Review Article

Implementation strategies in co-located, coordinated, and collaborative care models for child and youth mental health concerns

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Abstract: Time has come for integrated care and over the past 30 years a broad array of approaches have been implemented across the country, and internationally, both with adults and youth. The approach has struck a chord with pediatric primary care clinicians (PPCCs), child psychiatrists, psychologists, other mental health (MH) workers, governments, insurers, corporations, and the public. Approaches can be considered as a continuum, from coordinated, to co-located, to collaborative or fully integrated programs. Each level is described and reviewed. There are strengths and weaknesses for each approach, yet all aim to increase access to care, to support primary care to expand their scope of work, and to promote integration between medical and behavioral health services. Coordinated programs, often referred to as child psychiatry access programs in the US have seen widespread adoption and are feasible, well received, but require subsidization by grants or contracts. Co-located programs can be more easily self-sustaining but depend more on the individuals involved and are administratively separate from the primary care practice. Collaborative care is the most complex and integrated of programs but is the most expensive as well. Limited research has best supported collaborative care and more research is clearly needed to establish the effectiveness of these programs for patients, PPCCs, population health, and MH professionals. While most integrated care programs are based in the US and Canada, concepts of integrated care are beginning to be implemented globally. The arc of history appears to be bending towards greater integration and future systems of payment will be critical in determining the speed with which this occurs.

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"*The time, perhaps, is past when the pediatrician needs to be urged to consider the mental as well as the physical health of his patients. Organized pediatrics has increasingly recognized its strategic position in the prevention and treatment of children's behavior and personality disorders.*"—Hale Shirley, MD. *Psychiatry for the Pediatrician*, 1947.

Given twists and turns over the years, it may be surprising that this statement was made so long ago but pediatrics and child psychiatry have long been intertwined and interconnected. Pediatricians were instrumental in the origins of child psychiatry and many of the seminal child psychiatrists were pediatricians (1,2). In the past

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10–15 years there has been a renewed focus on mental health (MH) within pediatrics, with the first American Academy of Pediatrics (AAP) endorsed competencies in MH published in *Pediatric*s in 2009 (3) and updated in 2019 (4,5). Over that time the focus on MH has grown exponentially in the field. The website of the AAP has an impressively robust section on MH. Virtually every issue of *Pediatrics* and *Journal of the American Medical Association (JAMA) Pediatrics*, the flagship journals for the field, have multiple articles on MH. The Association of Pediatric Program Directors and the American Board of Pediatrics have made improving competence in MH a national priority (6). These are all very good things for children as 16% have a MH disorder and at least 50%, possibly 75%, receive no treatment in the US (7). Further, in the past 10 years there have been increasing numbers of children and adolescents with disorders (8,9), numbers of children in Emergency Departments (10) with MH concerns, and the suicide rate has become the 2nd leading cause of death for US 10–24 years old (11). These trends have accelerated during COVID (12,13).

While the numbers of child and adolescent psychiatrists (CAPs) in the US have grown, this has not kept pace with increases in population or rates of disorder. It is clear that the 9,000 practicing CAPs alone will not be able to meet these population health needs. MH clinicians and allied support professionals from multiple child- and family-serving fields have been essential to address these growing child MH service needs. Community health workers and early intervention specialists engage children and families when early developmental concerns arise. Social workers, psychologists, and other MH and substance abuse counselors work with children, adolescents and families to build psychosocial skills. School psychologists, guidance counselors, and social workers provide critical foundational emotional support to a broad swath of children. While there are 35,000 child psychologists and many more master's level child psychotherapists (master's in social work, marital and family therapists, MH counselors, etc.) to provide crucial MH care for children and adolescents, there remains a tremendous need for medical assessment, oversight, and medication management. Pediatric primary care clinicians (PPCC) are not only much larger in numbers than CAPs [89,000 general pediatricians; 141,000 family medicine physicians, 15,000 pediatric nurse practitioners (14)], but are well positioned to address the public health need. They embody integrating mind and body, have embraced the patient-centered medical home model, are easily accessible, and offer the "primary care advantage" of longitudinal relationships and established trust with children and families. But PPCCs cannot do it alone. As the Competencies state: "*Transformative changes in the health care delivery system—payment for value*, *system and practice-level integration of mental health and medical services*, *cross-discipline accountability for outcomes*, *and the increasing importance of the family and patient-centered medical home—all have the potential to influence mental health care delivery*." (4). While increasing education in MH is crucial for PPCCs, systems changes are also fundamental. These systems changes are often referred to as integrated care. Over the last 20 years many have promoted integrated care models to engage pediatric primary care in assisting to meet this public health need. Yet, as has been pointed out in the most recent MH Competencies for Pediatric Practice, there continues to be minimal and insufficient training during pediatric residency and most practitioners feel ill equipped to assess and manage these children. This paper addresses the history of efforts to implement integrated care in the US, a model of the continuum of integrated care, the research associated with each level, and examples of the implementation of each level.

