Integration and Embedded Behavioral Health Care in Pediatrics

Emily F. Muther, PhD; Heather Adams, DO; Bethany Ashby, PsyD; Sally Tarbell, PhD

Division of Child and Adolescent Psychiatry, Department of Psychiatry, University of Colorado School of Medicine
Pediatric Mental Health Institute, Children’s Hospital Colorado

Introduction

Over the past 30 years there has been an increasing presence of behavioral health services integrated into pediatric primary care and subspecialty clinics. While the range of pediatric conditions/clinics where mental health professionals practice is broad, the largest evidence base for the integration of behavioral health is in the treatment of children with chronic pain, hematological-oncological disorders, and diabetes. However, the research base is expanding to include conditions such as asthma, obesity, sleep disorders, and interventions in pediatric primary care. Behavioral health intervention can be organized around children with a specific medical diagnosis, symptom management, or crosscutting issues such as adherence. While initial integration of mental health in pediatric care focused on specialty pediatrics, within the past 10 years there has been an increased recognition of the benefits of providing behavioral/developmental screening and mental health care in the primary care setting. One common thread through all of these settings is the participation of the behavioral health clinician in a multidisciplinary team that includes not only pediatric medical practitioners, but also a variety of allied health professionals. It is beyond the scope of this article to exhaustively review the literature on integrated mental health care in pediatrics as the field now encompasses a very broad range of pediatric conditions; instead, the article will highlight areas of integrated care that represent the broader range of services provided. In particular, behavioral health in pediatric primary care, pediatric chronic pain, Type I Diabetes, and obesity will be reviewed.

Behavioral Health in Pediatric Primary Care

Pediatric primary care (PPC) provides an optimal setting for the practice of integrated behavioral health services. Pediatric primary care settings provide continuous and comprehensive medical services that are readily accessible to the vast majority of children in the United States and their families. These settings are ideally suited to promote optimal development and well-being through the provision of expanded services that address parental concerns, developmental tasks, psychosocial factors, and behavioral health issues in the context of trusting relationships with familiar providers. Behavioral health clinicians integrated into PPC are able to promote the health and well-being of children and families in a manner directly aligned with the mandates and guidelines of the practice of primary care. According to the American Academy of Pediatrics (AAP) and the Centers for Disease Control, there are approximately 34,000,000 routine infant/child well-child checks per year in PPC in the United States for patients from birth to 22 years of age, with approximately 121,000,000 visits for children under 15 years of age. Pediatric primary care is often the only available entry point to services for vulnerable children and their families.

Although the American Academy of Pediatrics and Bright Futures provide systematic guidelines and outline methods for comprehensive surveillance and screening during well-child checks, most pediatric practices and providers are overwhelmed by the complex risk factors presented during routine visits lasting an average of 18 minutes, and may be reluctant to solicit information about behavioral and psychosocial matters because they feel unable to
adequately address them. Therefore, children experiencing significant risk factors that impact development and family functioning remain unidentified. Even when risk or early disturbance is identified, families often have difficulty accessing necessary community resources.

Behavioral health disorders and patients and families with environmental risk factors often present first to PPC before accessing services through the mental health system. PPC clinicians play an important role in screening for behavioral and developmental conditions, and providing early and less intensive interventions. With the help of integrated behavioral health clinicians, primary care providers have the capacity to identify and manage emotional conditions early on, when there is a greater likelihood they can be prevented or ameliorated. Data have clearly demonstrated that integrating mental health care into primary health care leads to better health outcomes and substantial cost savings.

More than 20% of children and adolescents in the U.S. have a diagnosable mental health problem, and only approximately 20% of those receive adequate treatment. Although there are often access issues and difficulties navigating complex mental health systems, most children do receive pediatric primary medical care. Therefore, screening, assessment, and interventions embedded within PPC are clearly indicated, and have been demonstrated to be effective. The American Academy of Child and Adolescent Psychiatry and the American Academy of Pediatrics have both recognized the significant need for earlier detection and prevention of mental illness in children, as well as improved ability of primary care physicians to initiate treatment. Statistics indicate that 15%-25% of pediatric patients have significant psychopathology, functional impairment, and/or psychiatric comorbidity. Additionally, 18% of patients meet full criteria and 14% meet sub threshold criteria for mental health diagnoses. Approximately 75% of children with psychiatric disturbances are seen in PPC, and 50% of all PPC visits involve concerns about behavioral, psychosocial, or emotional concerns.

