

Baylor
College of
Medicine



EXPANDING THE ROLE OF THE PEDIATRIC PRACTICE:

A Blueprint To Support Early Brain Development, Healthy
Children, Stable Families, And Thriving Communities

November 2019

LEAD AUTHORS

Nancy Correa, MPH

*Public Health Pediatrics
Texas Children's Hospital*

Valerie Longmire-Jefferis, JD, LLM

*Public Health Pediatrics
Texas Children's Hospital*

CONTRIBUTORS

Avni M. Bhalakia, MD

*Department of Pediatrics
Baylor College of Medicine and
Texas Children's Hospital*

Jean L. Raphael, MD, MPH

*Academic General Pediatrics
Baylor College of Medicine and
Texas Children's Hospital*

Cary Cain, PhD, MPH, RN

*Public Health Pediatrics
Baylor College of Medicine and
Texas Children's Hospital*

Ryan Ramphul

*Community Benefits
Texas Children's Hospital*

Angela Cummings, DrPH

*Public Health Pediatrics
Baylor College of Medicine and
Texas Children's Hospital*

Jennifer Reiss

*Public Health Pediatrics
Baylor College of Medicine*

Suratha Elango, MD, MSHP

*Department of Pediatrics
Baylor College of Medicine and
Texas Children's Hospital*

Frances Lee Revere, PhD, MS

*Fleming Center for Healthcare Management
University of Texas School of Public Health*

Christopher Greeley, MD, MS, FAAP

*Public Health Pediatrics
Baylor College of Medicine and
Texas Children's Hospital*

Lia C. Rodriguez, MD FAAP

Texas Children's Health Plan

Paige Killelea

*Department of Pediatrics
Baylor College of Medicine*

Kwabena Sarpong, MD, MPH

*Child Abuse Pediatrics
Baylor College of Medicine and
Texas Children's Hospital*

Margaret Lampe, LMSW

*Social Work
Texas Children's Hospital*

Heidi Schwarzwald, MD, MPH

*Department of Pediatrics
Baylor College of Medicine and
Texas Children's Hospital*

Kimberly Lopez, DrPH, MPH

*Public Health Pediatrics
Baylor College of Medicine and
Texas Children's Hospital*

Kay Tittle, MS, RN, FACHE

Texas Children's Pediatrics

Osama Mikhail, PhD

*Department of Management,
Policy and Community Health
University of Texas School of Public Health*

Matthew Usevitch

*Department of Pediatrics
Baylor College of Medicine*

ACKNOWLEDGEMENTS

We are grateful to the Episcopal Health Foundation, Katy Butterwick, and Jo Carcedo for their support of this project and dedication to bettering the health, well-being, and development of children and families in our community. We also offer heartfelt thanks to the 150+ parents, pediatricians, community partners, and subject matter experts for sharing their time, ideas, experiences, and expertise with us.

ABOUT TEXAS CHILDREN'S HOSPITAL

Texas Children's Hospital, a not-for-profit health care organization, is committed to creating a healthier future for children and women throughout the global community by leading in patient care, education, and research. Consistently ranked as the best children's hospital in Texas, and among the top in the nation, Texas Children's has garnered widespread recognition for its expertise and breakthroughs in pediatric and women's health. The hospital includes the Jan and Dan Duncan Neurological Research Institute; the Feigin Tower for pediatric research; Texas Children's Pavilion for Women, a comprehensive obstetrics/gynecology facility focusing on high-risk births; Texas Children's Hospital West Campus, a community hospital in suburban West Houston; and Texas Children's Hospital The Woodlands, the first hospital devoted to children's care for communities north of Houston. The organization also created Texas Children's Health Plan, the nation's first HMO for children; has the largest pediatric primary care network in the country, Texas Children's Pediatrics; Texas Children's Urgent Care clinics that specialize in after-hours care tailored specifically for children; and a global health program that's channeling care to children and women all over the world. Texas Children's Hospital is affiliated with Baylor College of Medicine. For more information, go to www.texaschildrens.org.



TABLE OF CONTENTS

Introduction.....	5
Methodology.....	7
Results.....	8
Community Engagement.....	10
Parenting and Child Development.....	13
Behavioral Health.....	16
Family Medical Care.....	17
Social Determinants of Health (SDH).....	19
Overall Changes to the Practice.....	22
Additional Components.....	23
Screening.....	25
Case Studies.....	27
Operationalizing the Model.....	28
Economic Analysis of the Model.....	33
Evaluation of the Model.....	34
Policy and Sustainability.....	35
Conclusion.....	37
References.....	38
Appendix A. Interviews.....	43
Appendix B. Early Brain Development Programs, Trainings, and Resources for Pediatric Practices.....	44
Appendix C. Integrated Behavioral Health Training Tools.....	47
Appendix D. Economic Analysis of the Core Components of the Expanded Model of Pediatric Care.....	48
Appendix E. Evaluation of the Model.....	67
Appendix F. Evaluation Measure Specification Template.....	74

INTRODUCTION

The first years of a child's life sets the foundation for lifelong learning, health and behavior.^{1,2} It is estimated that 80% of brain development occurs between ages 0 to 3, during which time the brain organizes pathways and sets trajectories for cognitive, mental, social-emotional, and physical health. Positive or negative experiences in early childhood impact these pathways and trajectories, and, therefore, the development of the brain. Promoting early brain development does not consist of a single strategy, but requires a broad approach including: nurturing and responsive caregivers; high quality learning environments; healthy physical and mental functioning of parents; adequate food and nutrients; early identification and intervention for medical issues and developmental delays; and preventing exposure to adverse childhood experiences, toxins, infections, and injuries.³



Pediatric practices are optimally positioned to promote early brain development, healthy children, stable families, and thriving communities. In the first 3 years of life, children have 12 well-child visits and pediatric practices are typically located in the communities and neighborhoods where families live, work, and play.⁴ Families also tend to respect, trust, and seek advice from pediatricians and their staff.⁴

The frequent early contact, trust, and respect that pediatric providers enjoy with young families create a unique opportunity and responsibility for pediatric practices to expand their role and partner with community organizations to more comprehensively address the developmental, social, and behavioral needs of children and families in their care. Furthermore, to have a transformative impact on children and families, pediatric practices will need to take a more holistic approach to health as it is estimated that healthcare accounts for only 20% of a person's health. Behaviors, physical environment, socioeconomic factors, and genetics account for the remaining 80%.⁵

The goal of this blueprint is to propose a practice model which builds upon the trusted relationship between pediatric practices and the children and families they care for that will help families build strong foundations for lifelong health and learning. This practice model does not ask the pediatrician solely to do more; rather it expands the scope of the practice as a whole from traditional medical care (immunizations, well-child checkups, minor illnesses) to encompass parenting and child development, behavioral health, select family medical care, social determinants of health (SDH), and community engagement in order to provide more comprehensive, impactful care.

With generous support from the Episcopal Health Foundation, this report provides a blueprint on how pediatric practices can serve as a community change agent to promote early brain development,

healthy children, stable families, and thriving communities. It details the crucial roles parenting and child development, behavioral health, select family medical care, SDH, and community engagement and partnerships play in this effort. Also included in this report are case studies of innovative pediatric practices from across the nation, suggestions for operationalizing and evaluating the efficacy of this model, screening recommendations, and an analysis of the economic benefits of investing in children and families through the pediatric practice.



STRATEGIES TO SUPPORT EARLY BRAIN DEVELOPMENT

Nurturing, responsive caregivers. Nurturing and responsive caregiver-child interactions during the first few years of life impact lifelong health, social-emotional capacities, and self-regulation. Consistently responding to infant needs and engaging children by talking, singing, reading, and playing with them provides the stimulating and secure environment found to be critical to healthy early brain development.⁶

High-quality learning environments. High-quality home and, if applicable, daycare or preschool environments with consistent serve-and-return interaction, stimulating toys and books, and age-appropriate enrichment opportunities are also critical to healthy early brain development.⁵ Serve and return is the back and forth interaction between a young child and caregiver.

Healthy, functional parents. Parents need to be physically and mentally healthy in order to provide the responsive, secure, stimulating environments their infants and young children need.⁷ If a parent has a chronic mental or physical health issue, they may be unable to adequately care for and engage with their child.⁶

Adequate nutrition. An infant must consume adequate nutrients to support healthy brain development. Infants and young children who do not receive adequate nutrition through breast milk or infant formula, fresh fruits and vegetables, healthy proteins and fats are more likely to sustain brain-growth impairments.⁸

Early identification and intervention for medical issues and developmental delays. Circuits in the brain are most flexible during the first 3 years of life. Identifying medical issues and developmental delays during this critical developmental period can improve long-term outcomes for children.^{9,10}

Preventing exposure to adverse experiences, toxins, infections, and injuries. The developing brain is particularly vulnerable to stressors¹¹ (like maltreatment or living in a chaotic home), toxins (like lead or tobacco exposure), infections (like meningitis or measles), and injuries (like those sustained from falls or physical abuse). These exposures can alter and disrupt key neural networks and functions.

METHODOLOGY

To develop and refine an expanded model of pediatric care, our core team of pediatricians, healthcare executives, social workers, medical students, public health professionals, health economists, researchers, and representatives from managed care organizations met monthly to discuss our work. Our methodology included the following components.

LITERATURE REVIEW: Our core team reviewed over 200 peer-reviewed articles, white papers, foundation reports, government reports, news articles, and program websites on innovative and effective approaches to pediatrics.

SWOT ANALYSIS: At the outset of our project, we conducted a SWOT analysis—of Strengths, Weaknesses, Opportunities, and Threats—to identify what about our current pediatric system is working well and opportunities for improvement.

INTERVIEWS: Our team interviewed more than 150 pediatricians, parents, health economists, subject matter experts, clinic managers, hospital administrators, behavioral health providers, social workers, and representatives from community service organizations, think tanks, federally qualified health centers, parenting programs, medical-legal partnerships, local government, and child care centers to best develop and refine our pediatric practice model. The interviews included 37 in-person interviews with parents to obtain feedback on what services they would want to be offered through a pediatric practice. We also interviewed innovative pediatric practices from across the country in order to learn how practices can best address SDH, child development, behavioral health, and community needs. For a list of organizations interviewed, see Appendix A.

SITE VISITS: We conducted site visits with hospitals, clinics, and community centers in Pittsburgh, Pennsylvania; Columbus, Ohio; and Cincinnati, Ohio to see modern, child-well-being-focused pediatric practices at work. We were able to see firsthand the programs in action as well as gain an understanding of the programs' successes and challenges. In addition, we hosted a site visit at Texas Children's Hospital with Paul Dworkin, MD, the Founding Director of the Help Me Grow National Center and Executive Vice President for Community Child Health at Connecticut Children's Medical Center.

TEXAS PRIMARY CARE CONSORTIUM: We presented a draft of our pediatric practices model at the Texas Primary Care Consortium meeting to elicit and incorporate feedback from 40 professionals from across the state.

ECONOMIC ANALYSIS: We performed an economic analysis of the core components of the model to understand the additional costs, expected outcomes, and associated cost savings. These cost savings include statewide healthcare, education, child welfare, and criminal justice savings.

RESULTS

Five overarching domains were identified for pediatric practices to integrate into their practices to support early brain development, healthy children, stable families, and thriving communities. The foundation of the model is high-quality medical care with additional domains that include 1) community engagement, 2) parenting and child development, 3) integrated behavioral health, 4) family care, and 5) social determinants of health.

FRAMEWORK: TARGETED UNIVERSALISM

Our model utilizes a targeted universalism framework in which universal strategies and targeted strategies work in tandem to achieve universal goals of early brain development, healthy children, stable families, and thriving communities.¹² *Universal strategies* serve everyone regardless of income, vulnerability, or need, and provide broad support to all families. *Targeted strategies* provide additional, tailored support to specific populations with particular needs identified through formal screenings and/or informal conversations with pediatric professionals. Combining these two strategies enables pediatric practices to optimize resources for the health, well-being, and development of all children and families.

THE MODEL

Our model aims to serve as a blueprint for pediatric practices. The model includes “core components” that we recommend practices adopt from each of the five domains: 1) community engagement, 2) parenting and child development, 3) integrated behavioral health, 4) family medical care, and 5) SDH. These core components combine well-studied practices and programs that have yielded high returns on investment with new and innovative approaches. The model also includes “additional components” that practices may consider adopting depending on the needs and resources of the populations they serve. This approach gives practices the flexibility to prioritize and adopt the programs and services that will support their particular patients and families. An overview of the model is shown in Table 1.

In this section of our report, we lay out the evidence supporting the five domains and describe in detail the core components of each domain. We next describe the “additional components” that practices may consider adopting depending on their families’ particular needs, and discuss the changes necessary to implement the core and additional components.

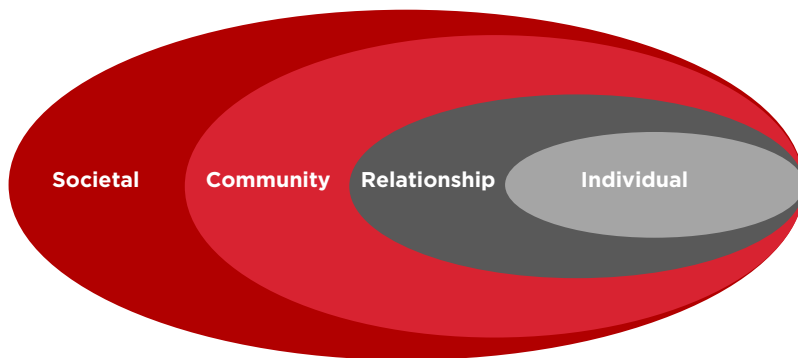
TABLE 1. THE EXPANDED MODEL OF PEDIATRIC CARE

	Core Components	Additional Components <i>Based on community and clinic assets and needs</i>
Community Engagement	<ul style="list-style-type: none"> Community assessment and understanding community needs and assets Establish and strengthen partnerships and communication with community organizations 	<ul style="list-style-type: none"> Establish community advisory board Community health education and partnerships (i.e., health fairs, adopt-a-school, school health advisory councils, etc.) Data sharing between pediatric practices with schools, child care, and/or community organizations Shared use of space and joint programming at the pediatric practice and in the community State and local level advocacy to support child and family health
Parenting and Child Development	<ul style="list-style-type: none"> Home visitation for parents of newborns (i.e., Family Connects) Extended well-child checks at key developmental stages Parenting helpline Parenting consultations Early brain development programs 	<ul style="list-style-type: none"> Parenting peer support groups Parenting seminars and classes Take-home activities to support parenting and child development Re-design of waiting rooms and patients rooms to support learning Parenting support for fathers and other caregivers
Behavioral Health	<ul style="list-style-type: none"> Integrated behavioral health with a licensed behavioral health provider Referral network and coordination with services 	<ul style="list-style-type: none"> Provider consultations with psychiatrists and psychologists Behavioral health services at schools and/or other community locations Telepsychiatry
Family Medical Care	<ul style="list-style-type: none"> Identification, brief counseling, and referrals for specific parental health needs that impact child health <ul style="list-style-type: none"> » Family planning and lactation support » Parent immunizations » Smoking cessation » Parental depression On-site immunizations for parents 	<ul style="list-style-type: none"> Expanded counseling and education (i.e., lactation consultant, family planning, smoking cessation) Expanded on-site immunizations for parents Co-located adult medical services Nicotine replacement therapy Hiring a family nurse practitioner to address family medical care needs Telehealth to address adult health needs Identification, brief counseling, and referrals to treatment for parental substance abuse
Social Determinants of Health (SDH)	<ul style="list-style-type: none"> Social needs identification and resource sheet for all families Community health coordinator to seamlessly connect families with services Embedded community organizations that address patient and family needs within pediatric practices (i.e., medical-legal partnership) 	<ul style="list-style-type: none"> Self-service referrals, interactive information kiosks, and/or phone applications to access resources Incorporation of SDH resources in waiting room and patient rooms On-site food, clothes, diaper pantries On-site health coverage and social services enrollment assistance (i.e., Medicaid, SNAP, WIC, etc.) Partner with community organizations to address SDH including medical-legal partnership, financial counseling, job training, literacy, and child care Provide funding for community partners to address patient SDH Provide funding to address immediate social needs linked to child health
Overall Changes to Practice	<ul style="list-style-type: none"> Recruit additional staff to support new components Train staff on new model and core competencies (i.e., early brain science, cultural sensitivity, motivational interviewing, new workflow) Clinical assessment Enhanced coordination of specialty medical services 	<ul style="list-style-type: none"> Extended hours including early morning, evening, and weekends Telehealth Co-location of oral health, eye care, pharmacy, dietitians Mobile clinics Payment model reform (tailored payment contract model based on community needs) Transportation to and from appointments Pharmacy delivery service Hire staff from the community that reflect the patient population

COMMUNITY ENGAGEMENT

Community engagement is the process of working collaboratively with partners to address issues affecting community well-being.¹³ Community engagement will be critical to the success of the expanded pediatric practice because the determinants of health and well-being are rooted in larger community and societal conditions.¹⁴ As the socio-ecological model illustrates in Figure 1, a clinic focused only on individual patients will be limited in its ability to effectively address the complex health issues facing vulnerable populations.¹⁵ Maintaining close personal patient relationships not only establishes trust but connects and engages pediatric practices with the interpersonal, community, and societal influences affecting patients and families.

Figure 1. Socio-ecological Model



Adopted from the Centers for Disease Control and Prevention

Pediatric practices must build relationships with community partners in order to understand the unique needs and assets of the communities they serve. Understanding their communities allows pediatric practices to prioritize efforts, use existing resources to meet pressing community needs, and identify the cultural influences that affect patient and family health behaviors. For pediatric practices to effectively promote patient health, they must understand the cultural influences upon it.¹³

Each community partner has a unique vantage point; when combined, these perspectives can help clinics understand the “patient experience” as a whole. Vulnerable populations tend to interact with multiple safety-net services and agencies to address their needs. These safety-net services and agencies are often disconnected from one another, making clients vulnerable to getting lost in the system or having certain critical needs overlooked. Collaboration and follow-up with community agencies that fulfill these needs can help pediatric practices address the root causes of challenges to their patients’ health and well-being.

Community engagement and partnerships also enable the pediatric practice to reach children and families not currently engaged in pediatric care. About 10% of children have not received a well-child visit in the past year; these children are less likely to have health insurance and their parents



less likely to have high school degrees.¹⁶ Through community engagement and trusted community partners, pediatric practices can help reach families that are not receiving preventative care and provide education on available pediatric services and the importance of pediatric care.

To embed community engagement into the pediatric practice, our model includes conducting a needs assessment to understand community needs and assets, and establish and strengthen partnerships and linkages with community organizations.

COMMUNITY ASSESSMENT AND UNDERSTANDING COMMUNITY NEEDS AND ASSETS

To best serve patients and the surrounding community, a pediatric practice needs to engage with and understand the needs and resources in the community. This will allow the pediatric practice to meet community needs, leverage the practice's and community's assets, and utilize available community resources.

To understand the community needs, a needs assessment should be conducted. [The Association for Community Health Improvement](#) and the [Centers for Disease Control and Prevention](#) have excellent guides that can be used as a reference. Steps include:

- Reflect: Reflect on previous assessments and establish an assessment team.
- Identify and engage stakeholders: Identify individuals and organizations who are representative of the community to participate in the assessment.
- Define the community: Identify the community of interest, which may be geographical or a specific population.
- Collect and analyze data: Collect data from both the clinic and the community. Practices can use existing resources like the [Health of Houston Survey](#), the [Episcopal Health Foundation County Health Data Snapshots](#), and nonprofit hospitals' community health needs assessments. Practices can also interview patients and community members, and pull aggregate data from the pediatric practice's electronic medical record.
- Prioritize community health issues: Identify and prioritize community health needs that the clinic and community partners are most interested in addressing.
- Document and communicate findings: Share assessment findings with the community and community partners.
- Plan implementation strategies: Develop a plan to address the prioritized community health needs.
- Implement strategies: Implement the plan to address the community health needs.
- Evaluate progress: Measure and evaluate how effectively these interventions address the community health needs identified.

ESTABLISH AND STRENGTHEN PARTNERSHIPS AND LINKAGES WITH COMMUNITY ORGANIZATIONS

Pediatric practices should establish and strengthen partnerships with community organizations such as daycares, preschools, schools, libraries, community centers, YMCAs, faith-based centers, law enforcement, fire department/emergency medical services, and food pantries. Working with community partners allows pediatric practices to best identify areas of overlapping interests, relevant existing programming, and opportunities for collaboration. For example, a pediatric practice may refer patients to a local community center to



participate in that center's programs while the community center may refer clients to the pediatric practice or invite professionals from the pediatric practice to engage with their clients. Similarly, a pediatrician from the practice may participate on a school's health advisory council and provide the school with timely and accurate recommendations to address school health needs. Practices should meet with community partners regularly, either collectively or individually, and explore opportunities to share data and information as well as offer joint programming. Pediatric practices have a unique insight and understanding of the health needs of families in a community, and through effective community partnerships, there may be increased opportunities to prioritize and address community health needs.



Coordinated approaches with community partners can promote optimal brain development. Pediatric providers and staff can:

- Lead and/or participate in community coalitions and initiatives that support early learning, healthy child development, and school readiness.
- Offer supportive services in safe, convenient places—like libraries, laundromats, playgrounds, and community centers—that families regularly visit.
- Reduce social isolation of parents of young children by connecting them with community programs at libraries, toddler gyms, faith-based organizations, children's museums, or YMCAs.
- Provide families warm handoff referrals to connected community partners so that families are more likely to take advantage of resources that support optimal brain development, such as healthy, fresh food, safe and stable housing, and educational opportunities.
- Connect families to high-quality childcare and schools (if these do not exist, the pediatric practice can advocate for their establishment in the community).
- Team with community partners to provide consistent messages for families about how to support their children's healthy development.