Background

The term integrated care has a history that is important to review. The relationship between pediatrics and child psychiatry has been critical from the beginning of the field of child psychiatry, and the first child psychiatry clinic in the US was established within the Harriet Lane Pediatric Clinic at Johns Hopkins by Leo Kanner in 1930 (1). Subsequently efforts to integrate child psychiatric services were largely done by child psychiatric consultation-liaison services in hospital settings from the 1950s onward. In the 1960's a trio at University of Rochester consisting of George Engel, a psychiatrist, Robert J. Haggerty, a pediatrician and Stanford Friedman, a child psychiatrist, began promoting the ideas of a biopsychosocial model (15) of child health and Dr. Haggerty labeled psychosocial problems "the new morbidity" (16). The latter two became vigorous proponents of an integrated behavioral and physical health care system and advocated that developmental and behavioral pediatrics were the backbone of pediatrics (17). Across disciplines, an emphasis on promoting healthy emotional development, screening for and identifying significant emotional health issues, and active interventions for less serious MH challenges has been explored in many

different iterations over time in pediatric primary care, although perhaps without the sustained embrace of the last few decades (18).

An ambulatory integrated care program with adults began in the Washington's Advancing Integrated Mental Health Solutions (AIMS) model of collaborative care in 1994. This model entailed use of care coordinators and psychiatrists located on site and integrated into the primary care team to care for patients with depression. With the success of this model, efforts moved to extend this model to adolescents with depression in the early 2000's.

Shortly thereafter two initiatives were developed that rapidly spread across the nation and in one case internationally as well. The first was the Massachusetts Child Psychiatry Access Program (MCPAP) (19) and the second was the Patient-Centered Mental Health in Pediatric Primary Care Program (PPP; formerly known as the Pediatric Psychopharmacology Program) begun at Columbia University and now housed at The REACH Institute (The Resource for Advancing Children's Health), both of which began in 2004. The MCPAP program utilized case managers and CAPs to provide off-site telephonic consultation and linkage/referral assistance to PPCCs across an entire state. This model was adapted in Washington state with the PAL program in 2007 (20) and then in 2010 in New York with Project TEACH (Training and Education for the Advancement of Children's Health), also known as CAP PC, (Child and Adolescent Psychiatry for Primary Care) and CAPES (Child and Adolescent Psychiatry Education Services), which included elements of both initiatives (21). Since that time more than 30 states (www.nncpap.org) have developed similar child psychiatry access programs that have fostered increased access to care by providing real time consultation support and improving competence of PPCCs in assessing and managing mild-moderate MH problems. It is important to underscore that the intent of pediatric integrated care programs has not been to promote PPCCs taking care of children with severe mental illness. Although PPCCs have an important role to play in ongoing care for these children, they primarily remain in the province of the MH system.

The second initiative, PPP, begun in 2004 was designed to help teach primary care clinicians how to assess and treat MH conditions of children and adolescents through an intensive mini-fellowship model that has two parts. The first is an intensive skill building 3-day workshop that teaches assessment and treatment skills through interactive activities based on adult learning theory (22,23). It is taught by a combined faculty of PPCCs and CAPs. The workshop is followed by a biweekly set of collaborative office rounds for 1 hour, biweekly over a 6-month period, in which small stable groups of PPCCs discuss challenging cases in which they are using their new skills in their practices. It is designed as a peer-learning exercise and each call is facilitated by a faculty pediatrician and CAP. This program has trained more than 5,000 primary care clinicians and has been extensively evaluated and has been shown to increase provider confidence and competency in assessing and treating MH problems in children and their confidence (24). A recent Canadian evaluation of the program showed that it reduced MH hospitalizations and increased the acuity level of referrals on a population basis (25). Further, Hargrave *et al.* have demonstrated that the greatest benefit of the consultation services provided in TEACH has been for those who have participated in the skill building component of the PPP program (26).

