to improve the health, development, and well-being of the next generation of young children and their families (Toomey, Cheng, & APA-AAP Workgroup on the Family-Centered Medical Home, 2013). *Home visiting* is voluntary program as a community approach for young families in which well-trained professionals (e.g., nurses, social workers, parent educators, or other professionals) meet with at-risk families in their homes, evaluate the families' circumstances and needs, and provide information and guidance related to maternal and child health and development. Home visitors connect families to additional resources and services as necessary to make a real difference in a child's health, development, and ability to learn. The pediatric family-centered medical home has a long-standing tradition of providing children with primary health care that is comprehensive, coordinated, and family-centered, and it seeks to facilitate partnerships among patients, families, clinicians, and community resources and services (Bruner, 2012). The pediatric family-centered medical home delivers comprehensive health care services to all families. In so doing, it ensures children's optimal development and life-course health by being well-coordinated with community services. A patient-centered medical home that is well connected and high functioning can decrease barriers to care, improve family satisfaction, and enhance child and family outcomes (Homer et al., 2008).

#### Abstract

President Obama announced his Early Learning Agenda during his Second Inaugural Address. This announcement has galvanized a special focus on early childhood policy and practices, for the prenatal to 5-year-old period, to improve educational outcomes for America's youth. The emergent science of early childhood development places an emphasis on "one science" for health, education, and social wellbeing and calls for intentional efforts for infants and young children that focus on strengthening the earliest relationships and mitigating effects of toxic stress on life course health and development. Accordingly, innovations in child health reform call for strengthening the pediatric family-centered medical home and for intensive community programs to improve the foundation of health and development. Linking the Affordable Care Act's Maternal. Infant, and Early Childhood Home Visiting programs with the pediatric family-centered medical home provides a unique and breakthrough opportunity for improving child and family outcomes.



Early childhood communities and child health sectors are joining together to address the earliest foundations of health for young children and their families.

Both home visiting and the familycentered medical home are central policy and investment strategies of the Affordable Care Act of 2010 (ACA; White House, 2012) and align with the Institute for Healthcare Improvement's Triple Aim (Berwick, Nolan, & Whittington, 2008), a strategy that calls for health care transformations that improve the patient's experience of care, improve the population's health, and reduce the per capita cost of health care. The implementation of the ACA has brought focus to universal health care access for children, high-quality health care delivery, prevention services, integrated health homes, care coordination, efficient chronic disease management, statelevel innovations, integrated data systems, and emerging returns on investment. Thus, practitioners, advocates, and policy leaders are calling for innovation and co-creation of the early childhood health and development systems for the future through the integration and collaboration of home visiting programs and pediatric family-centered medical homes (American Academy of Pediatrics [AAP] Committee on Community Pediatrics, 2009; Schor, 2007; Toomey et al., 2013).

#### America's Children

ATIONAL SURVEYS IN the U.S. have indicated that 23% of children in the United States live in families below the federal poverty level (The Annie E. Casey Foundation, 2013); only 48% of poor children (compared with 75% of those with moderate to high incomes) are ready for school at 5 years old (Isaacs, 2012); 33% of all students have below-basic skills in fourth grade reading (as measured by the National Assessment of Educational Progress reading test; The Annie E. Casey Foundation, 2012); nationwide, the graduation rate for the class of 2010 was 75%, leaving 25% of students without a high school diploma (Education Weekly, 2013 ); 13% to 20% of children experience a mental health disorder in a given year (Centers for Disease Control and Prevention, 2013). In 2010, more than one third of children and adolescents were overweight or obese (Ogden et al., 2012); and 9.5% of children have chronic asthma (Child and Adolescent Health Measurement Initiative, 2012). Adverse childhood experiences (ACEs) develop early and disrupt the behavioral and educational readiness of even those preschoolers who are enrolled in Head Start; this is also known as "the accumulating ACE burden" (Blodgett, personal communication, June 30, 2012). The health and development disparities of poor, non-White child populations remain unrelenting, despite decades of investments and targeted programs.