PARENTING AND CHILD DEVELOPMENT

Parents are commonly the greatest influence in a child's life so sensitive and responsive parenting is fundamental to children's brain development and to their physical, emotional, social, behavioral, and intellectual capabilities. Research has shown that disparities in parenting knowledge, resources, and support impact the home environments in which children are raised.¹⁷ Children raised in socioeconomically disadvantaged households may experience less cognitive stimulation and parent responsivity; harsh or permissive parenting, both of which are associated with child behavioral problems; diminished readiness to learn; and increased parenting stress.^{17,18} Parenting education interventions have been shown to enhance children's social-emotional development, decrease rates of childhood behavioral disorders, reduce parental stress and anxiety, and lower the risk of child maltreatment.¹⁹⁻²¹ Parenting education is designed to improve parenting skills and family communication, prevent child and family problems, and educate parents on child development and positive parenting practices.²¹

The pediatric practice is an ideal venue to connect parents with child development and parenting education and support due to access, frequency, and familiarity.²² There are 12 recommended well-child visits in the first 3 years of life and annual well-child visits throughout adolescence. Given the frequency of these visits, it is unsurprising that many parents perceive their pediatricians as trusted sources of information and seek their advice on medical and nonmedical child development and parenting concerns.⁴ Traditional group-based parenting classes have proven effective, but participant retention presents a substantial challenge to these programs.²³ Integrating individual universal parenting education into the pediatric practice may be a more effective method of reaching families.

To integrate parenting and child development education into the pediatric practice, our model includes universal home visits for parents of newborns; extended well-child visits at seven key developmental stages; early brain development programs; consultations with parenting specialists to address common parenting challenges; and a parenting help line.

Pediatric practices see fewer “traditional” families than ever before, and practices must be equipped to support different family structures. Throughout this report, the terms “parents” and “parenting” should be interpreted broadly to include any primary caregiver, including grandparents, step-parents, aunts, uncles, and others.



UNIVERSAL HOME VISITATION FOR PARENTS OF NEWBORNS

All families with newborns will be offered a home visitation program, such as Family Connects. Family Connects is a universally offered, evidence-based nurse home-visiting program for parents of newborns that is intended to be delivered when the baby is approximately 3 weeks of age. A trained registered nurse first visits the home and can assist with maternal and infant health concerns, home safety, breastfeeding, postpartum depression, substance use, domestic violence, child-care access, parenting education, family planning, financial concerns, and social support, depending on each family's needs. Family Connect nurses visit most families between one to three times. Universal home-visitation programs can connect families with services early on and may help re-frame the role of pediatric practice for families at the earliest stages of development. A discussion of the Family Connects program can be found in Appendix B.

EXTENDED WELL-CHILD VISITS

A key component of a well-child visit is anticipatory guidance in which a health care provider offers information to families on the expected growth and development of their child. Currently, however, many pediatricians lack the time to comprehensively address child development during the well-child visit.

Our model proposes that all families receive extended well-child visits during key developmental phases at the 2-month, 6-month, 18-month, 30-month, 5-year, 11-year, and 15-year well-child visits. Parents will spend an extra 15 minutes discussing child development and corresponding parenting topics with a parenting specialist. Potential topics for discussion include:

- 2 months: bonding, responsive parent-child interactions, and shared book reading
- 6 months: transition to crawling and walking, safety and monitoring, and preparing for positive discipline
- 18 months: tantrums, positive discipline, and scaffolding language
- 30 months: toilet training, preschool readiness, and language acquisition
- 5 years: adjustment to structured school, pro-social child behavior, perspective taking skills, and importance of regularly reading
- 11 years: monitoring mood and changes associated with puberty, building independence and appropriate limit setting, positive relationships and friendships, online behavior, and bullying
- 15 years: emotional processing and development, risk-taking behavior, and helping parents stay connected to their children while allowing them to become more independent

These extended well-child visits will allow the pediatric practice to spend more time discussing child development and parenting strategies, observing parent-child behavior, and modelling behaviors.



EARLY BRAIN DEVELOPMENT PROGRAMS, TRAINING, AND RESOURCES

The pediatric primary care practice can use several methods to support optimal early brain development. It is critical that pediatric providers and clinic staff receive training on the science of early brain development and best practices to promote it. Pediatric practices can also refer families to a variety of community early brain development programs or integrate the content of such programs into their own interactions with families. Specific early brain development programs, training, and resources can be found in Appendix B.

PARENTING CONSULTATIONS

Parents who need support in handling common parenting challenges (i.e., toilet training, tantrums, whining, bullying) will be referred to the parenting specialist for parenting consultations. Parents will be identified through a screening process as well as a provider referral. The parents will spend 15 – 30 minutes with the parenting specialist for 1 to 3 visits to address the parenting challenge. Parenting consultations can be completed in person or over the phone. The parenting specialists will have specialized training to support families to address common parenting challenges such as Triple P Level 3 Primary Care and early brain development training programs. Triple P Level 3 Primary Care is an evidence-based parenting program that helps parents address specific problem behaviors or issues. There are several early brain development training programs of varying length and intensity for providers.²⁰ Options include Promoting First Relationships in Primary Care; Early Childhood Health Optimization Training for Pediatricians, Ob/Gyns, Therapists, Care Coordinators, Behavioral Health, Home Visitors, and Practitioners; Early Brain and Child Development Education and Training Modules; Brain Story Certification; and The Growing Brain: From Birth to 5 years Old, A Training Curriculum for Early Childhood Professionals. See Appendix B for detailed information on the training programs.



Some families may need more support than the parenting specialist can provide. These families will be referred to the integrated licensed behavioral health provider (LBHP) for more in-depth counseling and support. These behavioral health providers will be trained in behavioral interventions including the Research Units in Behavioral Intervention (RUBI) protocol, Defiant Children, Defiant Teens, and Parent Management Training. The LBHP will offer family and/or individual child or parent sessions, and the LBHP will use their clinical judgment on the best approach for individual families.

PARENTING HELPLINE

Parenting questions often arise in between scheduled appointments with the pediatric practice. In our model, we will offer families an avenue to receive accurate and timely parenting advice to address their concerns. Parents will be encouraged to call, email, or text the pediatric practice to communicate with a parenting specialist to discuss concerns related to parenting, child development, and managing the child's behavior in a similar manner as questions on a child's health.



Stimulation, responsive parent-child interactions, child-directed enrichment, early learning, and positive parenting are critical for optimal child development. The parenting and child development components in our model promote early brain development by supporting parents, addressing parental stress and concerns, educating parents about childhood developmental milestones, and fostering secure attachment and nurturing parenting practices.

BEHAVIORAL HEALTH

Traditionally, behavioral health and physical health have been treated separately, and pediatric practices have focused on physical health. In recent years, there has been more attention and evidence in supporting the integration of behavioral health into pediatric and primary care practices. Behavioral health care encompasses services for anxiety, attention-deficit disorder (ADD), attention-deficit/hyperactivity disorder (ADHD), conduct disorder, depression, post-traumatic stress disorder, specific phobias, and substance use disorders (SUDs).²⁴ Behavioral health services are essential to supporting overall health because 51.3% of Americans will receive a mental health diagnosis in their lifetimes, and most mental illnesses originate in childhood.²⁵ Behavioral health conditions adversely impact childhood education and often persist into adulthood, impacting employment.²⁶⁻²⁹

Children often see their pediatrician for both physical and behavioral health concerns, but because relatively few pediatricians feel comfortable managing behavioral health conditions alone, they tend to refer patients with these concerns to outside behavioral health providers.^{30,31,32} Unfortunately, several barriers exist to receiving care from independent behavioral health providers, including the stigma around mental illness, lack of trained providers, long wait times, insufficient payments for providers, and the dearth of pediatric behavioral health providers who accept insurance.^{33,34} As a result, it is estimated that only 20-25% of children with mental health diagnoses receive treatment.³⁵

Despite these challenges, research suggests that 70% of pediatric behavioral health issues can be co-managed by a pediatrician and mid-level behavioral health provider such as a Licensed Clinical Social Worker or a Licensed Professional Counselor.

Our model integrates a LBHP into a pediatric practice and establishes a referral network with coordination of follow-up services to better support the whole child, and the whole family.

INTEGRATED BEHAVIORAL HEALTH WITH A LICENSED BEHAVIORAL HEALTH PROVIDER

To meet the behavioral health needs of children, pediatric practices will offer integrated behavioral health by adding a mid-level LBHP to the pediatric practice. Children and caregivers are screened for behavioral health issues at well-child visits, and providers identify families that would benefit from support from a behavioral health provider. Mid-level behavioral health providers are able to bill for their services using traditional psychotherapy codes as well as health behavior assessment and intervention (HBAI) codes to offset the expense of employing a behavioral health provider. Extensive training modules and templates on how to integrate behavioral health into pediatric practices and how to bill for these services are available on the Texas Children's Health Plan provider portal or by request. See Appendix C for available trainings, templates, and modules.

REFERRAL NETWORK AND COORDINATION OF FOLLOW-UP SERVICES

Patients with more complex behavioral health issues that cannot be addressed by a mid-level behavioral health provider and a pediatrician will be referred to a psychologist and/or psychiatrist as needed. Scheduling appointments with psychologists and psychiatrists can be challenging, and the practice can help families secure appointments with a behavioral health specialist to help meet the children's behavioral health needs.

Early identification of behavioral issues and developmental delays (i.e. autism, speech or hearing delays) plus timely intervention can improve outcomes for children. It is not enough to detect concerns early. The child's developing brain is most malleable during the first few years of life and early intervention can enhance the development of the child and prevent or alleviate future negative outcomes.³⁶



FAMILY MEDICAL CARE

No one plays a more important role in determining a child's health than the family. Not only do families share physical environments, but families' social interactions also affect the health of the child.³⁷ Additionally, common SDH that affect the whole family can affect child health, such as poverty, education, and housing. Ultimately, addressing the health of the whole family will improve the child's health and population health.

It is also important to note that many adults do not routinely seek preventive medical care when they are healthy, due to a lack of time, lack of insurance coverage, and an unawareness of recommended routine preventive care.³⁸ The pediatric practice therefore presents an opportunity to address the family health needs that most impact their children's well-being including mental health (specifically depression), tobacco use, immunizations, family planning, and lactation services.

DEPRESSION

Depression is a common medical illness that often goes untreated. Approximately 20% of mothers experience postpartum depression while 25% of the population suffers from a mental health problem at some point in life.^{30,39} When left untreated, depression can impair both physical health and relationships.⁴⁰ Perinatal depression, which includes postpartum depression, can negatively impact mother-infant bonding, interactions, and attachment.³⁰ Parental depression can lead to hostile, negative, and disengaged parenting, as well as poorer physical health and well-being in their children. By screening parents for depression in the pediatric practice, providers can alert parents that they have screened positive for depression, normalize depression as a common and treatable illness, and refer them to appropriate resources.



Our model pediatric practice will screen mothers with infants for postpartum depression at the 2-week, 2-month, 4-month, 6-month, and 9-month well-child visits using the Edinburgh Postnatal Depression Scale (EPDS). Annual caregiver depression screening will begin at the 1-year well-child visit. Parents who screen positive will be counseled that they had a positive screen and referred to services.

Untreated maternal depression is associated with cognitive and language delays in children.^{41,42} This may be due to the lack of stimulation and reciprocal interaction between the parent and the young child, which is critical for optimal brain development. By connecting mothers with depressive symptoms to treatment and services, the pediatric provider is supporting the healthy development of the child.



TOBACCO CESSATION

Decades of research has shown that exposure to second-hand tobacco smoke puts children at risk for sudden infant death syndrome (SIDS), middle ear disease, asthma, and pneumonia.⁴³ There is no safe level of tobacco smoke exposure, and embryos, fetuses, infants, and young children are particularly vulnerable to harm from tobacco smoke.⁴³⁻⁴⁵ Approximately 50% of smokers are interested in quitting, and although quitting smoking is difficult and successful cessation rates are low, effective tobacco cessation programs do exist to help parents quit.⁴⁶ Parents who quit smoking improve not only their own health but also their children's health.

To reduce second-hand smoke exposure, pediatric practice staff will ask caregivers during well-child visits whether their children spend time with smokers. The practice can then offer appropriate resources and follow-up as needed.

Exposure to nicotine during critical pre- and post-natal periods of brain development is associated with increased incidence of auditory and cognitive deficits, attention deficit hyperactivity disorder (ADHD), and poor impulse control. Offering tobacco cessation program information to caregivers supports healthy environments in which young brains can best grow.⁴⁷



IMMUNIZATIONS

Our model also aims to prevent infectious diseases by administering vaccines to caretakers. “Cocooning” is a strategy that immunizes household contacts in order to protect young and vulnerable children from preventable exposure to infectious diseases. Cocooning is specifically used for infants younger than 2 months of age who are too young to receive vaccines, and therefore at higher risk of morbidity and mortality from pertussis infection. More than half of infant pertussis infections are transmitted by close contacts like parents, grandparents, and siblings.⁴⁸ Nearly all infant fatalities from pertussis occur in children younger than 3 months.⁴⁹ Pregnant women currently receive the Tdap (tetanus, diphtheria, and pertussis) vaccine between 29-36 weeks of gestation also in order to provide passive immunity to their infants.⁴⁹



Children younger than 5 years, and especially younger than 2, are at high risk of morbidity and mortality from influenza.⁵⁰ Cocooning may also help prevent influenza infection-associated complications in infants younger than 6 months old, who are too young to receive the influenza vaccine. Other children with chronic diseases like asthma, cerebral palsy, and sickle cell anemia are also at higher risk of complications from influenza infections.

Our goal is to reduce the risk of both pertussis and influenza exposure by offering the vaccines to parents and family members in the pediatric practice. This will protect not only those who receive the vaccine but their children as well. By providing vaccines in the pediatric setting, it would also be convenient to parents who make multiple trips to the pediatric office.³⁸ Multiple research studies suggest that parents are willing to be vaccinated in order to protect their young children.³⁸

The pediatric practice will offer Tdap and influenza vaccines to parents and caregivers. The Tdap vaccine will be available to unvaccinated parents and caregivers of infants at the 2-week, 2-month, 4-month, and 6-month well-child visit. Pregnant mothers should have been vaccinated while pregnant, but these well-child visits give them a second chance while also reaching fathers, grandparents, and other caregivers. Parents and caregivers of children 0 - 1 year of age and parents and caregivers of children with complex medical needs will be offered the influenza vaccine during flu season.

FAMILY PLANNING AND LACTATION CONSULTATIONS

Our model also envisions addressing family-planning needs for all female caretakers within the pediatric practice. Nearly half of the pregnancies in the United States are unplanned.⁵¹ Unintended live births have

higher rates of maternal and infant health problems, interfere with maternal education, and can cause emotional and financial strain.⁵¹ In one survey, 82% of mothers who brought their children ages 0 to 3 to a pediatric practice said they needed contraceptive services.⁵² Of those, 75% reported using contraception, but only 33% used highly effective long-acting reversible contraception, such as intrauterine devices.⁵²

Pediatricians are uniquely positioned to ask and counsel female caretakers about family planning. Addressing this need could reduce unintended pregnancies, which would benefit women, mothers and their children, and society at large.

To promote healthy maternal and infant outcomes by increasing birth spacing and reducing unwanted pregnancies, the pediatric practice will screen mothers for family planning needs. For example, the “One Key Question” initiative suggests that screening for family planning needs should begin with the question, “Would you like to become pregnant in the next year?”⁵³ After asking this question, the pediatric practice can provide brief counseling and a referral to meet the mother’s family-planning needs.

Lactation support for all new mothers during their first few visits to the pediatric practice will also bolster maternal and infant outcomes. Breastfeeding has several proven benefits for babies and mothers who are able and want to breastfeed. For the mother, breastfeeding may decrease postpartum bleeding and decrease the risk of breast and ovarian cancers. For the baby, breastfeeding protects against diseases through passive immunity and lowers rates of respiratory tract infections, ear infections, gastrointestinal illnesses, and SIDS.⁵⁴

For mothers with infants, providing lactation consult services at the pediatric practice can help with the initiation and maintenance of breastfeeding, while also being convenient for the mothers who are already present at the appointment for their child. Staff at the pediatric practice will be trained in lactation consultation in order to best serve breastfeeding moms.

Family planning interventions increase the use of contraceptives and reduce unintended and high-risk pregnancies, including rapid repeat pregnancies, which can increase children’s risk of developmental delays and disability.⁵⁵ Nutrition is important to the newborn infant brain, so interventions promoting the initiation and maintenance of exclusive breastfeeding for the first 6 months of life can have long-term neurodevelopmental benefits.⁵⁶



SOCIAL DETERMINANTS OF HEALTH

While initiatives to improve health in the U.S. have historically focused on the health care system, there is increased recognition that other external factors play a major role in determining outcomes. SDH are defined by the World Health Organization as the “conditions in which people are born, grow, work, live, and age, and the wide set of forces and systems shaping the conditions of daily life.”⁵⁷ These factors include socioeconomic status, education, neighborhood and physical environment, transportation, food insecurity, child care availability, social support networks, and access to health care. While there is no evidence-based consensus on the magnitude of the relative contributions of each of these factors, numerous studies suggest that these factors are the primary drivers of health outcomes.⁵⁸ Throughout this report we refer to the widely used term, *social determinants of health*. However, it should be noted that we perceive these forces as *social drivers of health*. These factors have strong associations with health, but they do not solely *determine* health, which is a confluence of many complex individual, family, and community factors. For example, poverty is negatively associated with birth weight, language development, and nutrition.⁵⁹ Children born to poorly educated parents are also more likely to live in environments with substandard housing that lack in safety.⁶⁰

In health care, clinical providers are increasingly taking a leadership role in screening for and addressing SDH. Given their personal interactions with children and families, health care providers are uniquely positioned to identify social risk factors. Effective screening in the pediatric setting has increased the detection of unmet needs, quantity of referrals to community resources, and likelihood that families will utilize community resources.⁶¹ When screening for and addressing SDH, the health care system must take a number of factors into account. These include clinical staff training, screening frequency, determining who should screen and who should address screening results, screening impact on clinic flow, integration into electronic medical records, resource availability, community-partner feedback, and families' willingness to be screened.

To address SDH in the pediatric practice, our model incorporates identification of social needs, referring and connecting families with services, and embedding community partners into the pediatric practice.



IDENTIFICATION OF SOCIAL NEEDS

Families will be screened for social needs annually at the pediatric practice. As discussed in more detail in the screening section of this report, practices should only screen for social needs that they or vested community partners can address. When possible, the practice should use validated screening tools. To reduce stigma, the practice should also offer all families a list of local resources that address social needs, regardless of their screening results.

REFERRING AND CONNECTING FAMILIES WITH SERVICES

Many families do not follow through on referrals to address social needs. This is why our model includes a community health coordinator who can help families access resources to address their social needs. Prior to referring patients to community resources, the pediatric practice should meet with the community organizations to fully understand what services are available, eligibility requirements, and their capacity for additional clients.

EMBEDDING COMMUNITY PARTNERS INTO PEDIATRIC PRACTICE

In addition to identifying social needs and helping families connect with resources, one or two community organizations should be embedded in the pediatric practice to address common social needs of the patients and their families. Community needs, resources, and interests should determine which organizations to embed in the practice. Examples include medical-legal partnership, which makes an attorney available at the practice to provide legal assistance with common legal issues such as housing, special education services, and family violence situations; enrollment specialists to help families register for federal programs like SNAP and WIC; tax specialists to help families complete and file their tax returns; and specialists to help families enroll in high-quality early education programs like early Head Start and pre-K.



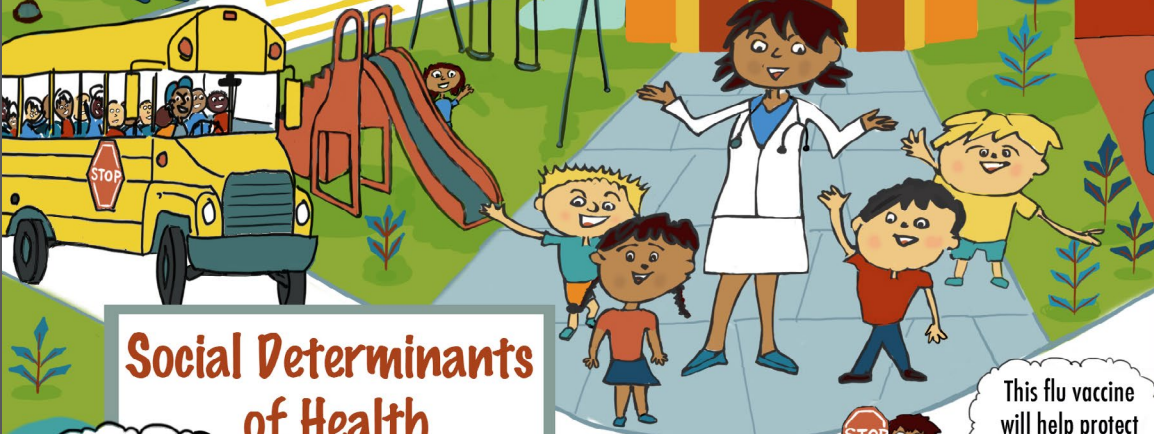
SDH play a crucial role in children's healthy development. Environmental influences like poverty directly affect early brain development.⁶² Addressing social needs can reduce stressors, which buffers harmful effects and promotes healthy brain development.