Confusion has arisen around terminology so we address that here. Substance Abuse and Mental Health Services Administration (SAMHSA) has proposed a model for thinking about differing models of integrated care, ranging from coordinated care, to co-located care, to Integrated or collaborative care (27). Small "i" integrated care refers to all the various models of bringing primary care and behavioral health together. Large "I" Integrated care generally is synonymous with fully integrated, collaborative care. SAMHSA has organized this continuum along levels 1–6, with 6 being the most fully integrated. This model is illustrated in *Table 1*. While helpful, this conceptualization can be confusing as implying that level 6 is "better" than 1 for example. In reality each model has strengths and weaknesses. *Table 2* outlines these. As we will describe later, while the evidence base for level 6 is better, overall it is considered modest (28-37).

Implementing integrated care

Integrated care often involves the utilization of child psychologists or master's level child psychotherapists in some manner within the pediatric primary care setting. They are critical in assisting with implementing screening and work flow process, and providing consultation, prevention, brief psychotherapy, and coordination of care with schools and other MH providers (38). Much of this paper will focus on integrated care utilizing CAPs. General principles of implementation of child psychiatric integrated care programs were described well by American Association

Table 1 Six levels of collaboration/integration (core descriptions)

Coordinated (key element: communication)		Co located (key element: physical proximity)		Integrated (key element: physical change)	
Level 1: minimal collaboration	Level 2: basic collaboration at a distance	Level 3: basic collaboration onsite	Level 4: close collaboration onsite with some system integration	Level 5: close collaboration approaching an integrated practice	Level 6: full collaboration in a transformed/merged integrated practice
Behavioral health, primary care and other healthcare providers work					
In separate facilities, where they: ❖ Have separate systems ❖ Communicate about cases only rarely and under compelling circumstances ❖ Communicate, driven by provider need ❖ May never meet in person ❖ Have limited understanding of each other's roles	In separate facilities, where they: ❖ Have separate systems ❖ Communicate periodically about shared patients ❖ Communicate, driven by specific patient issues ❖ May meet as part of larger community ❖ Appreciate each other's roles as resources	In same facility, not necessarily same offices, where they: ❖ Have separate systems ❖ Communicate regularly about shared patients, by phone or e-mail ❖ Collaborate, driven by need for each other's services and more reliable referral ❖ Meet occasionally to discuss cases due to close proximity ❖ Feel part of a larger yet non-formal team	In same space within the same facility, where they: ❖ Share some systems, like scheduling or medical records ❖ Communicate in person as needed ❖ Collaborate, driven by need for consultation and coordinated plans for difficult patients ❖ Have regular face-to-face interactions about some patients ❖ Have a basic understanding of roles and culture	In same space within the same facility (some shared space), where they: ❖ Actively seek system solutions together or develop work-a-rounds ❖ Communicate frequently in person ❖ Collaborate, driven by desire to be a member of the care team ❖ Have regular team meetings to discuss overall patient care and specific patient issues ❖ Have an in-depth understanding of roles and culture	In same space within the same facility, sharing all practice space, where they: ❖ Have resolved most or all system issues, functioning as one integrated system ❖ Communicate consistently at the system, team and individual levels ❖ Collaborate, driven by shared concept of team care ❖ Have formal and informal meetings to support integrated model of care ❖ Have roles and cultures that blur or blend

Center for Excellence for Integrated Health Solutions. Available online: https://www.thenationalcouncil.org/wp-content/uploads/2020/01/CIHS_Framework_Final_charts.pdf?daf=375ateTbd56