In 2007, the United Nations Children's Fund (UNICEF) published the first international resource to address these disparities (UNICEF, 2007). In this publication, UNICEF provided an overview of child well-being indicators of 20 economically advanced nations, with internationally comparable data for the years 2001 through 2003. The United States ranked 20 of 21 tied with the United Kingdom for the lowest ranking. Measurement dimensions of wellbeing included maternal well-being, health, education, and behaviors and risks, with such indicators as infant mortality, educational achievement, obesity, teenage fertility, smoking, alcohol use, fighting, bullying, and self-reported life satisfaction. In April 2013, a second report was released, with data from 2009 and 2010 (UNICEF, 2012). Again, the United States had a low ranking—26 of 29 whereas the United Kingdom ranked 16 of 29, with the Netherlands, Norway, Iceland, Finland, and Sweden ranking 1 through 5, respectively. It is striking to note that during the past decade, the United States has made very little progress on general measures of child well-being.

The early childhood scientific community has now substantiated the critical importance of the early years in building lifelong heath, education capacity, and social-emotional well-being (National Scientific Council on the Developing Child, 2007). The science of early development has found that early experiences are built into children's bodies: Significant adversity (commonly known as toxic stress) can produce physiological disruptions that undermine the body's stress system and affect brain, heart, immune, and metabolic systems, and these physiological disruptions affect lifelong health, mental health, and educational capacities (National Scientific Council on the Developing Child, 2010). The root of health disparities and educational failures lies in the impact of toxic stress on life-course health. The American Academy of Pediatrics has called for "fundamental changes in early childhood policy" and for the child health community to leverage science to mitigate the negative effects of toxic stress on the life course of young children's development and health (Committee on the Psychosocial Aspects of Child and Family Health & Committee on Early Childhood, Adoption, and Dependent Care, 2012, p. e224). Scientific understanding of early child development now speaks of "one science" for building health and early education readiness (National Scientific Council on the Developing Child, 2007). Now is the time for translating this early childhood science into public policy (Shonkoff, 2010).

In January 2013, President Barack Obama announced his Early Learning Agenda during his second inaugural speech and articulated a vision for improved educational achievement for the next generation of children. This vision, he said, can be accomplished by substantial expansion in the investments in home visiting and high-quality early learning environments. Embedded in this national dialogue is the need to recognize the critical importance of building health, stimulating and safe relationships, and high-quality early learning environments that serve as the foundation for educational readiness and the future workforce (The White House, n.d.).

#### Maternal, Infant, and Early Childhood Home Visiting Legislation

N MARCH 23, 2010, President Obama signed into law the Patient Protection and Affordable Care Act (Pub. L. No. 11-148.) including the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program, authorized under the Social Security Act, Title V, Section 511 (42 USC 711; U.S. Department of Health and Human Services, 2012b). This program aims to improve health and developmental outcomes for at-risk children through the implementation of voluntary evidence-based home visiting programs. The MIECHV program is administered by the Health Resources and Services Administration in close collaboration with the Administration for Children and Families, which is the main entity responsible for MIECHV's national program evaluation. This groundbreaking legislation authorized a \$1.5 billion investment over 5 years to states, territories, and tribal organizations with the explicit goal of advancing the field of maternal child health and development, translating science into policy, and demonstrating data collection frameworks to drive quality improvement practices across this country's early childhood communities. In the legislation, at-risk communities are clearly addressed, with a statutory requirement for grantees to perform a statewide needs assessment and to identify at-risk communities with concentrations of poor birth outcomes, poverty, crime, and domestic violence, as well as high rates of high school dropouts, substance abuse, unemployment, and child maltreatment. Grantees generated plans to effectively implement evidence-based home visiting programs in these at-risk communities and built collaborations across early childhood systems, programs, and communities, often building upon the grant activities of the Maternal Child Health Bureau's Early Childhood Comprehensive Systems from the past decade and the more recent activities of early childhood advisory councils, as part of the Head Start Reauthorization Act of 2007 (Administration for Children and Families, n.d.).