**Assessment Methods**

The American Academy of Pediatrics Bright Futures program emphasizes frequent mental health screening to begin the process of identifying children who may need mental health resources and referrals. Assessment in PPC can range from brief, informal assessments that involve record/case review with a physician to more extended, formal assessment. Clinical consultation, behavioral observation, and clinical assessment performed by a mental health clinician are often performed in the context of PPC, when an identified concern has been reported. Research has shown that tools such as the Pediatric Symptom Checklist (PSC) can be used for routine use in a PPC setting as well as combined with other assessment methods to create an integrated approach to assessing and treating behavioral and physical health in a pediatric system of care.

Assessment in PPC can serve a number of purposes, including screening, diagnostic assessment and clarification, treatment planning, determining effectiveness of treatment (eg, medication or behavioral intervention), and identifying barriers to treatment. Screening in PPC is a fundamental intervention that facilitates prevention, increases anticipatory guidance, and creates an opportunity to assess risk factors and promote well-being and positive functioning. Screening is defined as a brief, formal, standardized evaluation, for the early identification of patients with unsuspected deviations from normal.

There are several types of screening interventions indicated for use within PPC.

**Developmental screening.** To improve the early identification and treatment of children with developmental disability, the American Academy of Pediatrics (AAP) recommends that all infants and young children be screened for developmental delays in the context of PPC. Furthermore, the AAP recommends performing developmental surveillance at every well-child visit, and if developmental concerns are raised by the parent or provider during surveillance. Select screening measures that are brief, accurate, and easy to administer and score are available to assist primary care providers in the early detection of developmental and behavioral disorders. There are several developmental screening tests that use information provided by parents or direct observation of providers. The Ages and Stages Questionnaires (ASQ, formerly the Infant Monitoring System) is one of the most widely used tools to
Integrated and Embedded Behavioral Health Care in Pediatrics

screen development in children from 4 to 60 months\textsuperscript{13} on 5 domains: communication, gross motor, fine motor, problem solving, and personal-social.

*Pregnancy-related depression screening.* There has been debate about whether or not screening for pregnancy-related depression in mothers belongs in PPC.\textsuperscript{14} Bright Futures for Mental Health encourages pediatric primary care providers to inquire about depressive symptoms and consider formal screening for pregnancy-related depression using a validated scale.\textsuperscript{14,15} Research indicates that pediatric primary care offices can readily identify pregnancy-related depression and related concerns, and make appropriate referrals to local mental health providers.\textsuperscript{16} When symptoms are identified, recommendations include discussing the safety of mother and baby, referring the mother to a mental health provider, scheduling more frequent pediatric visits, and using phone contacts between visits for ongoing monitoring.\textsuperscript{14}

**Interventions in PPC**

Behavioral health clinicians in PPC engage in activities that “improve the health-related quality of life of children and their families.”\textsuperscript{17} Such activities have been shown to be effective, sustainable, and directly related to improving health and well-being.\textsuperscript{18} These activities include: providing anticipatory guidance during routine well-child visits; screening; early identification and referral related to developmental and behavioral issues; providing initial assessment and treatment for issues that could lead to significant impairment if left untreated; and triaging, referring to, and coordinating care with community resources when higher levels of care are necessary.\textsuperscript{3} Behavioral health clinicians in PPC help improve adherence, promote healthy behaviors and reduce behaviors that increase health risks, and improve communication between healthcare providers and the patients and families they serve.\textsuperscript{17}

Attempts to deliver integrated mental health treatment in PPC have shown promise in randomized trials.\textsuperscript{19-21} A study of an internet-based psychoeducation intervention targeting patients with behavioral problems has shown to be effective in a PPC setting.\textsuperscript{22} Another study of an on-site family intervention for children with behavior problems has also been supported as an effective intervention in PPC.\textsuperscript{23} Additionally, studies have found an increase in family compliance and satisfaction with services delivered by an on-site nurse clinician within a collaborative mental health team in a PPC practice.\textsuperscript{24,25} There have been 2 studies showing modest effects at reducing depression in adolescents through an on-site Internet-based intervention in PPC.\textsuperscript{25,26}

An on-site modular intervention within PPC aimed at improving access to mental health services and outcomes for children with behavioral problems demonstrated an increased likelihood that patients received mental health services, reported fewer barriers to and more satisfaction with services, and showed greater improvements on outcomes related to behavioral disorders at 1-year follow up, compared to enhanced usual care within PPC.\textsuperscript{20} This intervention included approximately 6 sessions with a nurse for training in CBT skills, and as needed, 2-4 booster sessions to address emergent issues or promote maintenance of the parenting skills taught to these families. This intervention was compared to, and shown to be more efficacious than, enhanced usual care within PPC, which included a referral to an off-site mental health provider.\textsuperscript{20}