Table 2 Strengths and weaknesses by levels of integration

Coordinated		Co located		Integrated	
Level 1: minimal collaboration	Level 2: basic collaboration at a distance	Level 3: basic collaboration onsite	Level 4: close collaboration onsite with some system integration	Level 5: close collaboration approaching an integrated practice	Level 6: full collaboration in a transformed/merged integrated practice
Advantages					
❖ Each practice can make timely and autonomous decisions about care ❖ Readily understood as a practice model by patients and providers ❖ Lower upfront investment costs ❖ Fewer MH professionals needed	❖ Maintains each practice's basic operating structure, so change is not a disruptive factor ❖ Provides some coordination and information-sharing that is helpful to both patients and providers	❖ Colocation allows for more direct interaction and communication among professionals to impact patient care ❖ Referrals more successful due to proximity ❖ Opportunity to develop closer professional relationships ❖ Generally does not require additional funding; services billed	❖ Removal of some system barriers, like separate records, allows closer collaboration to occur ❖ Both behavioral health and medical providers can become more well informed about what each can provide ❖ Patients are viewed as shared which facilitates more complete treatment plans	❖ High level of collaboration leads to more responsive patient care, increasing engagement and adherence to treatment plans ❖ Provider flexibility increases as system issues and barriers are resolved ❖ Both provider and patient satisfaction may increase	❖ Opportunity to truly treat whole person ❖ All or almost all system barriers resolved, allowing providers to practice as high functioning team ❖ All patient needs addressed as they occur ❖ Shared knowledge base of providers increases and allows each professional to respond more broadly and adequately to any issue ❖ Able to address population health
Disadvantages					
❖ Services may overlap, be duplicated or even work against each other ❖ Important aspects of care may not be addressed or take a long time to be diagnosed ❖ Needs grant funding	❖ Sharing of information may not be systematic enough to effect overall patient care ❖ No guarantee that information will change plan or strategy of each provider ❖ Referrals may fail due to barriers, leading to patient and provider frustration	❖ Proximity may not lead to greater collaboration and consultation, limiting value ❖ Effort is required to develop relationships ❖ Limited flexibility, if traditional roles are maintained ❖ Separate EMRs ❖ Usually little access to child psychiatrists	❖ System issues may limit collaboration ❖ Potential for tension and conflicting agendas among providers as practice boundaries loosen	❖ Practice changes may create lack of fit for some established providers ❖ Time is needed to collaborate at this high level and may affect practice productivity or cadence of care ❖ Larger upfront investment ❖ Requires more availability of MH professionals ❖ Often requires supplemental grant funding	❖ Sustainability issues may stress the practice ❖ Few models at this level with enough experience to support value ❖ Outcome expectations not yet established

EMR, electronic medical record.

of Child and Adolescent Psychiatry (AACAP) in 2010 (39). Regardless of level of integration, programs are guided by the following principles: "*Collaborative mental health care partnerships represent integrated care approaches in which the PCCs and CAPs partner with children and their families to prevent, identify early, and manage mental health problems in the primary care setting. Successful partnerships begin with the development of systematic and regular communication between PCCs and CAPs.*". The ingredients for successful programs include:

(I) Timely, "real time" access to child psychiatric "curbside" consultations with PPCCs. This may happen in person, by telephone, or telehealth but needs to be capable of "just in time" opportunities. The child MH professionals need to understand the rhythm and challenges of primary care practice.

(II) Communication protocols to maintain clear expectations on both sides. Discussion of how the program will work needs to take place before the program is implemented. Written agreements and care pathways can be very helpful for both child psychiatrist consultants and PPCC practices. This prevents misunderstandings which can threaten collaborative care programs.

(III) The availability of timely direct consultation with patients and families. The ability to access a face-to-face (FTF) or telehealth CAP consultation within a few weeks is another crucial component of successful programs. Written reports of the consultation should be expected and made available to the PPCC within a few days, as in any specialist consultation.

(IV) The availability of care coordination to assist families in navigating the human services and MH system to access services. Successful integrated care programs provide assistance to families in obtaining and making appointments for MH care, understanding and obtaining services from schools, developmental disabilities agencies, social services, the courts, and human services programs. The amount and intensity of care coordination varies across integrated care programs ranging from minimal to extensive, including follow up with the family and PPCC to assure appointments are kept and communication maintained.

(V) Providing informal and formal education for PPCCs in children's MH. Although there is education inherent in curbside consultations, programs vary in the degree to which they provide formal education programs to PPCCs. Some programs provide occasional lunch and learn sessions, while others may provide longer multiple-hour programs on an array of topics, and still others intensive multiple-day CME courses (e.g., REACH PPP). Webinars, archived recorded programs, and online educational resources are offered by many integrated care programs.

Other ingredients that make a fundamental difference for PPCCs include facilitated access to child psychologists and/or master's level therapists to provide evaluations, short term treatment, communication with other professionals involved with the child (e.g., schools, teachers, social services, legal, MH agencies, etc.), and coordination of care. These professionals also make crucial differences in the implementation and efficient work flow in the practice for care of children and adolescents with MH needs, including population health and measurement-based care approaches.