EXPANDING THE ROLE OF PEDIATRIC PRACTICES

Community Engagement



Parenting & Child Development



Family Medical Care



Social Determinants of Health



Integrated Behavioral Health



SUPPORTING EARLY BRAIN DEVELOPMENT, HEALTHY CHILDREN, STABLE FAMILIES, AND THRIVING COMMUNITIES

OVERALL CHANGES TO THE PRACTICE

In order to implement an expanded model of care, pediatric practices will need to make changes to the practice such as hiring additional staff, training staff, conducting clinical assessments, and enhancing care coordination.

ADDITIONAL STAFF

To implement this model, the pediatric practice will need additional staff such as nurse home-visitors, behavioral health providers, community health coordinators, community liaisons, social workers, and child-development and parenting specialists.

STAFF TRAINING

Pediatric practices will have to train their staff on the new model. Some staff will need specialized training on specific programs like Family Connects, Triple P, and the One Key Question, while the entire staff would likely benefit from training in early brain science, cultural sensitivity, motivational interviewing, and team-based care. See Appendix B for training options in early brain science and best practices in promoting optimal brain development.

CLINICAL ASSESSMENT

Most pediatric practices have limited space, time, and capacity. Similar to the community assessment, a clinical assessment will help practices understand what resources are currently available and what additional resources are needed to incorporate additional components, programs, and services into the practice.

MEDICAL CARE COORDINATION

While some pediatric practices and payors currently provide care coordination for medical needs, the parents we interviewed for this report identified better care coordination and assistance navigating the healthcare system as priorities. Care coordination becomes especially important for children with complex medical and developmental needs. Studies have shown that parents with low health literacy commonly report difficulty completing early intervention referrals.⁶³ Enhanced care coordination can therefore meet identified parent needs, better support children with complex medical and developmental needs, and improve the referral and evaluation process.



ADDITIONAL COMPONENTS

In addition to the core components described above, pediatric practices may want to consider these additional components. These components should be selected based on the resources available to the clinics and the needs of families and the community.

COMMUNITY ENGAGEMENT

- Establish a community advisory board to seek input from the community to identify and prioritize initiatives.
- Provide expert pediatric health advice to the community by participating in events like health fairs and partnering with organizations like schools, daycares, and after-school programs.
- Explore opportunities to share data with local child-serving agencies such as schools, child care agencies, and community organizations. Parental consent and a legal review will be necessary, but data sharing and open communication channels between schools and pediatric practices may lead to better care for children. For example, a school could directly refer students to the pediatric practice or access a child's vaccination record.
- Sharing space and joint programming—like offering behavioral health or sports physicals at schools, or allowing community partners to use the clinic space after hours or on weekends for parenting classes and civic club meetings—may increase convenience and reduce barriers to care for working families and families with limited transportation.



PARENTING AND CHILD DEVELOPMENT

- Offer parenting peer support groups such as groups for new parents or moms with postpartum depression.
- Offer group parenting classes for common parenting challenges such as surviving the “terrible twos” or preparing for kindergarten.
- Provide families with take-home activities to promote parent-child engagement and child development.
- Re-design waiting and patient rooms to support parent-child interaction and learning.



BEHAVIORAL HEALTH

- Participate in provider consultation networks, which allows providers at the pediatric practice to consult with psychologists and psychiatrists on managing behavioral health. This will help the pediatric practice manage more behavioral health concerns at the practice and decrease the number of patients referred to off-site psychologists and psychiatrists, which are often expensive and can have long wait times.
- Offer behavioral health services at schools and other convenient community locations to reduce barriers to care.
- Offer telepsychiatry for patients who need more intensive services than the mid-level integrated behavioral health provider can provide. Telepsychiatry is especially useful for pediatric practices located in communities that lack adequate access to mental health services.

FAMILY MEDICAL CARE

- In addition to identifying and referring parents with particular medical needs to the appropriate specialists, offer co-located adult medical services at the pediatric practice. This could be accomplished through adding a family nurse practitioner to the practice who is able to provide care to both adults and children.
- Offer telehealth to address a limited scope of adult healthcare needs.
- Expand the availability of influenza and Tdap immunizations to more family members.
- Offer nicotine replacement therapy to patients' adult family members.
- Provide more in-depth lactation, family-planning, and smoking cessation counseling and education.

SOCIAL DETERMINANTS OF HEALTH

- Promote community resources in the waiting room and patient rooms. Add an information kiosk to help families look up available resources.
- Integrate a social resource platform into the electronic health record to facilitate referrals and communication between the pediatric practice and community partners.
- Assist families with enrolling in programs like Medicaid, SNAP, and WIC.
- Have an on-site pantry for food, clothes, diapers, and other necessities.
- In collaboration with community partners, offer financial counseling, job training, and/or literacy courses.
- Establish a fund to help vulnerable families fill immediate and urgent social needs linked to their children's health.
- Fund community partners who address family social needs. Such funding could help community partners build capacity or incentivize them to complete referrals and communicate their outcomes to the pediatric practice. The pediatric practice should make sure that potential community partners have the capacity to provide additional referrals without negatively impacting their current clients.

OVERALL CHANGES TO PRACTICE

- Clinics could make accessing services more convenient for working families by:
 - » Extending office hours to include early mornings, evenings, and weekends.
 - » Co-locating with dietitians and dental care, eye care, and pharmacy providers.
 - » Using mobile clinics to reach families without access to transportation.
 - » Partnering with a pharmacy delivery service to bring medications to patients' homes.
- Explore opportunities for payment-model reform and a payment contract that is aligned with the expected outcomes and metrics of this model.
- Offer transportation to and from medical appointments.
- Hire staff from the community that reflect the patient population when possible.

SCREENING

Most of our model's domains require some form of screening. Screening enables practices to identify their patients' and families' medical, developmental, and social needs and can be completed on paper, electronic tablets, or in person. Best practices for screening that were identified from the literature and our interviews include:⁶⁴

- Universally screen patients and families to avoid stigmatization and false assumptions about which families may benefit from additional services.
- Prior to screening, provide an introduction or explanation of the purpose of the screening and an opportunity to opt-out.
- Provide resource sheets to all families whether they screen positive or negative.
- Use screening tools that are validated, in the preferred language of the family, and at an appropriate literacy level.
- Only screen for items that the pediatric practice is able to respond to with either counseling or a referral. An exception to this best practice is if the pediatric practice is gathering data on the needs of patients as part of the needs assessment, in which case the purpose of the data collection should be disclosed to families.
- Be sensitive to how often families are screened and the length of screeners. Remove unnecessary questions to avoid screening fatigue.
- Couple screening with observations and discussions with the patient and family during the appointment.
- Document screening results in patient charts.
- Communicate the screening results to families.
- Be sensitive to who is in the room during the screening and communication of the screening results. For example, a provider should not discuss a positive maternal intimate partner violence screen in front of a verbal child or screen adolescents for tobacco and drug use in front of their parents.
- Make appropriate referrals and, when possible, help families see them through.
- Seek feedback once a referral is made to determine if the family's needs were met or if the family requires additional assistance.

Table 2 highlights the screening instruments and protocols our pediatric care model recommends. [The American Academy of Pediatrics' Screening Tool Finder](#) allows providers to search for screening tools regarding development, autism, social-emotional development, maternal depression, and SDH. For each screening instrument, the database includes the topic, number of items, target population, completion time, scoring method, languages, literacy level, validation notes, and cost.⁶⁵

SCREENING

TABLE 2. RECOMMENDED SCREENING INSTRUMENTS AND USAGE FOR THE EXPANDED MODEL OF PEDIATRIC CARE

Topic		Who is being screened	Frequency	Tools	Notes and Recommendations
Parenting Support		Parent	Every well-child visit	SEEK Whole Child Assessment	There are validated tools that assess parenting challenges such as SEEK and the Whole Child Assessment, but these screening tools are long and include many additional measures. To avoid screening fatigue, practices may want to include a checklist of specific common parenting challenges and ask parents to select items that they would like to discuss. In addition, it is helpful to include an open-ended question so that parents can ask about additional questions, challenges, or concerns, such as, "What is your main concern about your child's behavior and development?"
Social Determinants of Health (SDH)		Parent	Annually per family	We Care IHELLP SEEK Whole Child Assessment PRAPARE	Many SDH screening tools are available on the AAP's Screening Tool Finder. Practices may need to modify screening instruments to screen only for those SDH they can address. When possible, practices should use validated screening tools and/or questions.
Family Care	Family planning	Mothers, under age 50	Every well-child visit	One Key Question	
	Tobacco use	Parent	Annually	SDH screening instruments	Questions on tobacco use are included in some of the SDH screening tools.
	Postpartum depression	Mother	Infant's 2-week, 2-month, 4-month, 6-month, and 9-month well-child visits	EPDS	
	Depression	Parent	Annually, beginning at 12-month well-child visit	SDH screening instruments PHQ-2	Some SDH screening tools include questions about parental depression. We recommend using the PHQ-2 if the practice is not using an SDH screening that covers parental depression.
	Targeted Immunizations	Parent	Every well-child visit 0 - 6 months for Tdap and 0-12 months for influenza	Have you received your Tdap/flu vaccine?	Screening for immunizations should continue annually for children with complex medical needs.
Child Development	Developmental screening	Parent	9-month, 18-month, 24-month, 30-month, 36-month, and 48-month well-child visit	ASQ Peds	
	Autism spectrum disorder	Parent	18 month and 24 month well-child visit	MCHAT	
Behavioral Health	Psychosocial/behavioral assessment	See notes	Every well-child visit, beginning at age 5	Ages 5 - 6: ASQ-SE Ages 7 -10: PSC-17 Ages 11 -18: PSC-17 + PSC-Y	Parents should complete the ASQ-SE and PSC-17. The child should complete the PSC-Y.
	Tobacco, alcohol, or drug use	Child	Every well-child visit, beginning at age 11	CRAFFT HEADSS	Provider should perform screening without parents or others in the room.
	Depression and anxiety	See notes	Every well-child visit, beginning at age 7	Ages 7 -10: PSC-17 Ages 11 -18: PSC-17 + PSC-Y or PHQ-9A	Parents should complete the PSC-17. The child should complete the PSC-Y and PHQ-9A.

Note: All screenings should be completed before the visit or at the beginning of the visit. All positive screens should be addressed with the patient or family by the provider or social worker.

The Tufts Medical Center's Survey of Well-being of Young was identified by several key informant interviewees as a useful screening tool that addresses child development, parenting, SDH, family care, and behavioral health. However, Medicaid does not currently reimburse practices for the use of this screening tool in Texas.

CASE STUDIES

Innovative pediatric practices across the country are implementing some of the components in this model. A few examples include:

Beech Acres Parenting Center and Parent Connex (Cincinnati, Ohio)

Beech Acres Parenting Center, a non-profit agency dedicated to strengthening parenting in Cincinnati, Ohio recognized that pediatricians would be strong partners in supporting parenting education. Beech Acres collaborated with the Mayerson Center for Safe and Healthy Children at Cincinnati Children's Hospital to develop Parent Connex. This program embeds parent coaches from the Beech Acres Parenting Center into 11 pediatric practices to mitigate factors that have a negative impact on long-term health. Parent Connex identifies families who would benefit from coaching by screening at well-child visits and through pediatrician referrals. Coaches then meet with parents for an average of three sessions that run 45 minutes to an hour each. Coaches use the Natural Strength Parenting™ framework to collaborate with parents to identify and meet their parenting goals. The Association of Maternal and Child Health Programs has deemed this a promising practice. More information about the program can be found [here](#).

Integrated Behavioral Health at the Texas Children's Health Plan Centers for Children and Women (Houston, Texas)

The Texas Children's Health Plan's (TCHP) Centers for Children and Women have been offering integrated behavioral health at their two sites for the past 5 years. The Centers for Children and Women employ a mid-level LBHP on their care team. The Centers universally screen all children and caregivers for behavioral health needs. The LBHP provides just-in-time consultations and therapy for mild to moderate behavioral health conditions in response to positive screens, pediatrician referrals, or parent concerns. The LBHP also provides HBAI services that support patients with physical health diagnoses that contain behavioral components, like managing asthma. This model is currently being piloted in five additional pediatric practices and an economic analysis is being conducted to evaluate the financial sustainability of integrating behavioral health into pediatric practices.

Social Determinants of Health, Integrated Behavioral Health, and Healthy Neighborhoods Healthy Families Initiative- Nationwide Children's Hospital (Columbus, Ohio)

Nationwide Children's Hospital serves families in central and southeast Ohio. The hospital's programs, which align with its strategic plan to address population health and wellness, include school-based care, integrated behavioral health, a maternal and infant taskforce partnership with the mayor's office, and a medical-legal partnership.

To address behavioral health, for example, Nationwide Children's Early Childhood Mental Health program works with partners across the community to reduce preschool expulsion rates. The program offers classroom consultations and trainings on child development and social and emotional learning to preschool teachers, administrators, and families.

Nationwide Children's Healthy Neighborhoods Healthy Families Initiative is likewise based on community partnerships. Its mission is to strengthen housing, education, health and wellness, workforce development, and neighborhood safety and accessibility. To achieve these goals, the program supports a fresh food market, helps local residents apply for housing-renovation grants, conducts workforce training seminars, and more. See Nationwidechildrens.org for more information.

OPERATIONALIZING THE MODEL

Every pediatric practice is unique, and a clinical assessment will need to be performed to identify the best way to implement this model in the pediatric practice. Pediatric practices will need to give special consideration to organizational readiness, practice type, staffing, staff buy-in, spacing, workflow, technology, and payment models.

ORGANIZATIONAL READINESS

A practice's readiness to change or willingness to expand the role of the pediatric practice must be considered to determine if the practice is ready to expand its scope. Organizational readiness is defined as "organization members' change commitment and change efficacy to implement organizational change" and is complex, multilevel and multifaceted. Many factors affect an organization's readiness for change, including how much members value the new model, whether they value the changes the model will require, and their feelings about existing work demands, resource availability, and situational factors.^{66,67} Research suggests that most pediatric practices agree that well-child care needs to change. In one survey of 502 pediatricians, a majority (55-60%) reported that "in an ideal system," non-physicians, such as nurse practitioners, would provide anticipatory guidance and developmental and psychosocial screenings during well-child checks.⁶⁸ Another study conducted in a community health center setting identified a lack of time for parent education and anticipatory guidance during the well-child check.⁶⁹ This study proposed that the community health center adopt a team-based approach, which included using health educators to improve care delivery.⁶⁹ While just a few examples, these studies suggest that providers and clinic staff may be open to changes in the delivery of pediatric care.

Identifying one or two champions of change among staff members could help clinics achieve large-scale buy-in. These champions could act as liaisons between the clinic staff and community partners, oversee clinic space, and help with time management.⁷⁰

TYPES OF PRACTICES

There are several different types of pediatric practices—including federally qualified health centers (FQHCs), small independent pediatric practices, and practices within pediatric-practice networks— and the type of practice may affect the ease of implementation of this model.

Federally Qualified Health Centers

FQHCs are community-based health centers that receive federal funding to deliver medical care in underserved communities. FQHCs are subject to federal requirements, some of which align with the expanded model of pediatric care. For example, FQHCs are overseen by a governing board, of which 51% of the members must be patients of the



FQHC.⁷¹ This requirement aligns with the community engagement component of the model, as the patients of the practice are actively involved in the governance of the clinic. FQHCs are also required to offer primary care for adults, which fits nicely with our model's family-medical-care components. Finally, FQHCs are required to offer behavioral health, which also aligns with our model. Despite being well-positioned to adopt some of our model's components, FQHCs have reported challenges in adopting it as a whole. In particular, some FQHC interviewees expressed concern about their ability to offer additional services while maintaining the pediatric patient volume expected of them.

Small independent pediatric practices

Independent pediatric practices are owned by a single provider or a few providers. Independent pediatric practices have more autonomy to make changes to their pediatric practices, but assume more individual financial risk when they do so.⁷² Implementing new programs at small independent pediatric practices can also be more challenging because they have less support from ancillary departments such as legal, marketing, information technology, and billing. These practices tend to have less access to expensive, comprehensive electronic health record systems, which would make some components of our model more difficult to implement.

Pediatric practice networks

Individual practices that are part of pediatric practice networks have less autonomy to make practice changes but more support from legal, marketing, information technology, and billing departments. Pediatric practices in large networks are also more likely to have access to comprehensive electronic health systems.

STAFFING

To expand the role of pediatric practices, additional staffing will be required as most pediatric practices have limited capacity to take on additional initiatives without dedicated staff time. Key to this model is that it does not increase the workload of the pediatrician, but increases the staffing and resources so that the pediatric practice is able to better serve their patient population.

Nurse home visitor

An additional staff member will be needed to conduct the universal home visitation program. Some home visitation programs, including the recommended Family Connects, require that the home visitor be a registered nurse.

Social worker

Social workers, or similarly trained professionals, will be needed for the parenting and child development, SDH, and family care components. It is recommended that one social worker be hired per pediatrician. The practice should consider if the title "social worker" is the appropriate job title for this position as some communities have negative connotations with the term social worker and associate social workers with child welfare agencies and serving low-income populations. Practices may consider using different titles such as a Parenting Specialist, Family Coach, Health Coach, and Family Care Coordinator that are more acceptable to the community.

Licensed behavioral health provider

A LBHP is needed to provide the integrated behavioral health component of this model. Ideally, the LBHP should be a licensed clinical social worker (LCSW) or a licensed professional counselor (LPC), in order to bill Medicaid.

Community health coordinator

If a practice chooses to adopt all or most of the core components, the practice may want to consider adding a community health coordinator to supplement the work of the social worker. The community health coordinator would be responsible for helping families connect with needed social and medical services. Coordination with medical and social services can be very time consuming for families with extensive unmet social and medical needs.

Community liaison

In order for the pediatric practice to truly integrate into the community and be able to address community health needs, a community liaison is needed. The community liaison maintains partnerships with local schools, early childcare centers, social service agencies, and local coalitions to address community health concerns. The community liaison is also responsible for maintaining partnerships and accurate information on community resources to address the social and medical needs of families.

Reception and front office staff

To expand the role of the pediatric practice, the practice may need to consider hiring additional front-office staff to support the increase in programs, appointments, phone calls, and services.

ACHIEVING STAFF BUY-IN

In addition to hiring new staff, practices must achieve buy-in from current staff before implementation of the new model. Additions to existing roles and workflows for staff can create concerns about increased time burdens and not enough capacity in their likely already busy workday. Building buy-in early on is critical. Ideally staff input is solicited up front when selecting components of the model. To help achieve buy-in, we recommend re-orienting staff to the clinic's mission, describing the rationale for the changes in connection to the mission, providing evidence of the benefits of the new model, and including examples or testimonials from patients that would benefit from the new components. For workflow changes, soliciting input from staff from the beginning and throughout the transition phase (i.e., through a formal workgroup) will ensure changes can be incorporated in the most effective and least disruptive way. Feedback mechanisms should similarly be agreed upon (i.e., measures, frequency, consequences, etc.). Any significant changes to a clinic need a transition period, and creating a supportive and open environment is critical for success.

SPACE CONSIDERATIONS

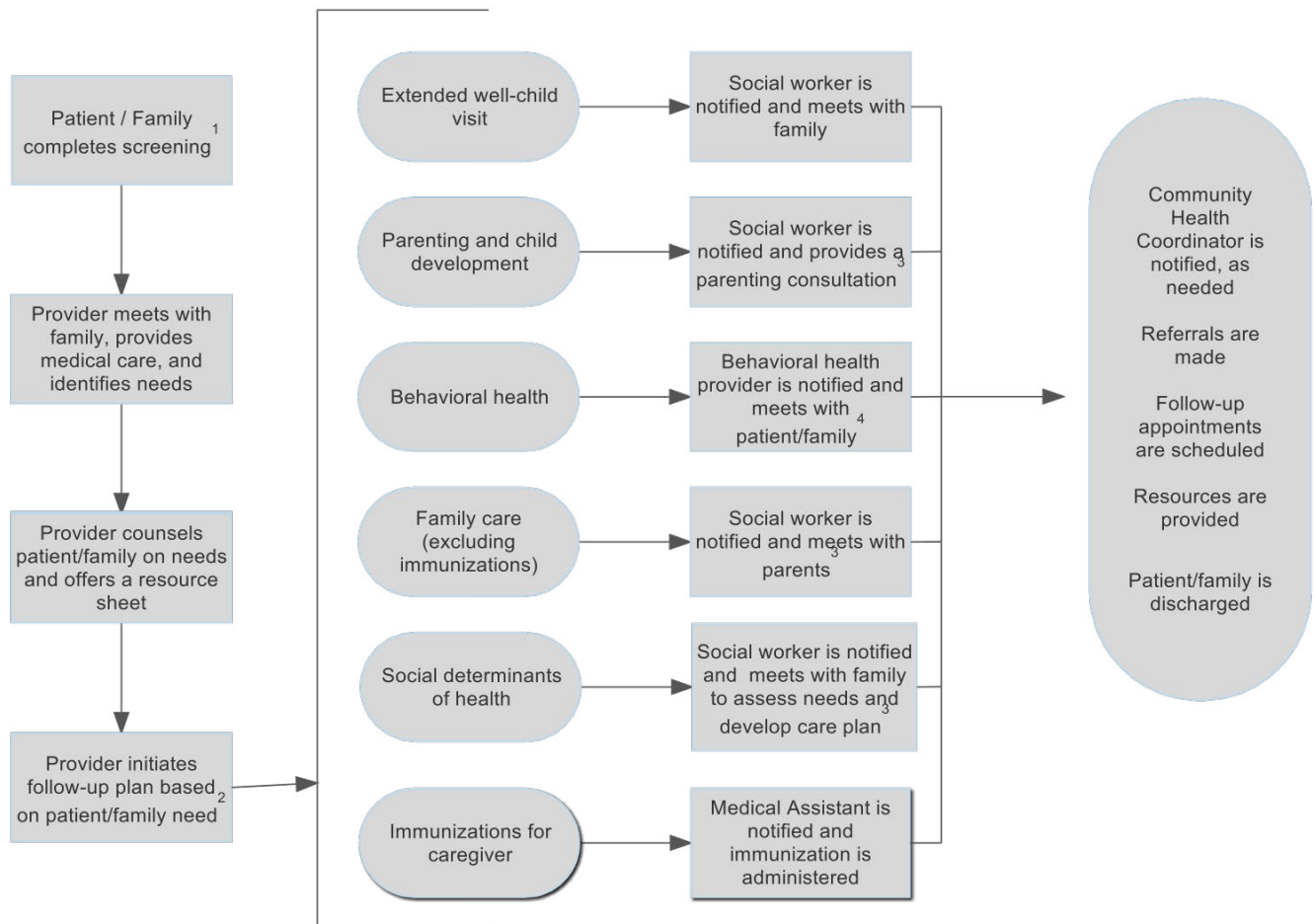
The availability of space must also be considered before implementing this model. During the development of this model, a common concern voiced by pediatric practices was the lack of space to implement the recommendations in this model. Many pediatric practices noted that they did not have extra rooms to implement the core components.