The legislation also required that the MIECHV programs develop a plan to collect data so that they could measure progress in each of six benchmark areas and demonstrate quantifiable, measurable improvement in at least four of the benchmark areas at 3 years and all of the benchmarks at 5 years into the grant periods. Each grantee has created a comprehensive evaluation plan for these six benchmarks, selecting from a programmatic set of 35 performance indicator constructs (see box Maternal, Infant, and Early Childhood Home Visiting Program



The American system of child health care services occurs within the pediatric familycentered medical home.

Benchmarks and Constructs). There are growing efforts to create and align national metrics including MIECHV indices and benchmarks state aggregate data, and the metrics of Children's Health Insurance Program Reauthorization Act, as examples. These activities will bring a new level of accountability to raise the standards, quality, and reporting of early childhood programs across the country and provide

#### MATERNAL, INFANT, AND EARLY CHILDHOOD HOME VISITING PROGRAM BENCHMARKS AND CONSTRUCTS

The statute for MIECHV requires that all grantees must gather baseline and improvement data on the following six benchmark areas:

1. Improved maternal and newborn health

Prenatal care; alcohol, tobacco, or illicit drugs; preconception care; interbirth intervals; depression screening; breastfeeding; well-child visits; insurance status

2. Prevention of child injuries; child abuse, neglect, or maltreatment; and reduction of emergency department (ED) visits

Child ED visits; maternal ED visits; injury prevention; child injuries requiring treatment; suspected child maltreatment; substantiated maltreatment; first-time maltreatment

- 3. Improvement in school readiness and achievement
  - *Parental:* Support for learning and development; knowledge of child development; parent-child relationship; emotional well-being;
  - *Child:* Communication level; cognitive skills; positive approach to learning; social behavior and emotional well-being; physical health
- 4. Reduction in crime or domestic violence

Screening for domestic violence; referrals; completed safety plan

- 5. Improvements in family economic self-sufficiency Household income and benefits; employment or education of adults; health insurance
- 6. Improvements in the coordination and referrals for other community resources and supports

Families identified as requiring services; families receiving referrals; memorandums of understanding with community social service agencies; agencies sharing information with home visiting provider; completed referrals

Source: Department of Health and Human Services, 2012

Evidence-based home visiting programs allow providers to engage with families—individually and continuously—beginning prenatally, for 2 to 5 years, depending on the home visiting model.

an opportunity to reach a higher goal of improving population-based health and developmental trajectories for America's young children.

Currently, state and territory MIECHV programs are using 8 of the 14 evidencebased home visiting models that have been approved by the Home Visiting Evidence of Effectiveness Review (2012, October; see box Maternal, Infant, and Early Childhood Home Visiting Program Evidence-Based Home Visiting Models—Evidence of Effectiveness Review; Paulsee, Avellar, Sama Martin, & Del Grosso, 2012). The models chosen by all states and territories vary depending on the populations served and the targeted risks addressed. Seventeen states are implementing only one model, whereas 37 states are implementing multiple models, sometimes with efforts to coordinate universal intake and referral to one particular model, with intentional integrations based on community need. As of July 2013, more than \$698 million has been released through 318 grants to 53 state and territories; three nonprofits serving Florida, North Dakota, and Wyoming; and 25 tribal organizations. Year 1 data has been released: As of September 2012, with less than 1 full year of implementation behind it, the national MIECHV had conducted more than 161,000 home visits to 14,796 high-risk families in 544 communities. MIECHV continues to serve many more families, and grantees will report Year 2 data no later than October 30, 2013.