Coordinated programs

With respect to child psychiatry and pediatrics integration, coordinated programs are the most common in the US. There are currently 36 large-scale coordinated programs, which provide off-site services to a large geographic region or entire state. The National Network of Child Psychiatry Access Programs maintains a website detailing each of the programs (www.nncpap.org). Programs are generally funded by state grants or legislative budgets (12 states currently), supplemented recently by Health Resources Service Administration federal grants (20 states), and in at least one state, insurance companies. These programs each have their own unique structure and approach but include rapid access to CAPs for phone consultation, options for expedited FTF consultations, and assistance with linkage and referral. Some provide short term bridging psychotherapy for situations where access to MH services is expected to be lengthy. Most also provide formal, Continuing Medical Education Programs. Strengths of these programs are that they are feasible, sustainable, and well accepted by PPCCs and CAPs. Currently these services are not billable for CAPs or PPCCs under commercial insurance or Medicaid. Advocacy has been underway for some time to include these services as billable and may become so in future payment systems. Coordinated programs generally provide access to child psychiatric expertise to every PPCC in a state or large region. The weakness of such programs is that they advise,

educate, and support but do not have the ability to enforce population health approaches and measurement-based care. They are also not able to track patient outcomes on cases for which they assist. Coordinated programs also do not have leverage or influence, aside from persuasion, to ensure practice change (e.g., use of rating scales, work flow and organization, care pathways, billing practices). Research has shown that these programs increase the level of confidence and self-assessed competence of PPCCs (29,34,35). Improved prescribing of selective serotonin reuptake inhibitors (SSRIs) and atypical antipsychotics has also been demonstrated (29,30). Most notably these programs promote increased access to care for youth. This model has been the most widely adapted nationally and reflects the model's practicality, feasibility, and endorsement by PPCCs.

Case study: project TEACH regions 1 and 3 (initially known as CAP PC)

In response to the 9/11 tragedy the Reaching Children Initiative developed a tri-state (New York, New Jersey, Connecticut) educational effort for pediatric primary care practitioners with a focus on a trauma-specific MH care and response to community disasters (40,41). Formulated by an interdisciplinary team with many of the members of PPP and inclusive of a parent educator, pediatricians, psychologists, and psychiatrists this effort was evaluated and significant changes were demonstrated in self-efficacy specific to diagnostic skills and knowledge of clinical treatment strategies for targeted MH content. These efforts were continued at the state level, prompting discussions initiated by the New York State AAP leadership resulting in the New York State Office of Mental Health issuing a request for proposals in 2009 to develop a coordinated care program for children and adolescents in the state under the umbrella of Project TEACH (42,43). In 2010, CAP PC was awarded the contract for providing services for 46 of New York's 62 counties. This represented 90% of the pediatric population of the state, including New York City, Long Island, and Central and Western New York State. The contract for services in Albany and the North Region was awarded to the CAPES program based in Four Winds Hospital. Since the original award, CAP PC and CAPES were refunded in refunded in 2012 for 2 additional years, and then again for 1 year in 2015. In May 2015 New York State put out a new RFP with three regional providers and the designation of a statewide coordination center to provide oversight to the program as a whole. In August 2015 CAP PC was awarded a 5-year extension to cover regions 1 and 3 (38 counties of New York State and 80% of the population). Increased funding was awarded to expand access to the program by all pediatric prescribers including those in MH and psychiatric settings. CAPES was given the contract to continue to provide services to region 2. The Massachusetts General Hospital Psychiatry Academy was named the statewide coordinating center for New York State and has been responsible for coordinating services and programs across all three regions.

The goals and vision of Project TEACH are to improve the public health of children and adolescents across New York state by addressing the unmet need for MH services by: (I) bolstering PPCCs' ability to assess and manage mild-moderate MH problems and (II) promoting collaboration and integration of health and MH services.

Project TEACH has done this by providing formal education for PPCCs together with phone consultation support, assistance with linkage/referrals, and FTF evaluations. Project TEACH regions 1 and 3 services are provided by a collaboration of five university-based child psychiatry divisions at the University at Buffalo, University of Rochester, Columbia University Medical Center/NYS Psychiatric Institute, SUNY Upstate Medical University in Syracuse, and Hofstra Northwell School of Medicine. Each of the five groups has a site team with 2–3 senior CAPs (all on faculty at their respective institutions) and 1 liaison coordinator who assists with the program broadly and specifically is responsible for appropriate linkage and referral support for PPCCs. The liaison coordinator minimally has a master's level degree in a MH field. Project TEACH regions 1 and 3 has one toll-free phone line for PPCCs in all covered areas and rotates coverage among the five teams, with each team covering 1 day per week. There is one full time equivalent (FTE) administrator for the program. This team works closely together, with weekly conference calls to coordinate planning and assure communication and consistency across the program in clinical cases. The program provides phone consultation and linkage/referral support in real time Monday–Thursday 8–7 and Friday 8–5, as well as FTF consultations for selected cases. FTF evaluations are offered for those cases in which the additional guidance obtained from a direct consultation would allow the PPCC to be able to manage the patient within the primary care setting. The FTFs are provided at our hub sites so that no family has to travel >2 h to get an evaluation. The evaluations are completed by one of the CAP PC site CAPs an average of 12 days after the phone