However, in many pediatric practices, patients spend quite a bit of time in the patient room while waiting to be seen by the provider. Patient flow analyses can be performed to streamline workflow and maximize active provider-patient interaction time in the exam room. Patient flow analyses are a quality improvement tool that are often used in resource-limited settings that help inform improvements to service delivery through flow mapping and cycle-time measurements. In instances where pediatric practices do not have rooms available for additional services, the services by the LBHP and social worker can be conducted in the existing exam rooms for a more efficient workflow where families spend less time waiting in the exam rooms. For example, a recent patient flow analysis of 6 pediatric practices in Houston revealed that, on average, families spent 15 minutes in the patient rooms waiting for providers or medical staff. With a more efficient workflow, this time could be used to provide additional services. Exam rooms become a more flexible, private space in which the patient can meet with multiple staff or service providers during a single visit, which decreases passive waiting times in the patient experience. In this way we anticipate a clinic may be able to accommodate additional service staff and increase efficiency without adding additional exam rooms.

WORK FLOW

The workflow is another factor that must be planned for when operationalizing this model of pediatric care. The workflow of a pediatric practice is the process in which a patient moves through the practice from start to finish. As pediatric practices adopt new components, the workflow of the practice has to be revised to accommodate the additional services. The workflow of pediatric practices often varies due to space variations; available technology, resources, and staff; and provider preferences. Figure 2 provides a high-level overview of a potential workflow for a well-child visit with the additional components.

Figure 2. Overview of the Clinic Workflow of the Pediatric Practice



1. Screenings can be completed before the visit, in the waiting room, or in the patient room.
2. Patients and families can choose to opt-out of additional services and the follow-up plan will be individualized based on the needs of the specific patient/family.
3. If the social worker is unavailable, a follow-up appointment will be scheduled.
4. If the behavioral health provider is unavailable, a follow-up appointment will be scheduled. If the behavioral health needs are urgent, a referral to the emergency room will be made if needed.

TECHNOLOGY

As we work to redefine the role of pediatric practices to be more integrated with the community, technology has an increasingly important role that allows for improved collection and communication of information. For example, over the past few years there has been a rapid emergence of community resource referral platforms that strive to help healthcare providers connect patients with community resources.⁷³ These platforms make it easier for providers to stay abreast of available services and in some cases allows for “close looped referrals” in which the community organizations are able to communicate back to the pediatric practice the outcome of the referral. Another example is telehealth, which enables patients to receive clinical services and health education via telecommunication technologies such as video conferencing.⁷⁴ Telehealth is especially critical for pediatric practices that serve families with transportation barriers or in rural communities where needed specialists may be located hundreds of miles away. Pediatric practices are also adopting systems that allow patients and their families to schedule appointments online and communicate directly with providers by secure online messaging.



While a comprehensive review of available technology for pediatric practices is beyond the scope of this report, technological advances should be considered, as they provide pediatric practices opportunities to improve communication with patients and community partners, collect information more effectively, reduce barriers to care for patients, and save time in the office.

PAYMENT MODELS

Finally, before implementing this model, practices should consider payment models and opportunities to negotiate payment agreements that are aligned with this model. Currently, most pediatric practices (not including FQHCs) receive reimbursement for the care of patients through a traditional “fee-for-service” model in which providers are reimbursed for specific services provided at pre-negotiated rates. While some of the additional components in this model can be reimbursed for by health insurance companies, many components will not be covered and either must be supported by the pediatric practice or through philanthropy.

However, Texas Medicaid and other insurers are in the early stages of adopting alternative payment models that reward high-quality outcomes. Options include:⁷⁵

- Pay-for-performance: Practices receive bonuses from payors for meeting quality metrics such as percent of patients who are up to date on immunizations at the age of 2 years.
- Shared savings: Providers and payors share the savings associated with meeting quality metrics and reduced healthcare spending.
- Shared risk: In shared-risk models, providers receive performance-based incentives, but they also must share the excess costs of healthcare delivery. Providers and payors agree on a budget and outcomes, and providers must cover a portion of the costs if the targets are not achieved.
- Population-based payments (capitation model): Practices receive per-member per-month payments from payors to provide comprehensive care to patients. Practices take on 100% of the risk and are responsible for covering all healthcare expenses for their patients.

Alternative payment models that prioritize high-quality outcomes may be a better fit with our proposed model of pediatric care than the traditional fee-for-service model, especially if the outcomes and metrics are closely aligned with the components of this model. However, one challenge with this model is that the expected savings are not isolated to the healthcare system and some of the potential savings are captured in other systems such as education, child welfare, juvenile and criminal justice. This is discussed in detail in the next section of this report.

ECONOMIC ANALYSIS OF THE MODEL

To understand the economic benefits of investing in children, families, and the community through the pediatric practice, we conducted an economic analysis of the core components of the model based on two practice types: practices that primarily serve patients with Medicaid (PMP) and practices that primarily serve patients with commercial insurance (PCIP). The economic analysis assumes at the PMP clinic, 75% of patients are covered by Medicaid and a pediatrician has a panel of 2027 patients. At the PCIP clinic, it is assumed that 72% of the patients have commercial insurance and a pediatrician has a panel size of 2822 patients. The full economic analysis of the model is available in Appendix D.

It is estimated that the core components would cost approximately \$963,000 in the first year and \$821,000 in subsequent years at a pediatric practice with 3 providers.

The economic cost-benefit analyses demonstrated an expected mean net benefit, across all stakeholders, for year one between \$3.6 million and \$6.4 million for a PMP clinic and between \$5.1 million and \$8.6 million for a PCIP practice. In subsequent years, the expected mean net benefit, across all stakeholders, increases to between \$3.8 million and \$6.6 million for a PMP clinic and between \$5.2 million and \$8.7 million for a PCIP practice.

The expected economic benefits accrue to multiple stakeholders, including the pediatric practice, the health plan insurer, school districts, criminal justice systems, child welfare, and social service agencies.

Estimates in expected revenues and cost savings are based on published rates; rates derived from large populations over long-range time periods. Thus, to realize the projected benefits requires implementing the proposed core components across a large population and providing these services over a significant period of time. Implementing the core components in a smaller number of clinics would allow for confirming the economic model assumptions; however, it is unlikely the full benefits shown in these analyses would be realized. Confirmation of projected economic outcomes would require full-scale implementation.

Our economic analysis demonstrates a potential for substantial societal savings. However, the large majority of the potential savings is realized outside of the pediatric practice, while the majority of the expenses are accrued by the pediatric practice. As a result, with the current payment systems, pediatric practices are unlikely to be able to cover the expenses of an expanded model on their own. In order to implement the proposed expanded model, it would likely require external investment or a different payment system.



EVALUATION OF THE MODEL

The overall goal of the expanded pediatric practice is to improve the health, well-being, and development of children and families through a new service delivery model of expanded universal and targeted services. To measure if this new model results in the desired outcomes, a comprehensive evaluation is needed. While the exact evaluation plan will vary between practices depending on which components of the model are selected and the availability of data, our evaluation plan is centered on three overarching questions:

Does the model increase identification of and access to a wider scope of services to improve health, well-being, and development of children and families?

Does the model improve health outcomes and well-being for children, families, and communities, including clinical health and social outcomes, and satisfaction with care?

Is the model financially sustainable?

A detailed evaluation framework is available in Appendix E. It includes a logic model for each evaluation question with potential process measures, short- and long-term outcomes, and a description of what is needed for data collection, data analysis, and reporting. A template that guides practices on the aspects that should be considered for each measure of the evaluation can be found in Appendix F.



POLICY AND SUSTAINABILITY

Expanding the role of pediatric practices will require an initial philanthropic investment. However, there may be statewide policy changes that would make the expanded model of pediatric care more financially sustainable for pediatric practices. Some opportunities for consideration include:

HIGHER REIMBURSEMENT RATES FOR LICENSED CLINICAL SOCIAL WORKERS

In this model, social workers offer some of the expanded services, including behavioral health assessments and counseling, SDH assessments and counseling, and parenting consultations. Some of these services are reimbursable by Medicaid if done by LPCs or LCSWs, but in Texas, LCSWs and LPCs are reimbursed at 70% of the rate of psychologists and psychiatrists.⁷⁶ This model would be more financially sustainable if social workers were reimbursed at higher rates and if they were reimbursed for a broader array of services such as wrap around services, described below.

REIMBURSEMENT FOR WRAP AROUND SERVICES

In our model, the pediatric practice will assist families in following-up with referrals to address SDH, select family medical care, behavioral health, and medical needs. Oftentimes these wrap around services can be time consuming but are critically important for the health and well-being of patients and their families, especially for parents with low literacy and non-English speakers. It has been widely acknowledged that lack of wrap around services and care coordination contributes to cost inefficiencies and poor health outcomes.⁷⁷ Some wrap around services are currently reimbursed by Medicaid for specific vulnerable populations, but only if it is provided by a physician or mid-level provider (Nurse Practitioner, Clinical Nurse Specialist, and Physician's Assistant).⁷⁸ However, in our model, along with many other healthcare systems in Texas, wrap around services are often provided by other staff. Allowing other practice staff to bill for wrap around services would support the financial sustainability of this model and allow the provider to focus on clinical rather than administrative tasks.

RESTRUCTURING THE WELL-CHILD VISIT REQUIREMENTS

Texas Health Steps regulates what services must be included in a well-child visit in order for a pediatric practice to be reimbursed by Medicaid in Texas.⁷⁹ As we expand the role of pediatric practices, there is an opportunity for pediatricians and child developmental specialists to review the Texas Health Step requirements and make recommendations to ensure the requirements are aligned with current pediatric and early brain science.

COVERING FAMILY CARE UNDER THE CHILD'S INSURANCE

In 2017, the Texas legislature passed HB2466 which requires Texas Medicaid to reimburse pediatric practices for screening mothers for postpartum depression.⁸⁰ The unique component of this bill is that the screening is billed through the child's Medicaid and not the mother's health insurance, in part because women lose Medicaid coverage 60 days after the delivery of a child.⁸¹ This model includes components of maternal and family care that directly impact the health of the child including immunizations, family planning, depression, and tobacco cessation. As a result, exploring opportunities for the pediatric practices to be able to bill the child's Medicaid to provide these parental services would not only make this model more financially sustainable, but also improve parental and child health through preventative family wellness interventions. This could be accomplished through a rider, which is an amendment to an insurance policy that can add specific coverages.⁸² Including a parental insurance rider on the child's Medicaid would ensure the health of the caregivers as a component of the child's health and well-being.

INVESTING IN ALTERNATIVE PAYMENT MODEL

One of the challenges with the financial sustainability of this model is that many of the financial savings are not realized by the healthcare system, but are realized in the education, child welfare, and criminal justice systems. Many public health investments are realized at the community level rather than the individual or health plan level. Furthermore, some of the savings are not realized until years after the initial investment is made. As a result, payment models including social impact bonds, shared saving plans, and value-based payments need to be explored to help cover the required initial investment to invest in children's health, development, and well-being. While Medicaid Managed Care contracts have begun to require some value-based payment models, there is an opportunity to align the value-based payment models with the components and outcomes in this model that address parenting and child development, SDH, and maternal care. Other states have also implemented a compliance monitoring strategy with a low percentage capitation withholding on Medicaid reimbursement,⁸³⁻⁸⁵ or have used novel blended or braided funding streams.⁸³⁻⁸⁶

DATA SHARING ACROSS AGENCIES

Currently data systems among Texas are siloed and not linked across sectors and agencies. There is a need for stronger linkages between social service agencies and healthcare records. While there has been a rapid emergence of community resource referral platforms and health information exchange networks, data sharing across agencies and between platforms remains challenging. Many of the community resource referral platforms do not integrate with electronic medical records and with so many different platforms available, it would be difficult for community organizations to manage.

Enhanced data linkage across Texas agencies are also needed to track and improve outcomes from this model, along with other promising models across systems. Sharing outcomes and data linking between the health care, education, or criminal justice systems allows tracking of long-term prospective outcomes from certain interventions and experiences, and allows policymakers to ensure appropriate funding streams.⁸⁷

Data sharing may also enable state's health plans to leverage public group-purchasing power to acquire lower rates for certain carved-out health services such as pharmaceuticals, vision, and dental; as well as engage in chronic disease managed care to lower costs.^{88,89}



CONCLUSION

The first 3 years of a child's life provides the foundation for lifelong learning, health, and well-being. Pediatric practices are well positioned to extend their sphere of influence beyond the walls of the pediatric practice to promote early brain development, healthy children, stable families, and thriving communities. With 33% of children in our community living below the federal poverty line, 60% of third grade students failing standardized reading proficiency test, and 57% of children ages 3 and 4 not enrolled in school, our community must invest in bold solutions to provide young families with necessary skills, resources, social capital, and knowledge.⁹⁰ The blueprint described in this report provides pediatric practices with a menu of strategies they can adopt based on the needs and assets available in their local community and practice. By investing in parenting and child development, behavioral health, family medical care, SDH and community engagement, pediatric practices are able to leverage the frequent contact, trust, and respect they have with families to help the next generation thrive.



REFERENCES

1. Knickmeyer RC, Gouttard S, Kang C, et al. A structural MRI study of human brain development from birth to 2 years. *J Neurosci*. 2008;28 (47):12176-12182.
2. Center on the Developing Child. In brief: the science of Early childhood development. <https://developingchild.harvard.edu/resources/inbrief-science-of-ecd/>. Harvard University. Accessed November 1, 2019.
3. Centers for Disease Control and Prevention. Early brain development and health. <https://www.cdc.gov/ncbddd/childdevelopment/early-brain-development.html>. Accessed November 1, 2019.
4. American Academy of Pediatrics. AAP schedule of well-child care visits.- <http://www.healthychildren.org/English/family-life/health-management/Pages/Well-Child-Care-A-Check-Up-for-Success.aspx/>. Accessed November 1, 2019.
5. Schippers V. No preschooler left behind: the need for high quality early intervention for children born into poverty. *Multicultural Educ*. 2014;22(1):41-45.
6. Center on the Developing Child. Serve and return. <https://developingchild.harvard.edu/science/key-concepts/serve-and-return/>. Harvard University. Accessed November 1, 2019.
7. Murphey D, Beckwith S. A parent's health is one of the strongest predictors of a child's health. <https://www.childtrends.org/a-parents-health-is-one-of-the-strongest-predictors-of-a-childs-health>. *Child Trends* blog. Published January 9, 2019. Accessed November 1, 2019.
8. Tanner EM, Finn-Stevenson M. Nutrition and brain development: social policy ilmplications. *Am J Orthopsychiatry*. 2002;72(2):182-193.
9. Conroy K, Rea C, Kovacikova GI, et al. Ensuring timely connection to early intervention for young children with developmental delays. *Pediatrics*. 2018;142(1).
10. Tierney AL, Nelson CA III. Brain development and the role of experience in the early years. *Zero Three*. 2009;30(2):9-13.
11. Hambrick EP, Brawner TW, Perry BD. Timing of early-life stress and the development of brain-related capacities. *Front Behav Neurosci*. 2019;13:183.
12. Haas Institute. Targeted universalism. <https://haasinstitute.berkeley.edu/targeted-universalism>, Accessed November 1, 2019.
13. National Institutes of Health. Principles of Community Engagement. 2nd ed. <https://www.atsdr.cdc.gov/communityengagement/>. CTSA Community Engagement Key Function Committee Task Force on the *Principles of Community Engagement*. Accessed November 1, 2019.
14. Braveman P, Gottlieb L. The social determinants of health: it's time to consider the causes of the causes. *Public Health Rep*. 2014;129(suppl 2):19-31.
15. Bronfenbrenner U, Morris PA. The ecology of developmental processes. In: Damon W, Lerner RM, eds. *Handbook of Child Psychology: Theoretical Models of Human Development*. 5th ed. 1998;1:993-1028. Hoboken, NJ: John Wiley & Sons Inc
16. Well-child visits. *Child Trends*. <https://www.childtrends.org/indicators/well-child-visits>. Published December 27, 2018. Accessed November 1, 2019.
17. Cates CB, Weisleder A, Mendelsohn AL. Mitigating the effects of family poverty on early child development through Parenting interventions in primary care. *Acad Pediatr*. 2016;16(3)(suppl):S112-S120.

18. Schilling S, French B, Berkowitz SJ, Dougherty SL, Scribano PV, Wood JN. Child-adult relationship enhancement in primary care (PriCARE): a randomized trial of a parent training for child behavior problems. *Acad Pediatr*. 2017;17(1):53-60.
19. Barlow J, Parsons J, Stewart-Brown S. Preventing emotional and behavioural problems: the effectiveness of parenting programmes with children less than 3 years of age. *Child Care Health Dev*. 2005;31(1):33-42.
20. Prinz RJ, Sanders MR, Shapiro CJ, Whitaker DJ, Lutzker JR. Addendum to "Population-based prevention of child maltreatment: the U.S. Triple P System Population Trial". *Prev Sci*. 2016;17(3):410-416.
21. Sanders MR, Markie-Dadds C, Turner KMT. Theoretical, scientific and clinical foundations of the Triple P-Positive Parenting Program: a population approach to the promotion of parenting competence. *Parenting Res Pract Monogr*. 2003;1:1-24.
22. Mendelsohn AL, Huberman HS, Berkule SB, Brockmeyer CA, Morrow LM, Dreyer BP. Primary care strategies for promoting parent-child interactions and school readiness in at-risk families: the Bellevue Project for Early Language, Literacy, and Education Success. *Arch Pediatr Adolesc Med*. 2011; 165(1):33-41.
23. Kalil A. Inequality begins at home: the role of parenting in the diverging destinies of rich and poor children. In: Amato P, Booth A, McHale SM, Van Hook J, eds. *Families in an Era of Increasing Inequality*. National Symposium on Family Issues. New York, NY: Springer; 2015;5
24. Behavioral Health Treatments and Services | SAMHSA - Substance Abuse and Mental Health Services Administration. <https://www.samhsa.gov/find-help/treatment>. Accessed September 9, 2019.
25. Murphey D, Stratford B, Gooze RA, et al. *Are the Children Well? A Model and Recommendations for Promoting the Mental Wellness of the Nation's Young People*. Princeton, NJ: Robert Wood Johnson Foundation; 2014.
26. Merikangas KR, Ames M, Cui L, et al. The impact of comorbidity of mental and physical conditions on role disability in the US adult household population. *Arch Gen Psychiatry*. 2007;64(10):1180-1188.
27. Pascoe JM, Wood DL, Duffee JH, Kuo A. Mediators and adverse effects of child poverty in the United States. *Pediatrics*. 2016;137(4).
28. Office of the Surgeon General, National Institute of Mental Health. Mental health: culture, race, and ethnicity: a supplement to mental health: a report of the Surgeon General. Substance Abuse and Mental Health Services Administration; 2001.
29. Yogman MW, Betjemann S, Sagaser A, Brecher L. Integrated behavioral health care in pediatric primary care: a quality improvement project. *Clin Pediatr*. 2017;57(4):461-470.
30. Earls MF, Yogman MW, Mattson G, Rafferty J, American Academy of Pediatrics Committee on Psychosocial Aspects of Child and Family Health. Incorporating recognition and management of perinatal depression into pediatric practice. *Pediatrics*. 2019;143(1):e20183259.
31. Slomski A. Chronic mental health issues in children now loom larger than physical problems. *JAMA*. 2012;308(3):223-225.
32. Benzer JK, Beehler S, Miller C, et al. Grounded theory of barriers and facilitators to mandated implementation of mental health care in the primary care setting. *Depress Res Treat*. 2012;2012::597157.
33. Benzer JK, Beehler S, Miller C, et al. Grounded theory of barriers and facilitators to mandated implementation of mental health care in the primary care setting. *Depress Res Treat*. 2012;2012::597157.
34. Bishop TF, Press MJ, Keyhani S, Pincus HA. Acceptance of insurance by psychiatrists and the implications for access to mental health care. *JAMA Psychiatry*. 2014;71(2):176-181.
35. Earls MF, Yogman MW, Mattson G, Rafferty J, American Academy of Pediatrics Committee on Psychosocial Aspects of Child and Family Health. Incorporating recognition and management of perinatal depression into pediatric practice. *Pediatrics*. 2019;143(1):e20183259.