# Early Childhood Science to Practice

HE MIECHV PROGRAM brings an unprecedented investment that focuses on "building health and development" in early childhood, with special emphasis on the earliest period of development when the foundations for

#### MATERNAL, INFANT, AND EARLY CHILDHOOD HOME VISITING PROGRAM EVIDENCE-BASED HOME VISITING MODELS— EVIDENCE OF EFFECTIVENESS REVIEW

The Home Visiting Evidence of Effectiveness Reviews, conducted by the Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV), has approved to date 14 home visiting models. Of those, the following eight have been selected by the states for their MIECHV activities:

- Healthy Families America (41 states)
- Nurse–Family Partnership (40 states)
- Parents as Teachers (30 states)
- Early Head Start—Home-Based Option (26 states)
- · Home Instruction for Parents of Preschool Youngsters (9 states)
- Healthy Steps (3 states)
- Child FIRST (1 state)
- Family Check-Up (1 state)

## The following models were approved but have not been implemented in any states:

- Early Intervention Programs for Adolescent Mothers
- Play and Learning Strategies—Infant
- Early Start (New Zealand)
- The Oklahoma Community-Based Family Resource and Support Program
- SafeCare Augmented
- Maternal Early Childhood Sustained Home Visiting Programme

Sources: HomeVEE (U.S. Department of Health and Human Services, 2012a); Paulsee, Avellar, Sama Martin, & Del Grosso, 2012

established (Hertzman & Boyce, 2010). The long-term impact of early toxic stress for a pregnant mother or for her vulnerable infant's developing brain has now been well established (Shonkoff et al., 2009, 2012). All domains of health and development are built by those proximal hour-by-hour, dayby-day, interactive experiences early in life with attuned, positive caregivers who are ever present. The summation of these experiences becomes embodied in the expectant neurodevelopment of the right brain, autonomic nervous system, limbic brain, stress regulation, emotional regulation, and immunological systems. MIECHV's home visitors have embraced the science of relational experiences in building early brain development, and these visitors use evidence-based models and innovations that mitigate the risks of toxic stress by establishing intentional activities to ensure maternal health and safety, positive mental health, community engagement and social supports, and the critical parent-child interactions that must be present, attuned, positive, and attentive if the baby is to have healthy development. The nation's MIECHV investment, largely focused on this critical period, "brings this science to the cribside" to improve the foundations for life-course health development, education readiness, and social sturdiness while simultaneously addressing the critical self-sufficiency and

life-course health and development are

#### The Pediatric Family-Centered Medical Home

skill building for vulnerable families.

HE CONCEPT OF the *medical home* was first developed by researchers in the field of pediatrics (Sia, Tonniges, Osterhus, & Taba, 2004). The pediatric family-centered medical home is an approach to providing primary care that (a) facilitates partnerships among patients, physicians, and families and (b) is accessible, continuous, comprehensive, patient- and familycentered, coordinated, compassionate, and culturally effective. The American system of child health care services occurs within the pediatric family-centered medical home, staffed by a variety of providers including pediatricians, family practitioners, physician assistants, nurse practitioners, and other support personnel.

In order to provide guidelines for quality preventative child health care, Bright Futures was created as a national health promotion curriculum overseen by the AAP, with an articulated focus on children's health needs within the context of family and community (Hagan, Shaw, & Duncan, 2008). Bright Futures program administrators established guidelines for preventative services for

young families and their children with a schedule for recommended well-child care visits throughout childhood. In fact, during the first 3 years of life, Bright Futures recommends 14 well-child visits focused on providing immunizations; monitoring and educating families about growth and development; addressing health, illness, behavior, family, and child-rearing questions; and providing anticipatory guidance about an array of health-promoting topics including nutrition, physical activity, safe sleep, safety precautions, parenting, and so forth. These frequent visits provide an important opportunity for the family and child health care provider to develop an ongoing, meaningful relationship with the familyone that is mutually trusting and personal. No other early childhood system touches nearly all young children and their families in the first years of life. This unique opportunity and family-provider relationship is built on the mutual commitment of both parties to ensure the healthy growth and development of the child, with equal focus on the strength and capacity of the family to do so.