consultation. The program additionally offers telepsychiatric evaluations for families who live more than an hour away from one of our hubs. During the COVID pandemic all FTFs have been through telehealth. The program does not offer FTFs for urgent or emergency situations, or cases that clearly belong in the MH system. For these cases Project TEACH assists in linkage and referral to the appropriate level of care. Formal education has been emphasized and is offered in an intensive 18-hour program annually as well as briefer 5-hour programs on site at PPCC practice sites. The programs focus on ADHD, anxiety, depression, aggression, and trauma. Project TEACH maintains an active website for PCCs and the public (www.projectteachny.org). Three thousand three hundred and thirty-six PPCCs have registered for the consultation program. From inception the program has provided 14,769 CAPs phone consultations, and 1,046 additional FTF evaluations involving 12,800 children. 1,217 PPCCs have completed CME programs and in total the program has provided over 27,266 CME hours. Feedback has confirmed increased confidence and self-assessed skills. Two-week follow-up surveys confirm that 93.4% of consultations were very helpful or extremely helpful. Over 99% would recommend the program to other PPCCs. These percentages have been consistent across all years of the program.

Co-located programs

Co-located programs have been in existence for over two decades (32,44). Typically these involve a MH agency or practice partnering with a primary care practice to provide MH care on site to the primary care office(s). With adults a reversed model has occurred with primary care practitioners co-locating in MH settings but this has not been utilized in pediatric settings and will not be discussed further here. In co-located models, the MH agency typically has a formal agreement with the primary care practice to prioritize treatment for their patients. Typically these programs involve the co-location of master's level psychotherapists or psychologists, but do not include access to child psychiatrists. At the current time there is generally no funding available for the MH agency aside from fee for service payments. As a result these programs provide easy access to MH services but do not generally incentivize communication or collaboration on cases. Electronic medical records (EMRs) are separate and belong to each group. Population health approaches may occur but this is not a fundamental aspect of co-located programs. These programs have demonstrated increased levels of engagement, including higher first appointment attendance and higher rates of MH treatment (29). As of yet there is no evidence for improved patient outcomes. One survey of pediatricians found that there was no increase in the frequency of comanaging patients, nor any differences in the likelihood of identifying, treating or referring children with common MH diagnoses (45). These programs are likely an improvement in access to varying levels of MH treatment, undoubtedly an improvement from the status quo in many communities. While an important strategy to increase access to care, it appears that to be effective co-location must go beyond placing MH clinicians in proximity to primary care. Good and ongoing communication, agreed upon pathways of care, and written agreements between each party can strengthen these models to provide improved, more coordinated MH treatment in primary care settings.

Case study: Amherst Pediatrics-Best Self Behavioral Health co-location

A PPCC from Amherst Pediatrics, a group pediatric private practice in Western New York, had a long relationship with Best Self Behavioral Health, a large MH agency in the Buffalo, New York region. In 2011, the PPCC and the director at Best Self began talking about ways to "think outside the box" in delivering MH services that would decrease stigma, insure follow-through/linkage when a pediatrician referred a patient for therapy, and increase the collaboration between therapist and pediatrician/primary care. The agreed on solution was an on-site satellite clinic at the pediatric office. The PPCC practice donated the space (one room) and provided the required furniture (couch, two chairs, small desk/chair, child sized table/chairs) as well as internet access and phone at no cost to the agency. The therapy room was located near a waiting room and restroom. Two therapists provided 6–8 appointment hours per week each for Amherst Pediatrics patients. Group sessions of dialectical behavior therapy (DBT), a treatment for adolescents with problems of emotional regulation, were added one night per week using the practice conference room. Scheduling and billing were done through the agency. The room and co-located program was inspected and licensed by the State Office of Mental Health.

The no show rate was drastically reduced in patients that were referred to and seen at the pediatric office. One of the therapists remained in this role throughout the time that the satellite clinic model was in use [2011–2020]. This long-term relationship with the pediatricians and

close collaboration (information sharing, medication consult, recommendations, medical questions in relation to symptom presentation or treatment) was seen as invaluable. The practice came to trust and rely on this collaboration. The 2nd therapist position was not as stable, and several therapists were in this role but none long enough to develop the strong collaboration that the first had with providers.