36. Center on the Developing Child. The foundations of lifelong health are built in early childhood. <https://developingchild.harvard.edu/resources/the-foundations-of-lifelong-health-are-built-in-early-childhood/>. Harvard University. Published 2010. Accessed November 1, 2019.
37. Brundage SC, Shearer C. Plan and provider opportunities to move toward integrated family health. <https://uhfnyc.org/publications/publication/plan-and-provider-opportunities-move-toward-integrated-family-health/>. United Health Fund. Published March 21, 2019. Accessed November 1, 2019.
38. Lessin HR, Edwards KM. Immunizing parents and other close family contacts in the pediatric office setting. *Pediatrics*. 2012;129(1):e247.
39. Hasin DS, Sarvet AL, Meyers JL, et al. Epidemiology of adult DSM-5 major depressive disorder and its specifiers in the United States. *JAMA Psychiatry*. 2018;75(4):336-346.
40. Pratt LA, Brody DJ. *Depression in the U.S. household population, 2009-2012*. 2014. 1941-4935.
41. Singla DR, Kumbakumba E, Aboud FE. Effects of a parenting intervention to address maternal psychological wellbeing and child development and growth in rural Uganda: a community-based, cluster randomised trial. *Lancet Glob Health*. 2015;3(8):e458-e469.
42. Stein A, Malmberg LE, Sylva K, Barnes J, Leach P. The influence of maternal depression, caregiving, and socioeconomic status in the post-natal year on children's language development. *Child Care Health Dev*. 2008;34(5):603-612.
43. Rosen LJ, Noach MB, Winickoff JP, Hovell MF. Parental smoking cessation to protect young children: a systematic review and meta-analysis. *Pediatrics*. 2012;129(1):141-152.
44. Farber HJ, Walley SC, Groner JA, Nelson KE, American Academy of Pediatrics Section on Tobacco Control. Clinical practice policy to protect children from tobacco, nicotine, and tobacco smoke. *Pediatrics*. 2015;136(5):1008-1017.
45. Lepore SJ, Winickoff JP, Moughan B, et al. Kids Safe and Smokefree (KiSS): a randomized controlled trial of a multilevel intervention to reduce secondhand tobacco smoke exposure in children. *BMC Public Health*. 2013;13:792.
46. Babb S, Malarcher A, Schauer G, Asman K, Jamal A. Quitting smoking among adults--United States, 2000-2015. *MMWR Morbid Mortal Wkly Rep*. 2017;65(52):1457-1464.
47. Blood-Siegfried J, Rende EK. The long-term effects of prenatal nicotine exposure on neurologic development. *J Midwifery Womens Health*. 2010;55(2):143-152.
48. Skoff TH, Kenyon C, Cocoros N, et al. Sources of infant pertussis infection in the United States. *Pediatrics*. 2015;136(4):635.
49. Abu Raya B, Edwards KM, Scheifele DW, Halperin SA. Pertussis and influenza immunization during pregnancy: a landscape review. *Lancet Infect Dis*. 2017;17(7):e209-e222.
50. American Academy of Pediatrics Committee on Infectious Diseases. Recommendations for prevention and control of influenza in children, 2018-2019. *Pediatrics*. 2018;142(4):e20182367.
51. Zuckerman B, Nathan S, Mate K. Preventing unintended pregnancy: a pediatric opportunity. *Pediatrics*. 2014;133(2):181-183.
52. Upadhyia KK, Burke AE, Marcell AV, Mistry K, Cheng TL. Contraceptive service needs of women with young children presenting for pediatric care. *Contraception*. 2015;92(5):508-512.
53. Allen D, Hunter MS, Wood S, Beeson T. One Key Question: First things first in reproductive health. *Matern Child Health J*. 2017;21(3):387-392.
54. American Academy of Pediatrics Section on Breastfeeding. Breastfeeding and the use of human milk. *Pediatrics*. 2012;129(3):e827-e841.

55. Cleland J, Conde-Agudelo A, Peterson H, Ross J, Tsui A. Contraception and health. *Lancet*. 2012;380(9837):149-156.
56. Belfort MB. The science of breastfeeding and brain development. *Breastfeed Med*. 2017;12(8):459-461.
57. World Health Organization. Social determinants of health. https://www.who.int/social_determinants/en/. Accessed November 1, 2019.
58. Artiga S, Hinton E. Beyond health care: the role of social determinants in promoting health and health equity. <https://www.kff.org/disparities-policy/issue-brief/beyond-health-care-the-role-of-social-determinants-in-promoting-health-and-health-equity/>. Kaiser Family Foundation. Published May 10, 2018. Accessed November 1, 2019.
59. Blair C, Granger DA, Willoughby M, et al. Salivary cortisol mediates effects of poverty and parenting on executive functions in early childhood. *Child Dev*. 2011;82(6):1970-1984.
60. Singh GK, Siahpush M, Kogan MD. Neighborhood socioeconomic conditions, built environments, and childhood obesity. *Health Aff (Millwood)*. 2010;29(3):503-512.
61. Gottlieb LM, Hessler D, Long D, et al. Effects of social needs screening and in-person service navigation on child health: a randomized clinical trial. *JAMA Pediatr*. 2016;170(11):e162521.
62. Luby J, Belden A, Botteron K, et al. The effects of poverty on childhood brain development: the mediating effect of caregiving and stressful life events. *JAMA Pediatr*. 2013;167(12):1135-1142.
63. Jimenez ME, Barg FK, Guevara JP, Gerdes M, Fiks AG. The impact of parental health literacy on the early intervention referral process. *J Health Care Poor Underserved*. 2013;24(3):1053-1062.
64. American Academy of Pediatrics. The screening process. <http://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Screening/Pages/The-Screening-Process.aspx>. Accessed November 1, 2019.
65. American Academy of Pediatrics. Screening tools. <https://screeningtime.org/star-center/#/screening-tools#top>. Accessed November 1, 2019.
66. Weiner BJ. A theory of organizational readiness for change. *Implement Sci*. 2009;4:67.
67. Holt DT, Helfrich CD, Hall CG, Weiner BJ. Are you ready? How health professionals can comprehensively conceptualize readiness for change. *J Gen Intern Med*. 2010;25(suppl 1):50-55.
68. Coker T, Casalino LP, Alexander GC, Lantos J. Should our well-child care system be redesigned? A national survey of pediatricians. *Pediatrics*. 2006;118(5):1852-1857.
69. Mooney K, Moreno C, Chung PJ, Elijah J, Coker TR. Well-child care clinical practice redesign at a community health center: provider and staff perspectives. *J Primary Care Community Health*. 2014;5(1):19-23.
70. Beck AF, Tschudy MM, Coker TR, et al. Determinants of health and pediatric primary care practices. *Pediatrics*. 2016;137(3):e20153673.
71. What is an FQHC? <https://www.fqhc.org/what-is-an-fqhc>. Accessed November 1, 2019.
72. American Academy of Pediatrics. Practice transformation. <http://www.aap.org/en-us/professional-resources/practice-transformation/Pages/practice-transformation.aspx>. Accessed November 1, 2019.
73. Episcopal Health Foundation. Community resource referral platforms: a guide for health care organizations. <https://www.episcopalhealth.org/en/research/research-reports/community-resource-referral-platforms-guide-health-care-organizations/>. Published April 16, 2019. Accessed November 1, 2019.
74. Office of the National Coordinator for Health Information Technology. What is telehealth? How is telehealth different from telemedicine? <https://www.healthit.gov/faq/what-telehealth-how-telehealth-different-telemedicine>. Accessed November 1, 2019.

REFERENCES

75. VBP White Paper-Pros and Cons. 2018; https://www.integration.samhsa.gov/about-us/innovation-communities-2018/VBP_Final.pdf. Accessed October 8, 2019.
76. Roser MA. Responding to a behavioral health care shortage. <https://www.tha.org/Publications/Texas-Hospitals-Magazine/Texas-Hospitals-March-April-2019/Behavioral-Health-Care-Shortage>. Texas Hospital Association. Accessed November 1, 2019.
77. Antonelli R, Mcallister, J, Popp, J. Making care coordination a critical component of the pediatric health system:a multidisciplinary approach. 2009; https://www.researchgate.net/publication/228816045_Making_care_coordination_a_critical_component_of_the_pediatric_health_system_a_multidisciplinary_framework.pdf. Accessed November 1, 2019.
78. Texas Medicaid Provider Procedures Manual: Behavioral Health and Case Management Services Handbook. http://www.tmhp.com/Manuals_PDF/TMPPM/TMPPM_Living_Manual_Current/2_Behavioral_Health.pdf. Published November 2019. Accessed November 1, 2019.
79. Texas Health Steps (THSteps). http://www.tmhp.com/Pages/Medicaid/Medicaid_THSteps_Program_Info.aspx. Accessed November 1, 2019.
80. Texas House Bill 2466. 85th Legislature (2017-2018). LegiScan. <https://legiscan.com/TX/bill/HB2466/2017>. Accessed November 1, 2019.
81. Texas Health and Human Services. Health care. How to get help. <https://yourtexasbenefits.hhsc.texas.gov/programs/health/women/pregnant>. Accessed November 1, 2019.
82. Rider (exclusionary rider). HealthCare.gov glossary. <https://www.healthcare.gov/glossary/rider-exclusionary-rider/>, Accessed November 1, 2019.
83. Walsh E. Financial alignment initiative Michigan MI Health Link first evaluation report. <https://www.cms.gov/Medicare-Medicaid-Coordination/Medicare-and-Medicaid-Coordination/Medicare-Medicaid-Coordination-Office/FinancialAlignmentInitiative/Downloads/MIEvalReport1.pdf>. Published August 2019. Accessed November 1, 2019.
84. Pettit CT, Cunningham JA, Grey CR. Calendar year 2019 MI Health Link Medicaid capitation rate certification. https://www.michigan.gov/documents/mdch/MI_Health_Link_Medicaid_Rate_Report_486947_7.pdf. Published June 17, 2019. Accessed November 1, 2019.
85. Lent M. Oklahoma uses an innovative funding opportunity to promote healthy child development through the Reach Out and Read program. <https://nashp.org/wp-content/uploads/2019/07/Oklahoma-HSI.pdf>. National Academy for State Health Policy. Published July 2019. Accessed November 1, 2019.
86. Clary A, Riley T. Braiding & blending funding streams to meet the health-related social needs of low-income persons: considerations for state health policymakers. <https://nashp.org/wp-content/uploads/2016/02/Jean1.pdf>. Published February 2016. Accessed November 1, 2019.
87. Putnam-Hornstein E, Needell B, Rhodes AE. Understanding risk and protective factors for child maltreatment: the value of integrated, population-based data. *Child Abuse Negl* 2013;37:116-119.
88. Horvath J, Schneiter E, Cousart C, Riley T, Hensley-Quinn M. Cross-agency strategies to curb health care costs: leveraging state purchasing power. <https://nashp.org/cross-agency-strategies-to-curb-health-care-costs-leveraging-state-purchasing-power/>. National Academy for State Health Policy. Published April 15, 2019. Accessed November 1, 2019.
89. Horvath J. State initiatives using purchasing power to achieve drug cost containment. https://nashp.org/wp-content/uploads/2019/04/Rx-Purchasing-Paper-Jane-Horvath-FINAL-4_9_2019.pdf. National Academy for State Health Policy. Published 2019. Accessed November 1, 2019.
90. Annie E. Casey Foundation. Kids Count data center. <https://datacenter.kidscount.org/>. Accessed November 1, 2019.

APPENDIX A

Interviews

In addition to meeting with many departments across the Texas Children's Hospital system, representatives from the following organizations were interviewed and provided input, expertise, and ideas for this model.

ABC Pediatric Clinic

AVANCE

Baylor College of Medicine

Beech Acres Parenting Center

Boston Center for the Urban Child and Healthy Family

Boston University School of Medicine

Children's Hospital of Philadelphia (CHOP) Policy Lab

Cincinnati Children's Hospital

Cincinnati Children's Hospital Medical-legal partnership

Episcopal Health Foundation

Family Care Connection of the Children's Hospital of Pittsburgh, University of Pittsburgh

Family Connects

Harris County Public Health

Houston Food Bank

George Mason University

Health Leads

Hope Clinic Houston

Johns Hopkins University Harriet Lane Clinic

Nationwide Children's Hospital

Parent Connex

People's Community Clinic

Rice University

Spring Branch Community Health Center

Texas Children's Medical-legal partnership

The Rales Health Center (Johns Hopkins Children's Center)

University of Connecticut School of Medicine

University of Houston

University of Texas System Administration -Population Health

University of Texas School of Public Health

APPENDIX B

Early Brain Development Programs, Trainings, and Resources for Pediatric Practices

EARLY BRAIN DEVELOPMENT

PROGRAMS FOR FAMILIES

upWORDS Program (Texas Children's Hospital) is a community-based primary prevention program focused on enhancing parent-child interaction and parents' engagement in their young child's development. The program is universally delivered in 14 one-hour sessions over 4 months in community settings throughout the Houston region to parents/caregivers of children between the ages of 0-24 months. The program utilizes a digital language processor device to provide feedback on the home language environment that the child is exposed to, which motivates the family to make goals to increase their interaction with their child.

Website: www.texaschildrens.org/upwords-program

The Houston Basics is a program for parents and grandparents of children birth-3 years old. The Houston Basics are five fun, simple, and powerful ways to help all our children become the happiest and most successful they can be. The Houston Basics videos can be shown in the waiting room and in clinic rooms for families of young children.

Website: www.cmhouston.org/houston-basics

Reach Out & Read (UT Health Children's Learning Institute) is an evidence-based, three-part model integrated into regular pediatric checkups. The components are 1) trained doctors and nurses speak with parents about the importance of reading aloud, starting in infancy, 2) the child receives a new book to take home at each regular checkup from 6 months to 5 years of age, and 3) the waiting room area is a literacy-rich environment with gently used books and/or volunteer readers that model techniques of reading aloud to young children.

Website: reachoutandreadtexas.org

Family Connects (Duke University) a universal nurse home-visiting model that includes one to three home visits by a registered nurse approximately 2 to 12 weeks after the child's birth, and follow-up contacts with families and community agencies to confirm families' successful linkages with community resources. Specific targeted outcomes include 1) increasing families' connections to community resources, 2) reducing child maltreatment investigations and substantiations, 3) reducing mother and infant use of emergency medical care, 4) improving the quality and safety of the home environment, 5) increasing positive parenting behaviors, 6) reducing parental anxiety and depression, and 7) improving use of high-quality child care when non-parental care is desired.

Website: www.familyconnects.org

Video Interaction Project (VIP) (New York University School of Medicine) is a relationship-based, individualized parent-child intervention administered to families concurrent with the well-child visit. During each VIP session, the parent and child (between ages 0-5 years) receive a half-hour of one-on-one support from a VIP interventionist. The interventionist delivers a curriculum focused on supporting interactions in the context of pretend play, shared reading, and daily routines--all shown to enhance child development and school readiness. A central part of VIP is a 5-minute video-recording session with feedback from the interventionist on parent-child interaction.

Website: www.videointeractionproject.org

EARLY BRAIN DEVELOPMENT

Healthy Steps (Zero to Three) is an evidence-based, interdisciplinary pediatric primary care program that promotes positive parenting and healthy development for babies and toddlers. The core components of the program are 1) child development, social-emotional, and behavioral screening, 2) screening for family needs, 3) child development support line, 4) child development and behavior consults, 5) care coordination and systems navigation, 6) positive parenting guidance and information, 7) early learning resources, and 8) ongoing, preventive team-based well-child visits.

Website: www.healthysteps.org

Centering Parenting (Centering Healthcare Institute) is a parent-centered group-care model for providing well-child care to address the needs of socioeconomically disadvantaged patient populations. Centering groups meet over the course of a year on an expanded schedule for 2-hour group visits that include an individual well-child check and group educational sessions on age-appropriate parenting and child development topics.

Website: www.centeringhealthcare.org/what-we-do/centering-parenting

Minding the Baby (Yale School of Medicine) is an integrated model of care that bridges primary care and mental health approaches to enhancing the mother-infant relationship. Clinicians are trained in supporting and enhancing parental reflective capacities. The program is focused on 1) enhancement of health, mental health, parent-child relationship/attachment, and life course outcomes within young families, 2) prevention at a very early stage of the family's development, and 3) home visiting as the primary intervention modality, beginning in pregnancy through the child's second birthday.

Website: medicine.yale.edu/childstudy/communitypartnerships/mtb/model/

TRAINING FOR PEDIATRIC PROVIDERS AND STAFF

Promoting First Relationships in Primary Care (University of Washington School of Nursing)

This handbook aims to help primary care pediatric providers support, nurture, and improve the relationships between young children and their parents. The focus of the curriculum is on early attachment and the relationship qualities that enhance social-emotional development.

Cost: \$115

Website: <https://www.pcrprograms.org/product/promoting-first-relationships-in-pediatric-primary-care>

Early Childhood Health Optimization Training for Pediatricians, OB/Gyns, Therapists, Care Coordinators, Behavioral Health, Home Visitors, and Practitioners (Florida State University Center for Prevention and Early Intervention Policy)

The purpose of this series of technical assistance materials is to address specific points of contact within the managed health care system and provide the practitioners with the necessary information to identify and treat these young children and their families. Information is tailored to each discipline on 1) awareness of toxic stress, 2) understanding and appreciation for infant and early childhood mental health, 3) screening and assessment, 4) basic practices that can be used to promote positive development, prevent or provide early interventions within the scope of practice of the discipline, 5) referral and linkages to specialty mental health providers when necessary, and 6) ways to integrate physical and behavioral health care.

Cost: Free

Website: cpeip.fsu.edu/mma/

EARLY BRAIN DEVELOPMENT

Early Brain and Child Development (EBCD) Education and Training Modules (American Academy of Pediatrics)

Six online modules provide the latest key information and resources on early brain development, toxic stress, adverse childhood experiences, parenting and how to be an advocate in your community.

Cost: Free

Website: www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/EBCD/Pages/educationModules.aspx

Brain Story Certification (Alberta Family Wellness)

This online course (19 modules) on the science of brain development is available to professionals and the public. Brain Story Certification is designed for those seeking a deeper understanding of brain development and its consequences for lifelong health.

Cost: Free

Website: www.albertafamilywellness.org/

The Growing Brain: From Birth to 5 Years Old, A Training Curriculum for Early Childhood Professionals (Zero to Three)

This train-the-trainer training (seven 3-hour units) focuses on giving trainers evidence-informed strategies with which to prepare early childhood providers for their vital role in building healthy brains. The curriculum includes an understanding of how the brain develops, along with ways the provider can encourage healthy brain development in children from birth to 5 years old. The skills and strategies that are taught are: 1) teaching early childhood providers about brain development (architecture and neurobiology) to inform their practice, 2) supporting language, cognition, prosocial behavior, and social-emotional development, and 3) reducing toxic stress that can negatively influence brain development of very young children.

Cost: Content available to Zero to Three Members (\$100/year)

Website: www.zerotothree.org/resources/1831-the-growing-brain-from-birth-to-5-years-old-a-training-curriculum-for-early-childhood-professionals

RESOURCES FOR PROVIDERS AND FAMILIES

CIRCLE Activity Collection: Family (UT Health Children's Learning Institute)

A collection of hands-on activities that families can do at home organized around seven learning domains: 1) language and communication, 2) reading and writing, 3) math, 4) science, 5) social and emotional, 6) physical development, and 7) art and sensory.

Website: cliengagementfamily.org

Books Build Connections Toolkit (American Academy of Pediatrics)

This toolkit has publications with information and tips for pediatric professionals and families. It encourages families to talk, read, and sing with their children.

Website: www.aap.org/en-us/literacy/Pages/default.aspx

Talk, Read, and Sing Together Every Day (U.S. Department of Education)

Tip sheets for families, caregivers, and early learning educators

Website: www.ed.gov/early-learning/talk-read-sing

Talking is Teaching: Talk, Read, Sing (Too Small to Fail)

Resources for simple tips and ideas on talking, reading, and singing with young children during everyday moments.

Website: Talkingisteaching.org/resources

APPENDIX C

Integrated Behavioral Health Training Tools

The following integrated behavioral health modules are available on the Texas Children's Health Plan's provider portal or by request. The purpose of these modules is to help pediatric practices offer integrated behavioral health.

- Integrating Behavioral Health Services: What Your Behavioral Health Specialist Can Do For You
- Medication Management of Pediatric Depression and Anxiety
- Medication Management of ADHD and Disruptive Behaviors
- Medication Management Decision Making – Conducting Risk Benefit Analysis When Considering Medication for Autism Spectrum Disorder
- Psychology Interventions for Pediatric Depression and Anxiety
- Brief Behavioral Intervention in Primary Care – Behavioral Modification Intervention for Primary Care Behavioral Health Clinicians
- Utilizing the RUBI Protocol to Address Disruptive Behaviors in Primary Care
- Motivational Interviewing for Behavioral Health Providers in Primary Care – Part 1 and 2
- Pediatric Sleep Disorders: Behavioral and Medication Management

In addition to the training modules, there is an integrated behavioral health tool kit available on the Texas Children's Health Plan's provider portal. The toolkit contains key primary care clinical resources including a comprehensive set of screening questionnaires, therapist handouts, medication treatment protocols, and therapy intervention protocols. Examples of templates include:

- CPT Code "Cheat Sheet" to help with coding and billing
- Psychiatric Discharge Note Template
- Behavioral Health Consultation and Screening Template
- Behavioral Health Diagnostic Interview Template
- Behavioral Health Progress Note Template
- Behavioral Health Letter Templates
- Charting tools--questionnaire templates
- Consent to treatment documents

APPENDIX D

Economic Analysis of the Core Components of the Expanded Model of Pediatric Care

We conducted an economic analysis of our model to understand short and long-term economic costs and benefits to the practice, health system, and society. The economic analysis is based on the core components listed in Table 1.