The Services for Kids in Primary-care (SKIP) treatment research program (www.skipprogram.org) integrates personalized behavioral health services in PPC settings and has produced impressive results related to the efficacy of integrated behavioral health programs in PPC.\textsuperscript{20,27} The feasibility and clinical benefits of doctor office collaborative care (DOCC) has been shown to be effective in addressing behavioral problems and supporting the integration of behavioral and mental health services in PPC.\textsuperscript{28} Significant improvements in behavioral and emotional problems were found for pediatric patients who received psychoeducation, brief modules of skills training in CBT, and care coordination by behavioral health clinicians or trained nurses embedded within PPC as compared to pediatric providers providing the parent with psychoeducation about the child’s symptoms, clinical recommendations, and up to 3 referral options.\textsuperscript{28}

**Recommendations**

The well-understood barriers to accessing specialty mental health services along with the growing significance of untreated mental health problems in children and adolescents have expanded the need for PPC to better identify and manage behavioral health. While substantial barriers exist in creating sustainable behavioral health programs in PPC, the evidence
clearly highlights the importance of integrated mental health programs for children and adolescents in their medical home. Better advocacy is needed to address the significant challenges surrounding reimbursement for behavioral health services in primary care, and to ensure that health and behavior codes are (1) routinely used by behavioral health clinicians to document the services provided in PPC, and (2) universally covered benefits in pediatric health insurance plans. Additional exploration and use of innovative funding mechanisms could better sustain and support behavioral health billing in PPC.

Additional research efforts and funding opportunities are needed to assess the costs and benefits of integrated models in PPC to determine the most effective and efficient approach to services. While programs such as SKIP20,27 have demonstrated efficacy in implementing a collaborative care model of intervention for the treatment of externalizing childhood behavioral health disorders, it is recommended that additional evidence-based programs be developed to address a broad range of behavioral health disorders to test the feasibility and sustainability of PPC-specific interventions to treat pediatric mental health disorders in PPC.

Behavioral Health in the Management of Pediatric Chronic Pain

It is remarkable that there is now an extensive evidence base for the behavioral management of pediatric chronic pain, given that as recently as the mid-1980’s there were still questions within the medical literature as to whether infants and children could feel pain, due to the immaturity of their central nervous system. After pioneering research in anesthesiology and pediatrics demonstrated unequivocally that infants and children do feel pain and that the practice of not treating pain could lead to increased morbidity and even mortality in children, the stage was set for the development of the field of pediatric pain research and treatment. Today there is a strong evidence base for cognitive behavioral therapy (CBT) interventions in the management of chronic pediatric pain.

The pediatric chronic pain literature has focused on children aged 7-18 years. The prevalence of chronic pain in children varies according to the medical condition, with estimates ranging from 6%-18% for children with tension type or migraine headaches, 13% for abdominal pain in children and 17% in adolescents, and 23%-45% for musculoskeletal pain, with a higher prevalence in adolescents and in females. Disease or treatment-related pain has a significantly higher prevalence, ranging from 29% with phantom limbs to 88% in irritable bowel syndrome.29 The most common pediatric chronic pain conditions are headache, abdominal pain, musculoskeletal pain, and fibromyalgia.30 Pain-related disability increases with age, and there is a gender difference that emerges in adolescence, with more girls than boys reporting pain-related functional disability.31

Assessment Methods

Assessment of chronic pain in childhood starts with a biopsychosocial perspective to take into account the multiple factors that can influence the child’s pain experience and the pathways by which they exert these effects. Several developmentally sensitive, validated instruments are now available to measure the sensory, affective, behavioral, and interpersonal/social aspects of children’s pain.32 Thorough baseline and ongoing assessment is essential for guiding interventions for chronic pain and evaluating the child’s response to treatment. Representative assessment methods are detailed below.