During this time, the practice hired an integrated care master's level behavioral health clinician who became "point person" for referrals, managing time for collaborations, overseeing physical needs of the space as well as developing EMR tools for referrals, initial assessments, and medication consults. Initially this was paid for through a grant from a local insurance company but has been sustained by insurance billing subsequently. The addition of this behavioral health clinician enhanced the efficiency and collaboration between primary care and the co-located MH agency clinic.

In 2014 additional office space became available. Because of the very positive experience with the MH agency, the practice recruited a private practice clinical psychologist with a different skill set (specializing in the treatment of autism, parent-coaching for ADHD, and autism evaluations). This collaboration lasted for 5 years and was very positive as well until the psychologist relocated.

In 2019, the practice extensively remodeled their offices and determined that one end of the building was not necessary for the practice. In discussing subleasing, the practice prioritized MH collaboration. The practice proposed the idea to the same MH agency as had provided the co-located services. An agreement was formalized and the new clinic remains independent of the pediatric office, provides their own billing and scheduling, utilizes their own EHR, and sees patients from the community that are not exclusively practice patients. Best Self continues to provide DBT groups utilizing the practice conference room, and now has multiple staff members in the larger co-located space. Their close proximity allows for the continued close collaboration with pediatricians/primary care, decreased stigma, and higher rates of follow through (fewer no shows) for patients. This co-location has remained very well received by both Amherst Pediatrics and Best Self, and very popular with patients and families.

Integrated/collaborative care programs

Integrated or collaborative care programs are considered the most highly developed levels of integration of behavioral and physical health services. Because of the complexity, high need for staffing, and upfront costs these programs are relatively few in number. Noteworthy examples include Montefiore Einstein's Behavioral Health Integration Program (46), University of Pittsburgh Medical Center's Children's Community Pediatrics Behavioral Health System (CCPBHS) (47), and University of Washington's AIMS Center (48). The AIMS Center effectively established that integrated care models in adult populations could improve MH outcomes and demonstrate cost-effectiveness over time. Subsequent research from the AIMS Center also demonstrated improved outcomes and cost-effectiveness in depressed adolescents.

These programs are staffed by care managers, master's level therapists, and CAPS who are located on site and fully integrated with the PPCCs into the primary care practice. A team based, population-health approach is taken with a shared EMR, tracking of registries, informal curbside consultations, formal case conferences, brief therapy, and stepped care and evidence-based algorithms (49). The care manager, therapist, consulting psychiatrist, and PPCC work collaboratively to optimize treatment for an individual patient, all the while utilizing measurement-based care principles. Research is most robust for this level of integrated care but still must be considered modest (28,29,31,33,35-37). The best evidence supports the use of this model in the treatment of depressed youth in the primary care setting (29,33). Engagement with treatment, care coordination, and provision of on-site brief cognitive behavioral therapy (CBT) are all enhanced by this model. Results demonstrated improved rates of response and remission (effect size d=0.63), as well as increased patient satisfaction.

While the CCPBHS model is a strong one that can and should be emulated throughout the country, there are also smaller integrated care models operating in less optimal resource settings or in less integrated health care settings. On a smaller scale State University of New York Buffalo's Integrated Care for Kids (InCK) (50) program utilizes this collaborative care model in four primary care practices, with central care coordination, embedded therapists offering short- and intermediate-term evidence-based therapies, and child psychiatrist-led consultations, bridging treatment, and training and education for primary care clinicians. As with other similar smaller programs, InCK's ongoing financial sustainability relies primarily on fee-for-service billing, although it also receives financial support for care coordination and partial child psychiatry time from a

regional independent practice association/accountable care organization.

Case study: CCPBHS (Pittsburgh, Pennsylvania region)