## Home Visiting and the Medical Home

N A SIMILAR way, evidence-based home visiting programs allow providers to L engage with families—individually and continuously-beginning prenatally, for 2 to 5 years, depending on the home visiting model. This relationship with families, developed over time, becomes the core strategy upon which the evidence-based models are built. The possibility for synergy between home visiting and the pediatric family-centered medical home, if integrated and coordinated, offers an important innovation for child health reform and a unique opportunity to build on the strengths of each, working together, for the improvement of child and family health (AAP Committee on Community Pediatrics, 2009; Berwick et al., 2008). Yet, just as the pediatric family-centered medical home seeks to coordinate services and provide continuous and comprehensive care, the success of the MIECHV programs rests solely on the degree to which home visitors can access services for families from additional supports and programs within the local early childhood systems.

One of the six statutory benchmarks and goals of the MIECHV program is the successful coordination and referral of families to necessary additional services, programs, and activities that can strengthen families and improve their children's growth and development (see box Maternal, Infant, and Early Childhood Home Visiting Program Benchmarks and Constructs ). Striking, too, is the similarity of goals and efforts of the pediatric family-centered medical home and MIECHV—both of which seek to promote healthy growth and development for children-to strengthen families and parenting practices; to mitigate risks for injury, abuse, and neglect; to promote the foundations of early learning; and to coordinate with other necessary services and programs that meet the needs of children and families. The next step in the evolution of the MIECHV program will be its integration and collaboration with the pediatric family-centered medical homeand the possible benefits of this partnership, as noted by the APA-AAP Policy Statement on Home Visiting and the family-centered medical home (see box Benefits of the Partnership Between Home Visiting and Family-Centered Medical Home; Berwick et al., 2008).

Innovative practices across the country are building on this synergy of home visiting integrated within the medical home. The evidence-based model Healthy Steps has used parent educators and home visiting as an innovative component to pediatric practice for more than a decade, as a way of enhancing parenting skills and child development (Zuckerman, Parker, The possibility now exists that the demonstrated benefits of evidencebased home visiting will be seen as an essential, complementary, synergistic, and necessary team-based services for the pediatric familycentered medical home.

Kaplan-Sanoff, Augustyn, & Barth, 2004). Although invaluable and effective for families and clinicians, the challenge of expanding this model has been the availability of sustainable financing. With MIECHV, more states are expanding the Healthy Steps model into primary care settings, whereas others are exploring ways to link the other MIECHV models with family-centered medical

#### BENEFITS OF THE PARTNERSHIP BETWEEN HOME VISITING and Family-Centered Medical Home

- Sharing information to identify child and family needs, collaborate in educating families, and "refer" to each other
- Assisting families in care coordination
- Facilitating referrals to community resources (e.g., early intervention), medical evaluations (e.g., audiology), and community supports (e.g., parenting groups, nutrition services, social work)
- · Identifying community needs that are important in managing population health
- Assisting transition across multiple settings (e.g., early intervention, health care, education)
- Assisting parents and patients in communicating with family-centered medical home providers and preparing for family-centered medical home visits
- Reinforcing advice and anticipatory guidance given by family-centered medical homes
- · Monitoring of up-to-date immunizations and family-centered medical home visits
- Fostering cultural and linguistic competence for families and patients because home visiting providers see families in their home environment
- Identifying nutrition and living condition needs and performing environmental and safety assessments
- Reinforcing injury prevention strategies
- · Improving identification, treatment, and prevention of parental depression
- Overseeing and assisting provision of complex health care in the homes of children with serious ongoing health conditions and helping to balance the needs of the affected child with those of other family members
- Identifying needs for equipment for children with special needs and for implementing prescribed care in the least disruptive manner
- Educating medical students and residents in the benefits of home visiting services

Source: Berwick et al., 2008



Significant adversity (commonly known as *toxic stress*) can produce physiological disruptions that undermine the body's stress system and affect brain, heart, immune, and metabolic systems.

homes. Twenty-one states are specifically focused on cross-institutional and linkages among their AAP chapters, Early Childhood Comprehensive Systems, and MIECHV programs in hopes of driving innovative opportunities (AAP's Building Bridges Among Health and Early Childhood Systems; Healthy Child Care America, n.d.). For example, some of the MIECHV services in South Carolina are integrated and coordinated with the state's community pediatric health clinics. Other large pediatric practices, such as Goldsboro Pediatrics in North Carolina, have home visiting service options, when needed, that are conveniently housed and dispensed within the clinic. Other practices are seeking to create intentional communications between the pediatric family-centered medical home and its local MIECHV home visiting program, when the two programs both serve families they have in common. Those states with universal intake systems that help them identify families of risk that need services (e.g., Georgia, New Jersey, and Connecticut) often create the referral connections between home visiting services and the familycentered medical home.