These estimates are based on two types of practices: practices that primarily serve patients with Medicaid (PMP) and practices that primarily serve patients with commercial insurance (PCIP). The economic analysis assumes that 75% of patients are covered by Medicaid and a pediatrician has a panel of 2027 patients at the PMP clinic and 72% of the patients have commercial insurance and a pediatrician has a panel size of 2822 patients at the PCIP clinic.

The costs of the core components is estimated to be approximately \$963,000 in the first year and \$821,000 in following years, assuming a pediatric practice of 3 providers.

The expected economic benefits accrue to multiple stakeholders, including the pediatric practice, the health plan insurer, school districts, criminal justice systems, child welfare, and social service agencies. The economic cost-benefit analyses demonstrated an expected mean net benefit, across all stakeholders, for year one between \$3.6 million and \$6.4 million for a PMP clinic and between \$5.1 million and \$8.6 million for a PCIP practice. In subsequent years, the expected mean net benefit, across all stakeholders, increases to between \$3.8 million and \$6.6 million for a PMP clinic and between \$5.2 million and \$8.7 million for a PCIP practice.

Estimates in expected revenues and cost savings are based on published rates; rates derived from large populations over long-range time periods. Thus, to realize the projected benefits requires implementing the proposed core components across a large population and providing these services over a significant period of time. Implementing the core components in a smaller number of clinics would allow for confirming the economic model assumptions; however, it is unlikely the full benefits shown in these analyses would be realized. Confirmation of projected economic outcomes would require full-scale implementation.

Our economic analysis demonstrates the potential for substantial societal savings. However, the large majority of the potential savings is realized outside of the pediatric practice, while the majority of the expenses are accrued by the pediatric practice. As a result, with the current payment systems, pediatric practices are unlikely to be able to cover the expenses of an expanded model on their own. In order to implement the proposed expanded model, it would likely require external investment or a different payment system.

The expected range of mean clinic revenues were determined assuming 3 pediatricians are employed at the clinic (Table 1D). The program costs were also budgeted assuming a clinic size of 3 pediatricians (Tables 7D - 10D). Non-clinic revenues and cost savings were determined using the average panel size for a single pediatrician at a PMP and PCIP clinic. The revenues and cost savings for the patients served by the PMP and PCIP clinic are summarized below with details provided in the following sections:

Clinic (PMP) (revenues): \$275,096 to \$423,725

Clinic (PCIP) (revenues): \$346,666 to \$556,259

Revenue benefit would be realized through billable clinic services performed by 3 pediatricians.

Hospital and/or health plan (PMP) (revenues): \$161,735 to \$407,549

Hospital and/or health plan (PCIP) (revenues): \$93,930 to \$261,049

Revenue benefit would be realized through per-member per-month revenue to the health plan insurer based on panel size of a single pediatrician.

Healthcare utilization (PMP) (cost savings): \$395,912 to \$735,743

Healthcare utilization (PCIP) (cost savings): \$516,003 to \$960,674

Cost savings from utilization would benefit the health plan insurer and/or a capitated provider based on panel size of a single pediatrician.

APPENDIX D

School district (PMP) (cost savings):	\$5,855 to \$6,351
School district (PMP) (revenues):	\$16,957 to \$84,788
School district (PCIP) (cost savings):	\$7,753 to \$8,416
School district (PCIP) (revenues):	\$23,620 to \$118,100

Cost savings benefit the school district through a reduction in needed services/ personnel; revenues would be generated from an increase in per-student attendance based on panel size of a single pediatrician.

Societal Benefits (PMP) (cost savings):	\$3,779,511 to \$5,734,439
Societal Benefits (PCIP) (cost saving):	\$5,034,601 to \$ 7,633,321

Cost savings benefit the local criminal justice system, child protective services, and the healthcare system based on panel size of a single pediatrician.

In addition to the expected mean annual economic benefits, long-term benefits to society are expected. These long-term economic benefits accrue to society over an individual's lifetime and include cost savings from a reduction in high school drop-outs, less exposure to second-hand smoke, and increased breastfeeding. The projected lifetime mean economic benefits range between \$12,063,085 to \$60,139,116 for patients served by the PMP clinic and between \$16,109,706 to \$80,553,669 for patients served by the PCIP clinic.

EXPECTED ANNUAL ECONOMIC BENEFIT ACROSS ALL CORE COMPONENTS

Table 1D: Revenues to Practice, Based on Panel Size of Three Pediatricians

	Primarily Medicaid Practice (PMP)	Primarily Commercial Insurance Practice (PCIP)
Clinic Revenues (3 Pediatricians)		
Clinic Volume Growth (5%)	\$42,713	\$83,756
Clinic Volume Growth (1%)	\$8,543	\$16,751
Increased MD capacity (1 patient/day)	\$37,800	\$44,800
Increased MD capacity (3 patients/day)	\$113,400	\$134,400
Increased volume for behavioral health	\$80,000	\$80,000
Increased volume for psychiatry	\$102,110	\$142,228
Revenues from flu vaccine (70% mothers)	\$29,642	\$41,268
Revenues from flu vaccine (70% of both (2) caretakers)	\$59,284	\$82,535
Revenues from Tdap vaccine (70% mothers)	\$9,217	\$11,721
Revenues from Tdap vaccine (70% of both (2) caretakers)	\$18,434	\$23,442
Revenues from 100% postpartum depression screening	\$7,784	\$9,898
Total Clinic Revenues (lower range)	\$275,096	\$346,666
Total Clinic Revenues (upper range)	\$423,725	\$556,259

Table 2D: Revenues to Hospital and/or Health Plan, Based on Average Panel Size for a Single Pediatrician

Non Clinic Revenues	Primarily Medicaid Practice (PMP)	Primarily Commercial Insurance Practice (PCIP)
Hospital Revenues		
Increase admission (5% clinic growth)	\$56,401	\$78,522
Increase admission (1% clinic growth)	\$11,280	\$15,704
Health Plan Revenues		
Improved patient retention in health plan (10%)	\$100,287	\$52,151
Increased Medicaid enrollment: per-member per-month (5% clinic growth)	\$250,841	\$130,376
Increased Medicaid enrollment: per-member per-month (1% clinic growth)	\$50,168	\$26,075
Total Hospital/ Health Plan Revenues (lower range)	\$161,735	\$93,930
Total Hospital/ Health Plan Revenues (upper range)	\$407,529	\$261,049

Table 3D: Cost Savings in Healthcare Utilization, Based on Average Panel Size for a Single Pediatrician

Healthcare Utilization Savings (1 Pediatrician)	Primarily Medicaid Practice (PMP)	Primarily Commercial Insurance Practice (PCIP)
Reduced emergency department visits (50%)	\$36,956	\$47,012
Reduced inpatient visits (50%)	\$21,306	\$27,094
Cost savings from flu vaccine (100% of eligible mothers)	\$636,066	\$833,901
Cost savings from flu vaccine (50% of eligible mothers)	\$318,033	\$416,950
Cost savings from Tdap vaccine (70% of eligible mothers)	\$19,617	\$24,947
Cost savings from Tdap vaccine (70% of 2 eligible caretakers)	\$41,415	\$52,667
Total Savings (lower range)	\$395,912	\$516,003
Total Savings (upper range)	\$735,743	\$960,674

Table 4D: Economic Benefits to School Districts

School Benefits (1 Pediatrician)	Primarily Medicaid Practice (PMP)	Primarily Commercial Insurance Practice (PCIP)
Reduction in speech delay	\$5,731	\$7,588
Reduction in absenteeism (10%)	\$16,957	\$23,620
Reduction in absenteeism (25%)	\$42,394	\$59,050
Reduction in absenteeism (50%)	\$84,788	\$118,100
Reduction in low English proficiency students (LEP) (10%)	\$124	\$165
Reduction in low English proficiency students (LEP) (25%)	\$310	\$414
Reduction in low English proficiency students (LEP) (50%)	\$620	\$828
Total Revenues (lower range)	\$22,812	\$31,373
Total Revenues (upper range)	\$91,139	\$126,516

Table 5D: Economic Benefits to Society

Societal Benefits: Annual	Primarily Medicaid Practice (PMP)	Primarily Commercial Insurance Practice (PCIP)
Reduction in incarceration	\$118,847	\$182,497
Reduction in maltreatment fatality	\$50,928	\$67,999
Reduction in maltreatment non-fatality	\$2,393,107	\$3,195,234
Reduction in foster care (over 1 year)	\$136,660	\$187,318
Reduction in teen pregnancy: 1 yr (10%)	\$2,424	\$4,332
Reduction in teen pregnancy: 1 yr (25%)	\$6,060	\$10,830
Reduction in teen pregnancy: 1 yr (50%)	\$12,120	\$21,660
Increased breastfeeding: 1 yr (80% of babies for 6 months solely)	\$591,236	\$751,873
Reduction in unintended pregnancy (10%)	\$182,739	\$232,388
Reduction in unintended pregnancy (25%)	\$456,847	\$580,971
Reduction in unintended pregnancy (50%)	\$913,694	\$1,161,942
Reduction in untreated postpartum depression: 1st year (10%)	\$31,706	\$40,320
Reduction in untreated postpartum depression: 1st year (25%)	\$79,264	\$100,799
Reduction in untreated postpartum depression: 1st year (50%)	\$158,527	\$201,598
Cost savings if at least 1 social determinant of health is met (10%)	\$271,864	\$372,640
Cost savings if at least 1 social determinant of health is met (25%)	\$679,660	\$931,600
Cost savings if at least 1 social determinant of health is met (50%)	\$1,359,320	\$1,863,200
Total Revenues (lower range)	\$3,779,511	\$5,034,601
Total Revenues (upper range)	\$5,734,439	\$7,633,321
Grand Total Program Economic Benefit (lower range):	\$4,635,066	\$6,022,573
Grand Total Program Economic Benefit (upper range):	\$7,392,575	\$9,537,819

Table 6D: Long-term Economic Benefits to Stakeholders

Long-Term-Economic-Benefits (1 Pediatrician)	Primarily Medicaid Practice (PMP)	Primarily Commercial Insurance Practice (PCIP)
Reduction in high school dropout: lifetime cost savings (10%)	\$3,712,995	\$4,957,524
Reduction in high school dropout: lifetime cost savings (25%)	\$9,282,487	\$12,393,810
Reduction in high school dropout: lifetime cost savings (50%)	\$18,564,975	\$24,787,620
Reduction in high school dropout: lifetime income loss (10%)	\$8,292,355	\$11,071,803
Reduction in high school dropout: lifetime income loss (25%)	\$20,730,888	\$27,679,509
Reduction in high school dropout: lifetime income loss (50%)	\$41,461,777	\$55,359,018
Increased breastfeeding: lifetime (80% of babies for 6 months solely)	\$695,572	\$884,557
Reduction in second-hand smoke exposure: lifetime (10%)	\$57,735	\$80,379
Reduction in second-hand smoke exposure: lifetime (25%)	\$146,182	\$203,515
Reduction in second-hand smoke exposure: lifetime (50%)	\$292,364	\$407,031
Total Revenues (lower range)	\$12,063,085	\$16,109,706
Total Revenues (upper range)	\$60,319,116	\$80,553,669

EXPECTED ANNUAL AND START-UP PROGRAM COSTS ACROSS ALL CORE COMPONENTS FOR A PRACTICE WITH 3 PEDIATRICIANS:

Table 7D: Personnel

Salaries / Personnel	FTE/Clinic	Annual Salary & Benefits	Rationale
Community liaison	1.0	\$68,750	Leads community engagement work and helps with community resources for SDH and home visitation
Social worker	3.0	\$225,000	1 social worker per pediatrician, responsible for majority of parenting, SDH, and family care components
Registered nurse home visitor	1.0	\$118,750	Responsible for home visitation component
Behavioral health provider	1.0	\$106,250	Responsible for behavioral health component
Receptionist	0.4	\$25,000	Included to support expected increased call and visit volume
Provider-community engagement time	0.1	\$22,500	Allows for pediatrician to participate in community activities
Community health coordinator	1.0	\$68,750	Assists with connecting families to services
Total	7.5	\$635,000	

Table 8D: Purchased Services

Outside Purchased Services	Unit cost	Total (Annual)	Total (1 time)
Community needs consultant	1-time fee		\$10,000
EMR upgrades	1-time fee		\$15,000
IT consultant	1-time fee		\$10,000
Funding for integrating community partners in practice		\$50,000	
Total		\$50,000	\$35,000

Table 9D: Capital Expenditures, Training and Other

Capital Expenditures	Unit Costs	# Units	Total (Annual)	Total (one time)
Computer/desk for new staff	\$3,000	8		\$24,000
Resource board in waiting room	\$500	1		\$500
Office equipment for community partners	\$3,000	2		\$6,000
Screening tablets	\$600	2	\$1,200	
Screening instruments	\$3,600	1	\$3,600	
TRAINING				
Behavioral health provider trainings	\$200	3	\$600	
Parenting and child development trainings	\$4,000	6	\$12,000	\$12,000
Lactation support training	\$600	4	\$2,400	
Core competencies training	\$5,000	1	\$5,000	
OTHER				
Food and events for community engagement	\$500	10	\$5,000	
Marketing and advertising	\$10,000		\$10,000	
Insurance, licensing, and credentialing	\$1,500	7	\$10,500	
EMR access	\$500	8	\$4,000	
Parenting resources for families	\$15	606	\$9,090	
Early brain development programs	\$50,000	1	\$50,000	
Total			\$113,390	\$42,500

Table 10D: Service Expenditures

Services	Unit cost	# Units	Total (Annual)	Total (one time)
Home Visitation Costs				
Telephone, per month	\$125	12	\$1,500	
Mileage, per month	\$250	12	\$3,000	
Materials for families	\$3	296	\$888	
Medical supplies for families	\$5	296	\$1,480	\$2,000
Family Connects training and support	\$60,000	1		\$60,000
Travel to training	\$2,000	1		\$2,000
Family Connects database access fee	\$480	1	\$480	
Vaccinations				
Tdap administration	\$44	186	\$8,162	
Influenza administration	\$16	426	\$6,812	
Vaccination educational materials	\$0.50	611	\$306	
Total			\$22,627	\$64,000
Grand Program Total			\$821,017	\$141,500

CORE COMPONENT SERVICES, OUTCOMES, COSTS, AND BENEFITS

COMMUNITY ENGAGEMENT CORE COMPONENT		
<i>Services include:</i> Needs assessment; partnering with community organizations		
Expected Outcome		Identify and deliver needed services that are highest priority Improve needs assessment precision Expand clinic understanding for non-clinical issues Increase volume Decrease no-show rate Clinic changes may drive neighborhood improvements Other outcomes derived from integrating community partners into clinic
Expected Program Cost	Start Up	\$17,350 Consulting on needs assessment EMR access and IT consulting
	Annual	\$103,250 Food for 10 community partner events Community liaison (1.0 FTE) Physician (0.10 FTE) Receptionist (0.08 FTE)
Expected Economic Benefit	Total	PMP: \$69,991 to \$349,955 revenue growth PCIP: \$58,530 to \$292,654 revenue growth
	Clinic Level	Increased billable volume due to awareness in community <ul style="list-style-type: none"> • 1% growth for PMP = \$8,543; PCIP = \$16,751 • 5% growth for PMP = \$42,713; PCIP = \$83,756
	Healthcare System Level	Increased admissions due to increased clinic volume <ul style="list-style-type: none"> • 1% growth for PMP = \$11,280; PCIP = \$15,704 • 5% growth for PMP = \$56,401; PCIP = \$78,522 Increased annual per member per month revenues from <ul style="list-style-type: none"> • 1% Medicaid growth at PMP: \$50,168; PCIP: \$26,075 • 5% Medicaid growth at PMP: \$250,841; PCIP: \$130,376
Expected Non-economic Benefit	Clinic Level	More precise understanding of community needs resulting in targeted delivery of health and non-health services to community
	Healthcare System Level	Community needs assessment requirement met
	Child/family Level	Improved access to needed services resulting in improved health
	Community Level	Improved access to needed services resulting in improved health

PARENTING AND CHILD DEVELOPMENT

Services include: Home visitation for parents of newborns (Family Connects), extended well-child checks at key developmental stages, parenting helpline, parenting consultations, early brain development programs

<p>Expected Outcome</p>		<p>Reduced emergency medical care for infants Improvement in third grade reading levels Decreased high school dropouts Decreased absenteeism Reduction in juvenile delinquency Improvements in employment and less reliance on social services Reduction in maltreatment and involvement with CPS Increased efficiency of pediatrician Increased parent satisfaction leading to improved retention of families and increase in referrals Early identification of developmental needs.</p>
<p>Expected Program Cost</p>	<p>Start Up</p>	<p>\$101,725 EMR access, IT consulting and staff training</p>
	<p>Annual</p>	<p>\$435,188 Registered nurse (1.0 FTE) Social worker (3 FTEs) Receptionist (0.08 FTE) Training for staff Early brain development programs Mileage Materials for families</p>
<p>Expected Economic Benefit</p>	<p>Total</p>	<p>PMP: \$2,918,824 to \$3,835,598 total economic benefit PCIP: \$3,835,646 to \$4,020,389 total economic benefit</p>
	<p>Clinic Level</p>	<p>Increased revenue due to 3 MD increased capacity</p> <ul style="list-style-type: none"> • 1 patient/ day PMP: \$37,800; 3 patients/ day: \$113,400 • 1 patient/ day PCIP: \$44,800; 3 patients/ day: \$134,400
	<p>Healthcare System Level</p>	<p>Reduces emergency department visits (expenses) by 50%</p> <ul style="list-style-type: none"> • 37 fewer visits in PMP: \$36,956 • 47 fewer visits in PCIP: \$47,012 <p>Reduces inpatient visits (expenses) by 50%</p> <ul style="list-style-type: none"> • 1.59 fewer visits in PMP: \$21,306 • 2.02 fewer visits in PCIP:\$27,094 <p>Increases patient satisfaction via CAHPS</p> <ul style="list-style-type: none"> • Potential higher bonuses in pay-for-performance Medicaid plans • Improvements in retention rates by 10% increase PMPM revenues • At PMP: \$100,287; at PCIP: \$52,150 <p>Reduction in total costs of speech delay for ages 1-5*</p>

PARENTING AND CHILD DEVELOPMENT

Services include: Home visitation for parents of newborns (Family Connects), extended well-child checks at key developmental stages, parenting helpline, parenting consultations, early brain development programs

	<p>Community Level</p>	<p>Cost savings from incarceration, annual short term</p> <ul style="list-style-type: none"> • At PMP: \$118,847, at PCIP: \$182,497 <p>Cost savings from maltreatment (reduction in fatality)</p> <ul style="list-style-type: none"> • At PMP: \$50,928; at PCIP: \$67,999 <p>Cost savings from maltreatment (non-fatality)</p> <ul style="list-style-type: none"> • At PMP: \$2,393,107; at TCP: \$3,195,234 <p>Cost savings from reduction in foster care utilization over 2 years</p> <ul style="list-style-type: none"> • At PMP: \$273,320; at PCIP: \$374,636 <p>School district revenue increase due to reduction in absenteeism</p> <ul style="list-style-type: none"> • 10% reduction savings at PMP: \$16,957, at PCIP: \$23,620 • 25% reduction savings at PMP: \$42,394, at PCIP: \$59,050 • 50% reduction savings at PMP: \$84,788, at PCIP: \$118,100 <p>Reduction in school district cost due to reduction in low English proficiency students (improved reading)</p> <ul style="list-style-type: none"> • 10% improvement savings at PMP: \$124, at PCIP: \$165 • 25% improvement savings at PMP: \$310, at PCIP: \$414 • 50% improvement savings at PMP: \$620, at PCIP: \$828
<p>Expected Long-Term Economic Benefit</p>	<p>Total</p>	<p>PMP: \$12,005,350 to \$60,026,752 PCIP: \$16,029,327 to \$80,146,638</p>
	<p>Community Level</p>	<p>Lifetime cost savings from reduction in high school dropout rate</p> <ul style="list-style-type: none"> • 10% reduction savings at PMP: \$3,712,995, at PCIP: \$4,957,524 • 25% reduction savings at PMP: \$9,282,487, at PCIP: \$12,393,810 • 50% reduction savings at PMP: \$18,564,975, at PCIP: \$24,787,620 <p>Lifetime income loss due to reduction in high school rate</p> <ul style="list-style-type: none"> • 10% reduction savings at PMP: \$8,292,355, at PCIP: \$11,071,803 • 25% reduction savings at PMP: \$20,730,888, at PCIP: \$27,679,509 • 50% reduction savings at PMP: \$41,461,777, at PCIP: \$55,359,018
<p>Expected Non-Economic Benefit</p>	<p>Child/Family Level</p>	<ul style="list-style-type: none"> • Improved parent and child relational health • Increased child social-emotional development • Higher quality home and learning environments • Early identification of needs and connection to resources/services
	<p>Community Level</p>	<ul style="list-style-type: none"> • Reductions in school and community violence • Increased school readiness

**Note these costs are underestimated because the analyses used a \$6 per member per month rate and not costs for actual utilization.*

BEHAVIORAL HEALTH:

Services include: Universal screening for behavioral health; integrated behavioral health with a licensed behavioral health provider, referral network, and care coordination

Expected Outcome		<p>Increased identification of potential behavioral health needs and referral to services</p> <p>Reduced emergency department visits</p> <p>Less absenteeism</p> <p>Increased test scores</p> <p>Improved graduation rates</p> <p>Reduced teen pregnancy</p>
Expected Program Cost	Start Up	<p>\$10,350</p> <p>EMR access, IT consulting</p>
	Annual	<p>\$115,150</p> <p>Behavioral health provider (1.0 FTE)</p> <p>Receptionist (0.08FTE)</p> <p>Materials for families</p> <p>Behavioral health screeners</p> <p>Screening tablets</p> <p>Training for behavioral health to integrate into primary care</p>
Expected Economic Benefit	Total	<p>PMP: \$187,079 to \$206,471 total economic benefit</p> <p>PCIP: \$231,061 to \$265,717 total economic benefit</p>
	Clinic Level	<p>Identify/ refer services to licensed behavioral health provider</p> <ul style="list-style-type: none"> Revenues from 20 hours of health and behavior intervention codes and 10 hours of psychotherapy generates ~ \$80,000
	Healthcare System Level	<p>Reduction in emergency department visits</p> <ul style="list-style-type: none"> Cost savings at PMP: \$121; at PCIP = \$169 <p>Increased volume to Psychiatry</p> <ul style="list-style-type: none"> Revenues from PMP: \$102,110; from PCIP \$142,228 <p>Improvement in Medicaid pay for quality performance</p> <ul style="list-style-type: none"> Potential bonus payment to the health plan
Expected Long-Term Economic Benefit	Community Level	<p>Reduced suicide rates</p> <p>Reduced child protective services involvement</p> <p>Reduced legal system costs</p>

BEHAVIORAL HEALTH:

Services include: Universal screening for behavioral health; integrated behavioral health with a licensed behavioral health provider, referral network, and care coordination

Expected Non-economic Benefit	Clinic Level	Increased access to behavioral health in community Reduced wait time for psychiatry due to milder cases managed in primary care
	Healthcare System Level	Increased volume due to increased services and improved access Increased training opportunities (internships) for behavioral health professionals in primary care
	Child/family Level	Better school performance
	Community Level	Rapid intervention in acute mental health issues Increased training opportunities (internships) for behavioral health professionals in primary care Increased school readiness Better grades/test scores Behavioral health on parity with physical health via equal access to care and treatment Reduction in stigma surrounding behavioral health conditions

FAMILY MEDICAL CARE:

Services include: Family planning, lactation services, smoking cessation services and parental depression (identification, brief counseling, refer out), and targeted immunization services for family/parents on site.