The CCPBHS was initiated in the mid-2000s by Children's Community Pediatrics (CCP), a subsidiary of Children's Hospital of Pittsburgh. CCP has 160 pediatricians and 35 APCs that offer pediatric primary care in Western Pennsylvania covering over 190,000 lives. The process was driven by CCP to bring together the Children's Hospital and Western Psychiatric Institute in Pittsburgh, one of the largest behavioral health care providers affiliated with an academic medical center in the USA. CCP recognized and was frustrated by the lack of access to MH providers, especially CAPS and drove the process to establish the mission to transform their practices by including the delivery of behavioral health services in their medical home. Buy-in from all three institutions was crucial and a mission statement was adopted to "*create a financially sustainable, integrated behavioral health service in the pediatric medical home that focuses on providing early access to empirically supported nonpharmacologic interventions (therapy), while simultaneously providing access to pharmacologic interventions*.". Start up funding was provided by the Children's Hospital of Pittsburgh. Leaders from all three institutions met quarterly for several years before the program was opened. There were two separate EMRs and quickly this was addressed to move the behavioral health records into the primary care EMR with sufficient safeguards for confidentiality of patients. Common screening instruments were integrated into the EMR. Care pathways were developed that defined the action steps for PPCCs and the MH team. Education was provided to PPCCs on these care pathways. Administrative staff were also provided training and education in behavioral health managed care organizations and the nuances of insurance coverage. The pediatric network has initiated and sustained a full-scale adolescent screening project, postpartum depression project, and is in the midst of scaling up a substance abuse screening for youth age 11 and up. The program hired 20 licensed master's level psychotherapists for 21 practice sites and in 2016 saw 17,206 visits. There are 5.0 FTE care coordinators who assist with linkage/referral and assist families in navigating systems. There is also 2.0 FTE CAPs for the program. One CAP acts as the Medical Director of the program and provides education and consultation. The CAPs provide supervision to the psychotherapists, education for PPCCs and staff, curbside consults for PPCCs, and evaluations and brief management for individual patients in collaboration with the PPCC and psychotherapist. The show rates for appointments with the behavioral health team are over 90%, much higher than seen in MH treatment agencies. The program has been well received by PPCCs, CAPs, patients and families. Currently CCPBHS is supported entirely by a third-party billing and the infrastructure of the pediatric practices.

Integrated care in low- and middle-income countries (LAMIC)

Expanding access to child MH care remains a challenge across the globe. Integrated care approaches are perhaps more important in LAMIC than in better resourced countries given the tiny numbers of trained MH staff (51,52). Efforts at integration have begun to occur and often target training of other professionals (e.g., nurses) or community health workers. This task shifting and sharing is an important direction to expand access in LAMIC. As with other public health priorities, numerous studies have demonstrated the effectiveness of community health workers in delivering evidence-based MH interventions to children and families in community and school settings (53-58). Still, the World Health Organization identified major barriers to the development of MH services in resource-challenged settings, including the complexity of integrating MH services into primary care services that are often already overburdened and under-resourced (59). A pediatric integrated care program in Tehran, Iran, is currently assessing a collaborative care model supporting general practitioners treating common pediatric MH conditions (e.g., anxiety and ADHD) through training, consultation, and registry review (60). An adult integrated care program focusing on improving the capacity of medical providers to care for the MH care needs for adults with HIV in Ethiopia found that a feasible and effective intervention supported by a multidisciplinary team could support generalists, but that systems challenges could jeopardize the sustainability of such efforts (61). Future growth opportunities may include leveraging technology and access to a broader range of experts across the world to expand the utilization of Extension for Community Healthcare Outcomes (ECHO)—style or other forms of ongoing tele-mentoring and training, to establish hub-and-spoke models that can increase access to child MH care by increasing primary care providers' confidence and competence (62,63). Utilization

of peer support, family support, development of stepped-care algorithms, the availability of brief psychotherapies, and addressing social determinants of health at higher levels of government are additional, important strategies in LAMIC.

Conclusions

There has been a sea change in pediatric practice over the last 30 years with a precipitous drop in "itis-s" and an enormous increase in the numbers of children with MH concerns. Although many leaders have urged changes over the past two decades, there has been little change in pediatric training in MH and little attention is paid to child mental health in family physician residencies. A major thrust to fill this gap has been integrated care. There are several levels of integrated care, including coordinated, collocated, and collaborative care programs. Each model has strengths and weaknesses. The research base for collaborative care programs with adult patients, particularly with depression, is strongest. For children the research base is growing but more limited. There are several notable larger scale collaborative care programs that have been successfully established although there are many barriers to implementation exist. The most widespread programs in pediatrics in the US are coordinated programs, which are easier to implement but have less research support. These programs have been successful in improving access to care but investigation of patient level outcomes are not supported by the service grants that fund these programs. These programs have clearly struck a chord with PPCCs and CAPs and should continue for the foreseeable future, until systems changes, especially in payment, make collaborative care models more widely feasible to implement. LAMIC can benefit from implementation of a broad range of integrated care approaches and this is beginning to occur around the world.

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Footnote

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