This integration with broad partners and stakeholders remains key for both home visiting programs and pediatric family-centered medical homes to address the challenges sometimes formidable—identified in the intimate, critical relationships between infants and their caregivers. For example, MIECHV and the family-centered medical home providers encounter a high incidence of depression, domestic violence, and parents with histories of significant ACEs. In much the same way, home visiting programs must routinely address the frequent issues of depression, domestic violence, and past history of trauma that contributes to the toxic stress impacts on vulnerable infants and young children. Recent reports show that one strategy is demonstrating promising and synergistic benefits: mental health providers' delivery of cognitive behavioral therapy in the home to treat maternal depression that has been identified and supported by home visitors (Ammerman et al., 2011; Tandon, Leis, Mendelson, Perry, & Kemp, 2013). As home visiting services, mental health services, and the pediatric family-centered medical home become integrated and collaborative, there may be new opportunities to reduce the effects of maternal depression and toxic stress on the next generation. The enormous potential to generate even greater improvements in early childhood health and development may expand as these breakthrough practices are further developed and evaluated.

#### Toward the Future

T's A GOOD time for early childhood. President Obama has articulated his second-term early childhood education agenda, and it includes the expansion of various programs to raise the bar for early learning by reforming and expanding Head Start (in particular, Early Head Start), thus boosting the quality of child care and empowering parents through home visiting and parenting education (White House, n.d.). At the same time, the business sector-galvanized by the early childhood program return-on-investment research of Nobel Laureate James Heckman (2006)is building leadership in every state for early childhood programs (e.g., the effort led by Ready Nation, n.d.). Hence, home visiting has growing visibility, acceptance, and importance, not only as essential community program that serves as a foundation for young families with known risks but also as a necessary connector among families, the community, and the pediatric familycentered medical home. There is now growing understanding of critical health foundations for early learning success. The possibility now exists that the demonstrated benefits of evidence-based home visiting will be seen as an essential, complementary, synergistic, and necessary team-based services for the pediatric family-centered medical home. Progress is being made in child health reform, population-based universal intake, perinatal risk identification, and early childhood data integration. As that progress continues, the pressure to intentionally link home visiting with the pediatric familycentered medical home will grow and become an essential-and, possibly, a requiredservice as part of the team approach in the pediatric family-centered medical home. As Medicaid, state health exchanges, and private insurers learn of the return on investment of home visiting to prevent the toxic stress effects on health and brain development, new policies will be created that will allow for sustainable funding to support home visiting as it evolves into a commonly accepted, standard medical intervention.

An urgent call to improve child wellbeing is developing across the United States to ensure a sturdy and well-trained workforce for economic competitiveness (Ready Nation, n.d.). In addition, place-based early childhood initiatives are forming in communities with broad coalitions and stakeholder groups who view the gathering of population and longitudinal data as an essential strategy for collective impact approaches to improve the health, development, and school readiness outcomes of their own community's children (Fine & Mayer, 2008). Home visiting services are required in these initiatives—and they will soon be universal for community building in alignment with the health and development goals of the pediatric family-centered medical home. It is through these innovations, visionary leadership, and accountability that home visiting within pediatric family-centered medical homes will become identified as the key lever that will support the "ladders

of opportunity" and eventually move poor children out of poverty and ensure the future health, well-being, and success of the next generation (White House, n.d.).