Expected Outcome		Decreased unintended pregnancies Improved school readiness Improved health status for infant and mother due to breastfeeding leading to a reduction in healthcare costs and emergency department visits Decreased smoking leading to improvements in child health Increased Tdap vaccinations to prevent pertussis Increased flu vaccination to reduce flu incidence
		Increased volume due to increased services and improved access Increased training opportunities (internships) for behavioral health professionals in primary care

FAMILY MEDICAL CARE:

Services include: Family planning, lactation services, smoking cessation services and parental depression (identification, brief counseling, refer out), and targeted immunization services for family/parents on site.

Expected Program Cost	Start Up	<p>\$23,225</p> <p>EMR access</p> <p>IT consulting</p> <p>One Key Question program (\$22,000)</p> <p>Competency training (\$5,000)</p>
	Annual	<p>\$33,158</p> <p>Receptionist (0.08FTE)</p> <p>Training, including competency training, for staff</p> <p>One Key Question ongoing</p> <p>Tdap vaccine expense</p> <p>Flu vaccine expense</p> <p>Existing social worker (see parenting and child core component)</p>
Expected Economic Benefit	Total	<p>PMP: \$1,159,987 to \$2,371,473 total economic benefit</p> <p>PCIP: \$1,488,936 to \$3,043,364 total economic benefit</p>
	Clinic Level	<p>Revenues generated from flu vaccine*</p> <ul style="list-style-type: none"> 70% of eligible mothers receive vaccine: PMP: \$29,642, PCIP: \$41,268 70% of both (2) caretakers receive vaccine: PMP: \$59,284 PCIP: \$82,535 <p>Revenues generated from Tdap vaccine*</p> <ul style="list-style-type: none"> 70% of eligible mothers receive vaccine: PMP: \$9,217, PCIP: \$11,721 70% of both (2) caretakers receive vaccine PMP: \$18,434, PCIP: \$23,442 <p>Revenues generated from 100% postpartum depression screening for mothers with infants</p> <ul style="list-style-type: none"> At PMP: \$7,784, at PCIP: \$9,898
	Healthcare System Level	<p>Cost savings if 80% of babies are breast fed solely for 6 months (current rate = 12%, incremental savings based on moving from 12% to 80%) PMP: \$591,236, PCIP: \$751,873</p> <p>Cost savings from flu vaccine if mothers who are not usually vaccinated get vaccinated and their children do not get flu</p> <ul style="list-style-type: none"> 100% of eligible mothers PMP: \$636,066, PCIP: \$833,901 50% of eligible mothers PMP: \$318,033, TCP: \$416,950 <p>Cost saving if eligible moms (50% of total moms**) receive Tdap vaccine (current rate of pertussis is 0.12%)</p> <ul style="list-style-type: none"> 70% of eligible moms PMP: \$19,617, PCIP: \$24,947 70% of eligible moms and second caretaker PMP: \$41,415, PCIP: \$52,667

FAMILY MEDICAL CARE:

Services include: Family planning, lactation services, smoking cessation services and parental depression (identification, brief counseling, refer out), and targeted immunization services for family/parents on site.

	<p>Community Level</p>	<p>Cost savings for unintended pregnancy (rate is 54%) for year 1 post birth for prenatal care, reduction in labor and delivery, postpartum care and the first 12 months of infant care</p> <ul style="list-style-type: none"> • 10% reduction in unintended pregnancy: PMP: \$182,739, PCIP: \$232,38 • 25% reduction in unintended pregnancy: PMP: \$456,847, PCIP: \$580,971 • 50% reduction in unintended pregnancy: PMP: \$913,694, PCIP: \$1,161,942 <p>Cost savings due to improvements in reading readiness</p> <ul style="list-style-type: none"> • see above sections <p>Treatment for postpartum depression 5 year cost savings (50% of costs occur in 1st year)</p> <ul style="list-style-type: none"> • 10% of untreated postpartum depression cases get treatment: PMP: \$63,411; PCIP: \$80,639 • 25% of untreated postpartum depression cases get treatment :PMP: \$158,527; PCIP: \$201,598 • 50% of untreated postpartum depression cases get treatment: PMP: \$317,054; PCIP: \$403,196 <p>Cost savings associated with decrease absenteeism and/or juvenile detention – see above sections</p>
<p>Expected Long-Term economic Benefit</p>		<p>Cost savings for reduced direct medical and indirect costs and the cost of premature death</p> <ul style="list-style-type: none"> • 80% of all infants were breastfed solely for 6 months: PMP: \$695,572; PCIP: \$884,557 <p>Cost saving for reduction in exposure to second hand smoke***</p> <ul style="list-style-type: none"> • 10% reduction in exposure PMP: \$57,735, PCIP: \$80,379 • 25% reducing in exposure PMP: \$146,182, PCIP: \$203,515 • 50% reducing in exposure PMP: \$292,364, PCIP: \$407,031

**Assumes mothers/ caretakers have insurance that will pay for vaccines at a rate comparable to that of Medicaid.*

***Literature states that 69% of patients will receive the vaccine if offered by a pediatrician and 50% get the vaccine antepartum.*

****Literature suggests that approximately 9.1% of kids 0-20 are exposed to detectable levels of second-hand smoke.*

SOCIAL DETERMINANTS OF HEALTH (SDH):

Services include: Identification of social needs and resource for all families, community health coordinator to help families seamlessly connect with services, embedding community organizations into pediatric practice to address the needs of the patients and their families (e.g., medical-legal partnership).

Expected Outcome		<p>Improved child health by connecting families to services leads to a reduction in emergency room utilization and hospitalization</p> <p>Reduction in incarceration for juveniles</p> <p>Reduction of school drop-out rates</p> <p>Reduction of absenteeism</p> <p>Increased WIC enrollment improves nutrition leading to improvements in school performance</p> <p>Decreased diabetes and improved BMI</p> <p>Improvements for the family include financial / job training leading to better outcomes for housing, food access, home stability, and school access</p> <p>Additional benefits at the community level include improved neighborhood-level crime rates, property value, and overall economic development</p> <p>Clinic-level outcomes include improved clinic reputation and volume</p>
Expected Program Cost	Start Up	<p>\$13,850</p> <p>EMR access and IT consulting</p> <p>Resource board</p>
	Annual	<p>\$125,750</p> <p>Community Health Coordinator (1.0FTE)</p> <p>Receptionist (0.08FTE)</p> <p>Existing social worker (see parenting and child core component)</p> <p>Integration of community partners into clinics</p>
Expected Economic Benefit	Total	<p>PMP: \$271,864 to \$1,359,320 total economic benefit</p> <p>PCIP: \$372,640 to \$1,863,200 total economic benefit</p>
	Clinic Level	<p>Improvement in family and child health and school readiness</p> <p>- see economic benefits in above sections</p>
	Community Level	<p>Cost savings if at least 1 social determinant of health is met</p> <ul style="list-style-type: none"> - 10% of children in need: PMP: \$271,864, PCIP: \$372,640 - 25% of children in need: PMP: \$679,660, PCIP: \$931,600 - 50% of children in need: PMP: \$1,359,320, PCIP: \$1,863,200 <p>Additional community benefits are listed in above sections</p>
Expected Non-economic Benefit	Community Level	<p>Improved neighborhoods, decreased crime, increased property, value, increased economic development</p>

COST MODEL ASSUMPTIONS

General Assumptions

The economic cost-benefit analysis was performed for 2 different types of practices. Clinic revenues and program costs were computed using the cumulative mean panel size for 3 pediatricians. Non-clinic revenues and stakeholder cost savings were computed using the mean panel size for 1 pediatrician. The first practice type was a primarily Medicaid practice (PMP), and the analysis assumes a pediatrician panel size of 2027 patients with 774 children ages 0 - 3. The payer mix for PMP was assumed to be 75% Medicaid. Annually, PMP has 8569 well-child visits, across 3 pediatricians and 1 nurse practitioner at a mean reimbursement rate of \$85; 8569 sick-child visits at a mean reimbursement rate of \$50; and 383 other visits at a mean reimbursement rate of \$25. The second practice type was a primarily commercial insurance practice (PCIP) and the analysis assumes a pediatrician panel size of 2822 patients with 1024 children ages 0 - 3. The payer mix for PCIP was assumed to be 72% commercial insurance. Annually, PCIP has 8307 well-child visits across 3 pediatricians, 1 nurse practitioner and 1 physician assistant, at a mean reimbursement rate of \$100; 14,210 sick-child visits at a mean reimbursement rate of \$60; and 2744 other visits at a mean reimbursement rate of \$30. It was assumed that PMP operates at 81% capacity with a 12% no-show rate while PCIP operates at 83% capacity with a 5.7% no show rate, allowing for up to 5% growth at both practice types. The Medicaid per-member per-month payment was estimated at \$275. The economic cost-benefit analyses assumed a pediatrician works 200 days per year. All other assumptions were based on literature and/or published rates. These assumptions are detailed below.

ECONOMIC BENEFIT MODEL ASSUMPTIONS/ REFERENCES

Revenue Assumptions

Changes to the pediatric practice are assumed to optimize the pediatricians time allowing him or her to see between 1 to 3 additional patients per day.

The reimbursement rate for well-child visits, sick visits, and miscellaneous at a PMP is \$85, \$50, and \$25, respectively. The reimbursement rate for well-child visits, sick visits, and miscellaneous at a PCIP is \$100, \$60, and \$30, respectively.

The Medicaid revenues that are attributed to increased beneficiary enrollment are estimated at \$275 per member per month.

The emergency department reimbursement rate used in the model was \$1,000, a blended rate between a low acuity rate of \$900 and a high acuity rate of \$2800 (source: https://consumerhealthratings.com/healthcare_category/emergency-room-typical-average-cost-of-hospital-ed-visit/). The mean number of emergency visits assumed was 389/ 1000 (source: <https://www.hcup-us.ahrq.gov/reports/statbriefs/sb242-Pediatric-ED-Visits-2015.pdf>).

The inpatient reimbursement rate used in the model was \$13,400, a rate for non-birth hospital stays (source: <https://www.hcup-us.ahrq.gov/reports/statbriefs/sb250-Pediatric-Stays-Costs-2016.pdf>). The mean number of hospital admissions assumed was 15.5/ 1000 (source: <https://www.hcup-us.ahrq.gov/reports/statbriefs/sb242-Pediatric-ED-Visits-2015.pdf>).

Behavioral Health

The economic model assumes a licensed behavioral health provider bills 20 hours of HBAI codes and 10 hours of psychotherapy codes with expected revenues of \$80,000. It was also assumed that 12% of all patients will both screen positive and receive behavioral health and the addition of behavioral health reduces emergency visits by 0.5/1000. Twenty-five percent of behavior health services were assumed to be delivered by a psychiatrist, who provides 6 sessions at a reimbursement level of \$100 per session.

Reading Improvement

The Houston Independent School District (HISD) reported 3 reading specialists support 115,000 children in grades K-5. Reading specialists earn \$55,000 per year. In addition, HISD spends \$280,000 annually on the Lower English Proficiency (LEP) program, which serves the entire student population of 209,000. HISD has 31% of students categorized as LEP.

In HISD, 33% of students fail the third grade STAAR reading proficiency test (source: <https://www.texasmonthly.com/news/texas-kids-failing-staar-tests-rigged/>). Students that fail this test are 4 times more likely to drop out of high school (source: https://www.houstonisd.org/site/handlers/filedownload.ashx?moduleinstanceid=48525&dataid=244567&FileName=2018-19_FactsFigures_.pdf; <https://www.aecf.org/blog/poverty-puts-struggling-readers-in-double-jeopardy-minorities-most-at-risk/>).

Students who drop out of high school make \$10,000/ year less than a high school graduate and a total of \$670,000 less over their lifetime (source: https://www.huffpost.com/entry/high-school-dropout-rate_b_5421778; Levine and Bellfield, 2007.). The cost to society for each high school dropout, including healthcare, criminal activity and reliance on welfare, is \$250,000 - \$290,000 over a lifetime. Note that these data are from 2011, so the economic model used an adjusted rate of \$300,000 (source: http://blogs.edweek.org/edweek/education_futures/2013/11/high_school_dropout_rate_causes_and_costs.html).

Absenteeism

HISD has a 9.3% rate of students with chronic absenteeism, defined as missing more than 18 days per year (source: <https://www.houstonchronicle.com/news/houston-texas/houston/article/HISD-seeks-to-combat-chronic-absenteeism-8002560.php>). Chronic absenteeism costs HISD approximately \$50 per day per child (source: www.attendanceworks.org; www.edweek.org/ew/articles/2017/10/25/we-can-fix-chronic-absenteeism.html).

Juvenile Delinquency

In Texas, the rate of juvenile delinquency is 152/100,000. The minimum length of stay is between 9 and 24 months and is based on the severity of the youth's offense and the risk he or she poses to the public (source: <https://thinkprogress.org/high-costs-could-lead-texas-to-end-its-juvenile-prison-system-updated-5ecd5aa6b105/>).

Child Maltreatment

The rate of child mistreatment is 7.9 per 1000 in Texas (source: https://www.dfps.state.tx.us/About_DFPS/Reports_and_Presentations/PEI/documents/2019/2019-03-01_FY2018_Child_Fatality_and_Near_Fatality_Annual_Report.pdf). The estimated cost of child maltreatment is \$210,000 over the child's lifetime. The estimated average lifetime cost per victim of fatal child maltreatment is \$1.27 million (source: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3776454/>).

Teenage Pregnancy

In Harris County, there are 30 teenage pregnancies per 1000 children aged 15-19 (source: <https://www.hhs.gov/ash/oah/facts-and-stats/national-and-state-data-sheets/adolescent-reproductive-health/texas/index.html>). The average cost nationally to provide medical and economic support during pregnancy and the first year of infancy is \$16,000 per teen birth (source: <http://www.ncsl.org/research/health/teen-pregnancy-prevention.aspx>).

Child Protective Services

The cost for child protective services in Texas is \$27.07 for basic care per child per day, \$47.37 for moderate care, \$57.86 for specialized care, and \$92.43 for intense care (source: https://www.dfps.state.tx.us/Doing_Business/Purchased_Client_Services/Residential_Child_Care_Contracts/Rates/default.asp). During 2018, there were 29,927 children in foster care in Texas and 7.25 million children in Texas, indicating a rate of 0.0041 (source: <https://www.adoptuskids.org/adoption-and-foster-care/how-to-adopt-and-foster/state-information/texas>). The average time spent in foster care is 2 years (source: <https://www.childrensrights.org/newsroom/fact-sheets/foster-care/>). The economic model assumed a moderate level of care and average time in care of 2 years.

Speech Development

The average per-member per-month cost for speech delay was estimated to be \$6.00. The prevalence of speech sound disorders (namely, articulation disorders or phonological disorders) in young children is 8% to 9%. By the first grade, roughly 5% of children have noticeable speech disorders, including stuttering, speech sound disorders, and dysarthria; the majority of these speech disorders have no known cause (sources: <https://www.nidcd.nih.gov/health/statistics/quick-statistics-voice-speech-language>; <https://www.ncbi.nlm.nih.gov/PMP/articles/PMP2755217/>). The economic model used a rate of 5% for children ages 1-5 and assumed costs were incurred for 2 years. This value is likely underestimated because the per-member per-month cost was attributed only to those expected to have speech delay.

Lactation

Government survey data suggest that only 12 percent of mothers are exclusively breastfeeding at six months. A 2010 publication in Pediatrics concluded that if 80% of mothers breastfed exclusively for six months, the US would save \$10.5 billion per year and prevent 741 deaths. In 2010 there were 4M live births suggesting that if 3.2M mothers breastfed exclusively for six months \$10.5B would be saved. This equates to projected annual cost savings of \$3,281 per breastfed child, assuming the compliance rate of 80% is obtained (sources: <https://www.reuters.com/article/us-breastfeeding-study/more-breastfeeding-could-save-u-s-billions-study-idUSTRE6342ZG20100405>; <https://www.ncbi.nlm.nih.gov/pubmed/20368314>; <https://www.ncbi.nlm.nih.gov/books/NBK52687/>.)

Second-hand Smoke

Using blood nicotine detection levels of >0.05ng/ml, the CDC found there are approximately 40% of children ages 3-11 and 33% of children ages 12-19 that are exposed to second-hand smoke (SHS) (source: CDC Report - Vital Signs: Disparities in Nonsmokers' Exposure to Secondhand Smoke — United States, 1999-2012). A WHO study, using a detection level of 0.05ng/ml, found the health-care, productivity, and nonmedical direct costs for children exposed to SHS in U.S. public housing totaled \$96 million; there were 23,000 children in the WHO study suggesting the annual costs for children exposed to SHS is \$4173 annually. The data were from 1991-2012 (source: <https://www.hud.gov/sites/documents/GUIDANCEWORK.PDF>).

Vaccinations

The rate of pertussis in infants <12 months of age was 117.7/100,000 in a commercially insured population. The incremental cost of pertussis during the 12-month follow-up period averaged \$8271 (source: <https://www.ncbi.nlm.nih.gov/PMP/articles/PMP5312729/>). A postpartum vaccination strategy for Tdap with a delay to protection of 7 days would reduce pertussis incidence for newborns by 9% if only mothers were vaccinated or by 19% if 2 caregivers were vaccinated (source: <https://www.ncbi.nlm.nih.gov/PMP/articles/PMP4908210/>). Research shows 69% of infant caregivers accepted and received the Tdap vaccine when it was offered by their pediatricians (source: <https://www.rwjf.org/en/blog/2012/03/lets-make-it-easier-for-caregivers-to-protect-infants-from-whooping-cough.html>); given 50% of mothers received Tdap antepartum, the economic model assumes 35% of mothers will get the vaccination in the pediatrician's office (70% of 50% eligible).

For flu vaccination it was assumed that a mother had an average of 1.9 children, based on the US average. This was used to determine the number of mothers of children aged 0-5 in the practice. Estimated incidence of symptomatic influenza in children <18 is ~9% (source: <https://www.ncbi.nlm.nih.gov/PMP/articles/PMP5934309/>). Medical expenses due to the flu ranged from \$300 to \$4000, and parent(s) missed between 11 and 73 hours of work, costing \$855 in lost revenue (source: <https://www.cdc.gov/flu/spotlights/2011-2012/childrens-flu-costly.htm>). The economic analyses used an average medical expense rate due to the flu of \$2150. In Harris County 43% of residents receive the flu vaccine. The economic model assumes 70% of those eligible to be vaccinated will receive the vaccine in the pediatrician's office; this is approximately the same rate that was used for Tdap. In addition, between 5% and 20% of individuals get the flu; the analyses used 12.5% as the expected rate (source: https://www.hhs.gov/sites/default/files/seasonal_flu_gd.pdf).