Clinical interviews and comprehensive pain assessment questionnaires. The Children’s Comprehensive Pain Questionnaire (CCPQ)33 and the Varni-Thompson Pediatric Pain Questionnaire34 are interviews that separately assess the child’s and parents’ experience of the child’s pain problems with open-ended questions, checklists, and quantitative pain-rating scales. The well-documented comorbidity between pediatric chronic pain and psychiatric disorders, particularly internalizing disorders such as depression and anxiety, obligate the clinician to screen for these disorders along with pain-related fears and avoidance behaviors.35-41 Instruments such as the Pain-Anxiety Symptoms Scale (PASS) use a comprehensive approach to assessing pain.42,43

Coping. The Pain Coping Questionnaire (PCQ),44 Pain Response Inventory (PRI),45 Pediatric Pain Coping Inventory (PedsQL),46 Pain Catastrophizing Scale for Children (PCS-C),47 and the Response to Stress Questionnaire (RSQ)48 assess pain-specific coping strategies. Researchers have also begun to identify subgroups of pediatric chronic pain patients based upon
copied profiles to better target treatment to individual characteristics.49,50

**Functional Impairment.** The Pediatric Migraine Disability Scale (PedMIDAS) assesses functional impairment associated with headache.51 The Child Activity Limitations Interview (CALI)52 assesses the impact of recurrent pain on children’s daily activities as a way to identify appropriate targets for treatment. Additionally, the Functional Disability Inventory (FDI)53 and The PedsQL Generic Core Scales54 assess the impact of pain on child functioning and health-related quality of life respectively. The Quality of Life Pain-Youth (QLP-Y)55 was developed to address quality of life issues particular to chronic pain.

**Behavioral observations and symptom diaries.** Behavioral observation scales56 provide in vivo information on pain-specific behaviors, while electronic diaries have been shown to be feasible and result in greater adherence and accuracy in recording as compared to traditional paper diaries in children with recurrent pain.57,58

**Evidenced Based/Informed Treatments**

Behavioral pain interventions are typically delivered within the context of a multidisciplinary team that can include physicians, nurses, and physical and occupational therapists, along with psychologists or mental health providers. Importantly, chronic pain treatment programs typically require behavioral health assessment and treatment, given the social and emotional impact of chronic pain on the child and the family as a whole. A rehabilitative approach that shifts the focus from the narrow goal of pain reduction to decreasing pain-related emotional and behavioral disability to improve the child’s functional status characterizes the course of most chronic pain treatment programs for children.

Research on the use of psychological therapies is limited primarily to clinical trials in children with headache.59 In a meta-analysis conducted to evaluate the efficacy of behavioral intervention for pediatric chronic pain, Eccleston and colleagues concluded, “There is strong evidence that psychological treatment, primarily relaxation and cognitive behavioural therapy, are highly effective in reducing the severity and frequency of chronic pain in children and adolescents.”59

Psychological treatments have been found to improve pain in for children with sickle cell disease,60-62 recurrent abdominal pain,63-66 complex regional pain syndrome, Type I,67 musculoskeletal pain,58,69 and juvenile primary fibromyalgia syndrome.70,71 A recent meta-analysis found a large positive effect for psychological intervention on pain reduction post-treatment and upon longer-term follow-up with small and non-significant effects found for disability and emotional functioning.72 Acceptance and Commitment therapy (ACT) has been found to be a promising treatment for adolescents with chronic pain.73

There is growing acknowledgment of the parents’ crucial role in successful rehabilitation of youth with chronic pain, and thus treatments are increasingly involving parents as active partners in their child’s treatment.65,74-77

There is evidence to support the use of single behavioral treatment modalities in the treatment of pediatric chronic pain, as in the use of thermal biofeedback and relaxation for recurrent pediatric headache.78 Most treatment programs include a diverse array of techniques that treat chronic pain by modifying children’s cognitive, affective, and sensory experience of pain, their behavior in response to pain, and environmental and social factors that influence the child’s pain experience. Techniques to alter the sensory aspects of chronic pain can include relaxation training, biofeedback, imagery, and hypnosis.

Few component analyses have been conducted to determine which psychological therapies may be most essential in management of pediatric chronic pain. Evaluation of specific behavioral components could provide a key evidence base for what the most active components are in multicomponent interventions, and inform the tailoring of interventions to the individual patient.