**DAVID W. WILLIS**, MD, FAAP, joined the Health Resources and Services Administration's Maternal Child Health Bureau in July 2012 as its director of the Division of Home Visiting and Early Childhood Services. Board-certified in behavioral and developmental pediatrics, he was a clinician for 30 years and a long-standing early childhood leader in Oregon who first founded the Northwest Early Childhood Institute in response to the call to action issued with the release of the groundbreaking book From Neurons to Neighborhoods and became the first medical director of the Artz Center for Developmental Health, a multidisciplinary clinic in Portland. Dr. Willis was a previous Harris Mid-Career Fellow with ZERO TO THREE and served as president of the Oregon Pediatric Society. In Oregon, he helped build early childhood agendas for two governors and helped craft Governor John Kitzhaber's innovative early childhood legislation in 2012. Dr. Willis has provided national leadership by serving on the Executive Committee of the American Academy of Pediatrics (AAP) Section on Early Education and Child Care and by serving as the first Chair of the AAP Board's Early Brain & Child Development Strategic Initiative. In addition, he was an invited member of Dr. Jack Shonkoff's Frontiers for Innovation at Harvard University's Center for the Developing Child before being invited to the Health Resources and Services Administration to assume leadership for home visiting and early childhood systems.

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# Jargon Buster

Given the multidisciplinary nature of our work with infants, toddlers, and families, we often come across words or acronyms that are new or unfamiliar to us. To enhance your reading experience of this issue of *Zero to Three*, we offer a glossary of selected technical words or terms used by the contributing authors in this issue. Please note that these definitions specifically address how these terms are used by the authors in their articles and are not intended to be formal or authoritative definitions.

Phrase	What it means
5 R's of Early Childhood Education	The 5 R's of early childhood education are topics that pediatricians should encourage in the pediatric medical home. These are (a) <b>Reading</b> together as a daily fun family activity; (b) <b>Rhyming</b> , playing, talking, singing, and cuddling together throughout the day; (c) <b>Routines</b> and regular times for meals, play, and sleeping, which help children understand and anticipate what they can expect and what is expected from them; (d) <b>Rewards</b> for everyday successes, especially for effort toward worthwhile goals like helping; parents should appreciate that their recognition and praise is a very potent reward for their young child; and (e) <b>Relationships</b> that are reciprocal, warm, nurturing, purposeful, and enduring are the very foundation of healthy early brain and child development. [Find it in High, page 41]
The Ecobiodevelop- mental Framework	The ecobiodevelopmental framework for the science of pediatrics describes how promoting health and preventing disease involve interplay among personal experiences, environmental influences, and genetic predispositions. The model underscores how early childhood adversity can lead to lifelong impairments in learning, behavior, and both physical and mental health [Find it in Romano, page 23]
Family-Centered Medical Home	A family-centered medical home describes an approach to providing comprehensive primary care. In a family-centered medical home the pediatric care team works in partnership with a child and a child's family to help the family and patient access, coordinate, and understand specialty care, educational services, out-of-home care, family support, and other public and private community services that are important for the overall health of the child and family. [Find it in Kraft, page 16]
The Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV)	The Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV) was authorized by the Affordable Care Act in 2010 and is administered by Health Resources and Services Administration. Funding of \$1.5 billion is earmarked through FY 2014 to provide grants to promote: improved maternal and newborn health; prevention of child injuries, child abuse, neglect, or maltreatment, and reduction of emergency department visits; improvement in school readiness and achievement; reduction in crime or domestic violence; improvements in family economic self-sufficiency; and improvements in the coordination and referrals for other community resources and supports. [Find it in Duby, page 4]
Neurogenesis	Neurogenesis is the process by which neurons are generated in the brain. Studies of laboratory rodents reared in environments with differing levels of stimulation, ranging from relative deprivation to enriched environments high in stimulation, have shown that early exposure to stimulating environments promotes increased brain growth from neurogenesis. [Find it in Luby & Rogers, page 12]

#### **UPCOMING ISSUES**

#### November: Responding to Community Violence and Trauma January: Connecting Science, Policy, and Practice March: Prenatal Influences on Child Development

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