Revenues generated from the flu vaccine used the reimbursement rate of \$24.87 and a cost of \$16.00. However, revenues generated from the flu vaccine may be overestimates, especially at the PMP clinic, as we would expect many of these families not to have health insurance.

Pregnancy

The economic analyses assumed that the number of pregnancies for the PCIP and PMP practices were equal to the number of children <1. In Texas, 54% of all pregnancies (298,000) were unintended (source: https://www.guttmacher.org/sites/default/files/factsheet/tx_18.pdf). On average, a publicly funded birth cost \$12,770 in prenatal care, labor and delivery, postpartum care, and the first 12 months of infant care (source: <https://www.washingtonpost.com/news/wonk/wp/2015/03/03/unplanned-pregnancies-cost-taxpayers-21-billion-each-year/>).

Postpartum Depression

The economic analyses assumed the number of pregnancies for the PCIP and PMP practices were equal to the number of children younger than one year. Perinatal mood and anxiety disorders, including prenatal and postpartum depression, affects at least 1 in 7 women and approximately 50% go untreated (source: <https://www.mathematica.org/news/new-study-uncovers-the-heavy-financial-toll-of-untreated-maternal-mental-health-conditions>). Following the mother-child pair from pregnancy through 5 years postpartum, the estimated cost in 2017 was an average of \$32,000 for every mother-child pair affected but not treated (source: <https://www.chcf.org/project/quantifying-cost-perinatal-mood-anxiety-disorders-us/>). A 2019 study found \$35,000 in increased health care costs, lost income, reduced economic output, and increased use of public services for each mother and child pair; about half of these costs occur within the first year and are associated with pregnancy and birth complications (source: <https://www.calhealthreport.org/2019/05/08/untreated-postpartum-depression-and-anxiety-costs-california-billions-report-concludes/>).

Social Determinants of Health

Sixty-eight percent of patients face at least one barrier related to social determinants (source: <https://info.waystar.com/rs/578-UTL-676/images/Clinical-Consumer-Survey-2018-WP.PDF>). The group reporting that all their social needs were met experienced an 11% reduction, or \$2601, in total healthcare costs in the year after social service referrals. Patients who had just one of their social needs met experienced a 7% reduction in total care costs compared to those who had none of their needs met (source: <https://healthitanalytics.com/news/costs-fell-by-11-when-payer-addressed-social-determinants-of-health>). The economic model assumes if 11% is \$2601, then 7% would be \$1655. Another study showed that within 6 months, Advocate Health Care reduced healthcare costs by \$3800 per patient due to meeting food insecurity (source: <https://revcycleintelligence.com/news/how-addressing-social-determinants-of-health-cuts-healthcare-costs>). Last, a third study reported \$2400 in annual savings per person – for people who were successfully connected to social services compared to a control group of members who were not (source: <https://hscweb3.hsc.usf.edu/health/publichealth/news/dr-zachary-pruitt-examines-how-access-to-social-services-reduces-healthcare-costs/>). For the economic model an expected cost savings of \$2000 was assumed for connecting patients to services.

APPENDIX E

Evaluation of the Model

Utilizing the targeted universalism framework, the overall goal of the reconsideration of the pediatric office is to improve the health, well-being, and development of children and families through early brain development, healthy children, stable families, and thriving communities. To achieve this goal, the model includes universal expanded services, such as home visiting for newborns and universal screening of children and families to identify needs. Based on needs identified during the home visit or through screening, individualized or targeted services or resources can be provided with the goal of ensuring all children and families are given the support needed. This tailored approach, however, means children and families may receive different services, but the universal goal is the same for all. To measure the impact of this new service delivery model, particular attention needs to be paid to a precise data collection plan. Additionally, it will be important to measure outcomes overall and by key subgroups of the population, such as racial and ethnic groups or developmental stages, to ensure an accurate assessment of the full effect of the strategy.

This is a framework to help guide the evaluation design of the model. The specific questions guiding the evaluation may vary by practice. The “model” refers to the expanded services added by the individual practice, in this case the core components as outlined in Table 1. The description of how each question will be evaluated corresponds to the columns in the logic models (Tables 1E – 3E). For purposes of this evaluation framework, three questions are used to guide the evaluation:

1. Does the model increase identification of and access to a wider scope of services to improve health, well-being, and development of children and families?
2. Does the model improve health outcomes and well-being for children, families, and communities, including clinical health and social outcomes, and satisfaction with care?
3. Is the model financially sustainable?

EVALUATION QUESTIONS AND LOGIC MODELS

Logic models graphically display the theory of change for a program or policy. These logic models are arranged by our key evaluation questions rather than by domain because there is overlap in potential measures and outcomes among domains. The framing questions below are not intended to be prescriptive, but a guide for what might be measured depending on the components implemented. The specific measures and measure specifications will need to be determined by each practice, consulting with stakeholders such as providers, practice staff, patients, and community partners and members, as data availability will likely vary depending on the practice and its electronic medical record. Appendix F includes a template that guides practices on the aspects that should be considered for each measure of the evaluation.

In the logic models (Tables 1E – 3E), process measures can be thought of as counts (i.e., How many children or parents receive a particular service?). Short-term and intermediate outcomes are expected to be achieved in the first 5 years of model implementation and long-term outcomes are anticipated after 5 years of implementation. Of note, some outcomes listed in the logic models are not measurable using practice-level data. For example, emergency department visits and inpatient stays will likely need to be measured among a subgroup for whom data are available, such as members of a single health plan willing to share claims data. Other important outcomes, such as third-grade reading level, kindergarten readiness, or child maltreatment, require data-sharing agreements from other sectors (i.e., school systems and child welfare) or proxy measures. These challenges should all be considered as the practice identifies and engages with community partners.


Question 1: Does the model increase identification of and access to a wider scope of services to improve the health, well-being, and development of children and families?

A critical cornerstone of the model is to increase the connection to and capacity of resources within communities intended to improve wellbeing. We will evaluate aspects of community engagement to address

SDH/community needs (i.e., the process measures of identification and prioritization of community assets and needs to determine the expanded services needed, identification of community partners to deliver them, including any partners embedded into the practice upon implementation of the model). In table 1E, short-term outcomes related to community engagement include access to social services through newly established or strengthened partnerships with community partners in the first 5 years of implementation. Long-term, the key measures determine how comprehensive the system of care is for children and families in the community (i.e., Is the system responsive? Are there any gaps?).

For additional domains (parenting and child development, behavioral health, family medical care, and SDH) process measures in the logic model (table 1E) determine the extent to which universal screenings are implemented and referral to services as a result of a positive screen. Short-term outcomes measure the utilization of services when referred, based on a positive screen. Long-term outcomes focus on improvements to the system of care in the community and within the clinic resulting from the provision of non-traditional services in a clinic setting.

TABLE 1E. LOGIC MODEL FOR EVALUATION QUESTION 1

Does the model increase identification of and access to a wider scope of services to improve the health, well-being, and development of children and families?			
Target Population	Process Measures	Short-term and Intermediate Outcomes (<5 years)	Long-term Outcomes (≥5 years)
<ul style="list-style-type: none"> • Children • Parents/ caregivers • Community 	<ul style="list-style-type: none"> • Identify and prioritize community assets and needs • Number of community partners identified (focusing on organizations to meet needs identified) • Community partners embedded in practice (could be short term outcome, if not established at implementation) • Host and attend community events 	<ul style="list-style-type: none"> • Increased access to social services through partnerships/linkages with community partners • Improved follow-up with referrals for social needs • Improved referral network between practice and community organizations • Improved cultural appropriateness of services, specific to the local community 	<ul style="list-style-type: none"> • Improved system of care for children and families in community • Increased funding for expanded services, such as parenting consultation and home visitation • Reduced stigma in seeking help for parenting, behavioral health, and social needs • Reduced long-term effects/ issues due to early intervention <ul style="list-style-type: none"> » Improved school performance » Improved reading skill » Improved high school graduation rate » Reduced absenteeism (school, work)
	<ul style="list-style-type: none"> • Universal screening for parenting and child development, behavioral health, family medical care, and SDH <div style="text-align: center;">  </div> <ul style="list-style-type: none"> • Referral to targeted services or specialty care: parenting consultation, behavioral health, smoking cessation, well-woman care, social needs, etc. 	<ul style="list-style-type: none"> • Increased utilization of targeted services: parenting consultation, behavioral health (child and parent), smoking cessation, well-woman care, social needs • Increased use of community resources to meet social needs • Improved referral system for social needs (improved follow-up and “closing the loop”) • Increased referral to specialty care (i.e., psychology for more complex behavioral health needs) • Reduced wait time for specialty care as preventative services are offered and mild cases are managed in primary care • Increased early intervention due to needs identified through screening (i.e., speech and language services) 	

Question 2: Does the model improve health outcomes and well-being for children, families, and communities, including clinical health and social outcomes, and satisfaction with care?

Health and social outcomes and satisfaction with care are expected to improve through the universal provision of expanded services. The *standard of care* in the expanded model of pediatric care includes parenting and child development, behavioral health, family medical care, SDH, and community engagement. The package of services will vary by child and family based on need. For example, depending on level of need, families with newborns may receive one to three home visits, and some parents may already be up-to-date on their immunizations and do not need the vaccines offered through their child's pediatrician. Overall, through the provision of these services to anyone who needs and wants them, we hypothesize that health and social outcomes will improve for children and families. As shown in Table 2E, in the short-term we anticipate improved parenting skills, child behavior, and emotional regulation; decreased morbidity, including pertussis and flu among infants; improved family planning; and decreased rates of preventable emergency department utilization and hospital admissions.

Beyond outcomes that can be measured through clinical data, we hypothesize that other sectors will benefit from the expanded model as well. Anticipated outcomes include improved school readiness and reading levels, reduced absenteeism from school and work, improved high school graduation rate, reduced maltreatment and CPS involvement, and reduced juvenile delinquency. While these are important outcomes at the individual, family, and community level, they will be more challenging to measure directly as data sharing between organizations in different sectors will likely be required. It is also important to note that, while there is literature to support the anticipated short- and long-term outcomes anticipated in other sectors, this is based on the assumption of widespread implementation of the model. Thus some potential outcomes, such as decreased involvement with juvenile and criminal justice, may not be realized based on implementation of the model in a small number of practices.

TABLE 2E. LOGIC MODEL FOR EVALUATION QUESTION 2

Does the model improve health outcomes and well-being for children, families, and communities, including clinical health and social outcomes, and satisfaction with care?			
Target Population	Process Measures	Short-term and Intermediate Outcomes (<5 years)	Long-term Outcomes ¹ (≥5 years)
<ul style="list-style-type: none"> • Children • Parents/caregivers • Practice • Health plans • Community 	<ul style="list-style-type: none"> • Utilization of additional services: Home visits for newborns, extended well-child visits, early brain development programs, parenting consultations, parent helpline, behavioral health services, parental flu and Tdap vaccines, family planning, lactation consult services, and social services, etc. 	<p>Individual-level</p> <ul style="list-style-type: none"> • Improved language and social-emotional development • Reduced flu and pertussis among infants • Reduced morbidity among children (e.g., respiratory tract infections, ear infections, sudden infant death syndrome) • Decreased BH symptoms (using measurement-based care) • Improved child health index measure (e.g., “Thrive at Five” Cincinnati Children’s Hospital) <p>Family-level</p> <ul style="list-style-type: none"> • Improved parent-child interaction • Reduced parenting stress • Reduced behavioral health symptoms (using measurement-based care) • Improved family planning (e.g., birth spacing, reduced unintended pregnancy among mothers) • Increase in exclusive breastfeeding for 6 months • Decreased child exposure to second-hand smoke • Decreased unmet social needs • Increased parent satisfaction with pediatric care <p>Health care system</p> <ul style="list-style-type: none"> • Reduced preventable pediatric ED visit rate • Reduced pediatric inpatient admissions rate • Decreased per-member per-month health cost <p>School-based</p> <ul style="list-style-type: none"> • Increased school readiness • Improved third-grade reading level • Decreased absenteeism 	<p>Individual-level</p> <ul style="list-style-type: none"> • Improved early brain development • Decreased chronic disease • Decreased suicide rate <p>Family-level</p> <ul style="list-style-type: none"> • Reduced adverse childhood experiences <p>Health care system</p> <ul style="list-style-type: none"> • Behavioral health parity with physical health <p>School-based</p> <ul style="list-style-type: none"> • Increased school performance • Increased graduation rates <p>Societal outcomes</p> <ul style="list-style-type: none"> • Decreased teen pregnancy • Increased lifetime earnings due to increased high school graduation rate • Decreased CPS and legal system costs • Reduced juvenile and criminal justice involvement

¹Some of the long-term outcomes listed are included as short-term outcomes (<5 years) in the financial analysis. As explained in that section of the report, the short-term realization of outcomes, such as decreased involvement with juvenile and criminal justice, requires widespread implementation of the model across a very large population. For purposes of evaluation, a smaller-scale implementation is assumed and therefore the societal-level outcomes have been moved to long-term (≥5 years).

Question 3: Is the model financially sustainable?

The question of financial sustainability is important as it will require additional staff and resources to offer expanded services, many of which are not currently reimbursable through health insurance. To determine the financial impact of the model on the practice, it will be important to measure the number of unique patients in the panel, the number and type of services offered by each provider, reimbursement for services, and the costs incurred to implement the model, as shown in Table 3E. With additional staff to provide some of the additional services it is expected that providers may increase the number of patients they see per day, increasing annual revenue to help offset some of the cost for nonbillable services. Increased satisfaction with care is expected to increase patient retention and the overall panel size, both increasing annual revenue.

TABLE 3E LOGIC MODEL FOR EVALUATION QUESTION 3

Is the model financially sustainable?			
Target Population	Process Measures	Short-term and Intermediate Outcomes (<5 years)	Long-term Outcomes ¹ (≥5 years)
<ul style="list-style-type: none"> Practice Health plans 	<ul style="list-style-type: none"> Number of unique patients Number of services delivered by each provider Cost for new programs or services Cost for additional staff Cost for additional space and/or infrastructure Amount paid for expanded services 	<p>Increased revenue through¹:</p> <ul style="list-style-type: none"> Increased volume for behavioral health (as indicated in questions 1-2) Increased billable services offered to family members (i.e., postpartum depression screening, flu and Tdap vaccines) Increased number of patients seen per provider per day Decreased no-show rate Increased panel size Increased patient retention Increased annual revenue Increased bonus payments for improved quality and satisfaction (health plan) 	<ul style="list-style-type: none"> Increased number of value-based payment agreements Increased adoption of expanded pediatric practice

¹Sources of increased revenue may vary by clinic, such as increased per-member per-month revenue under a value-based payment system, etc.

METHODS

Evaluation methods will vary for different measures and outcomes. Both quantitative and qualitative methods will be necessary to fully evaluate the implementation and outcomes of the model.

Implementation evaluation. This framework does not provide a one-size-fits-all model, but is intentionally flexible to allow practices to implement services responsive to their patient and community needs and realistic in terms of their capacity. Each practice will need to develop its implementation plan (i.e., what is included in the model, who will provide the expanded services, how will patient data be collected and tracked, etc.). Some of the components of the model utilize existing programs, such as Family Connects, which have training, curricula, and specific implementation measures, which assist with maintaining fidelity.

Practices will need to identify key criteria from each component before implementation to monitor fidelity of the implementation. Methods to monitor fidelity are listed below.

- Observation: Evaluators observe practitioners implementing the intervention(s) and rate the level of adherence to the model (this can be live or video recorded)
- Self-report checklists: Practitioners complete checklists to describe whether key intervention activities were completed
- Case file review: Evaluators review case files and progress notes to determine adherence to the components of the model (i.e. chart review to review screening, referral, and follow-up)
- Surveys or interviews: Evaluators conduct surveys or interviews with practitioners, patients, and community members to determine adherence to the components of the model

While it's important to be responsive to the needs of children, families, and providers, it will be necessary to determine if the model is being implemented as planned to evaluate whether that version of the model was effective in that particular setting.

Outcome evaluation. To measure changes in particular outcomes, it is helpful to have a comparison practice or population. Ideally, the expanded practice would compare its outcomes to a similar non-expanded practice. If a comparison practice is not available, a less rigorous pre/post design could be used. In either case, it will be important to establish baseline levels for measures before implementation of the model.

DATA SOURCES AND DATA COLLECTION

Several data sources and collection methods are needed to evaluate the implementation of the model. Some data will be collected as part of standard practice, additional data collection instruments and processes may need to be adopted or developed, and other data may need to be requested from external entities to evaluate the expanded model. The lists below include potential data sources needed to evaluate implementation of the model, but should not be considered exhaustive.

Practice-level data:

- Electronic health records (EHR): Screening results, referral information, care coordination, and provider notes are key data elements stored in the EHR. It will be necessary to be able to run reports that include screening tools and scores, referrals, and follow-up, as well as other data elements necessary to measure additional outcomes.
- Claims data: Services for which provider time is billed, diagnoses, and payment amounts are accessed through billing or claims data. These data are important for tracking billable services provided, and non-billable services may also be recorded here, depending on the practice.
- Financial data: Practice-level financial data is needed to evaluate the fiscal impact of implementation of the model. Costs associated with any new providers or staff are needed to compare with revenue general by the practice. These costs include salary and fringe benefits, EHR license fees, malpractice insurance; monthly facility expenses such as rent and utilities for any new space; and screening tool fees, etc.
- Screening instruments: Some of the universal screening instruments used to detect more targeted needs, can also be used to benchmark and measure changes in outcomes (i.e., percentage of patients with normal communication and social-emotional screens on the ASQ and ASQ-SE). It is important to note when screenings are administered, but also to have access to scores that are often maintained in the EHR.
- Surveys: Parent satisfaction is typically measured through a survey, such as the patient experience surveys available through Consumer Assessment of Healthcare Providers and Systems (CAHPS).
- Documents for review: The implementation plan may be reviewed to determine if the model was implemented as intended. Additional documents for review include formalized partner agreements, such as memorandums of understanding, contracts, data use agreements, etc. Written practice policy documents may also be reviewed to determine adherence to the model, including new work flow processes needed. For example, while some referral data may be kept in the patient's EHR, it will be important to close the feedback loop for patients with referrals to determine if social needs have been met – the documentation used to track this information can be used in the evaluation.

Data collected specifically for model evaluation:

- Interviews and focus groups: Individual or group interviews or focus groups may be conducted among providers, staff, parents, and community partners to learn more about the “lived experience” of implementing the model. These methods may be used to collect data to identify successes, challenges, and lessons learned to make recommendations for improvement and guide decision-making with respect to model implementation.
- Surveys: Validated or practice-specific surveys will allow the practice to learn more about the experience of care directly from their patients and families.
- Some of the components of the model have specific evaluation instruments that can be used to evaluate the effectiveness of that component (i.e., for the parenting consultations following the Triple P Level 3 model, there is a pre/post “Parenting Experience Survey” to assess for changes in parenting).

Data from external sources:

- Health plan/managed care organizations: ED visits, inpatient admissions, etc.
- School system data: Absenteeism, third-grade reading level, etc.
- Child welfare system: Referrals to Child Protective Services (CPS), maltreatment fatalities and non-fatalities, length of time in foster care, etc.
- Juvenile and criminal justice systems: Incarceration rate, etc.

DATA ANALYSIS

Various quantitative and qualitative methods will be needed to analyze the data and evaluate the success of the model. Quantitatively, descriptive and inferential statistics would be used to describe provision of services and compare outcomes between those who received care through the model and those who received standard care. Descriptive statistics include frequencies, measures of central tendency, variation, etc. Inferential statistical methods may include, but are not limited to, t-tests, correlation, regression analyses, difference-in-difference comparisons, factor analysis, and latent class modeling, all depending on the specific outcome and availability of data.

Qualitative methods would be used to identify and better understand the reasons why something may or may not have worked as planned and learn what adaptations may be needed to improve the model in a particular setting. Qualitative analysis methods may include, but are not limited to, content analysis and thematic analysis, based on the evaluation measure and data availability.

ASSUMPTIONS

- Some outcomes will be realized by entities other than the practices (i.e., health plans/managed care organizations, school systems, etc.).
- The outcome estimates are based on widespread implementation, not a single clinic, particularly for outcomes with low incidence such as incarceration. To realize the outcomes in this model will require broad implementation across many clinics.
- This evaluation plan assumes that aggregate data/reports can be queried from the EHR for results of screening and referrals, etc.

REPORTING

Finally, evaluation results will need to be reported. The reporting schedule should be determined based on needs and expectations of stakeholders. Reports should be shared with all stakeholders, including funders, providers, staff, parents, community partners, and the community at large. Quarterly updates, interim reports, and final reports can be used to share outcomes and guide decision-making with respect to continuation, modification, or termination of the model implementation.

APPENDIX F

Evaluation Measure Specification Template

Measure	Description
Definition of measure	
Population (pediatric patients, caregivers, community, etc.)	
Type of measure (select):	<ul style="list-style-type: none"> • Output (process measure/counts of services delivered) • Short-term outcome (change in condition, knowledge, attitude, belief, etc.) • Intermediate outcome (change in behavior, clinical change) • Long-term outcome (structural change - policy, program, practice)
Measure steward or source, if applicable (e.g., HEDIS)	
Technical specifications (how will the measure be calculated)	<ul style="list-style-type: none"> • Denominator (if applicable) • Numerator (if applicable)
Exclusion criteria	
Data source(s)	
Data collection method(s)	
Subgroup(s)	
Benchmark or target	
Data considerations and potential limitations	

Notes.