While the research to date has focused on improved pain control as a primary outcome of treatment, studies are underway to examine the impact of treatment on psychiatric comorbidity and functional status. Complementary therapies such as occupational and physical therapies, massage, yoga, and acupuncture are increasingly available to children seen in chronic pain clinics, but there is limited literature to document the efficacy of these treatments in pediatric patients.79

**Treatment Delivery.** Several methods for the delivery
of psychological interventions for recurrent or chronic pain in children have been shown to be effective, including those that involve intensive inpatient \textsuperscript{74,80} or outpatient treatment,\textsuperscript{66,73} those that are self-administered,\textsuperscript{81} school-based,\textsuperscript{82,83} Internet-based,\textsuperscript{84} CD-ROM based,\textsuperscript{85} and those that involve minimal clinic contact with home-based practice.\textsuperscript{86,87} The variety of methods for the delivery of these interventions offer opportunities to reach a broad population of children with chronic pain, thus increasing the potential to reach many more children than can be treated in specialized pediatric pain treatment centers.

**Recommendations**

Behavioral health is integrated into the Integrative Headache Clinic in Neurology at the Children’s Hospital Colorado (CHCO), where children receive a multidisciplinary assessment at baseline. However, there are insufficient resources for ongoing behavioral health treatment after the initial assessment, causing a disconnect in the biopsychosocial approach to treating patients. The anesthesia chronic pain program has psychologists; however, behavioral treatment is co-located but not integrated with other health care providers.

One important recommendation involves the consideration of providing formalized training in pain-coping skills for conditions known to be associated with recurrent or chronic pain. These include headache, inflammatory bowel disease, juvenile idiopathic arthritis/juvenile rheumatoid arthritis, and functional GI disorders. Additional recommendations include the use of standard assessments for psychiatric comorbidities and the development of interdisciplinary trans-diagnostic skills groups for children with recurrent or chronic pain in addition to E-health options, including internet and app-based interventions.

**Behavioral Health in the Management of Pediatric Type 1 Diabetes Mellitus**

Over 215,000 U.S. residents younger than 20 years old have type 1 (T1DM) or type 2 diabetes. This represents 0.26% of all people in this age group. During 2002–2005, 15,600 youth were newly diagnosed with T1DM annually, and 3,600 youth were newly diagnosed with type 2 diabetes annually. The prevalence of T1DM in Americans under age 20 rose by 23% between 2001 and 2009.\textsuperscript{88}

Optimal glycemic control of hemoglobin A1c (HgbA1c) between 6% and 8% for adolescents is used to ensure current health and reduce the risk of future microvascular and macrovascular complications such as heart disease, nephropathy, retinopathy, and neuropathy.\textsuperscript{95} Multiple studies demonstrate that young adulthood is the period of poorest glycemic control, with mean HgbA1c level peaking in late adolescence. Average result for HgbA1c in one study was 11.1% at 18-19 years of age.\textsuperscript{89} Glycemic control often deteriorates during adolescence\textsuperscript{90} such that by 20 to 29 years old, mortality is increased 3-fold in diabetic men and 6-fold in diabetic women compared with the general population.\textsuperscript{91}

Acute complications are the major cause for mortality in this age group, with 68% of diabetes-related deaths being certified as due to hypoglycemia and ketoacidosis.\textsuperscript{92} Even small changes in insulin control can have large benefits to health. One percentage point drop in HgbA1c (eg, 9.0%–8.0%) is associated with a 40% risk reduction of developing retinopathy.\textsuperscript{93} Coinciding with poor glycemic control is a concomitant rise in mental health issues. During the period of 17-25 years of age, psychiatric disorders in patients with diabetes needing insulin management increased from 16%-29% and predicted recurrent admission with diabetic ketoacidosis.\textsuperscript{94} This leads to concerns for how to manage patients with both high-risk medications and high-risk mental health disorders.

Adolescents living with T1DM must learn to cope with the demands of adhering to a lifelong medical regimen, which, in turn, may impact psychological well-being and reduce the likelihood of optimal treatment adherence.\textsuperscript{95} Behavioral problems resulting in poor treatment adherence include greater youth responsibility for self-care that in turn predicts poorer self-care behaviors, less frequent exercise, less frequent blood glucose monitoring, increasing behavioral problems, poor communication and high levels of conflict within the family, and poor social skills and coping abilities.\textsuperscript{96-98} The most common referrals for psychological/behavioral intervention include problems with treatment adherence, social concerns, and diabetes-related anxiety.\textsuperscript{95}

Adolescents diagnosed with T1DM have a 2 to 3-fold increased risk (22.8%) for depression compared to healthy peers.\textsuperscript{99} An increase in general anxiety and illness-specific fears is also common.\textsuperscript{100} Depressive symptomology in adolescents with T1DM is predic-
tive of less frequent blood glucose monitoring and increases in HgbA1c by 0.5% (8.5%-9.0%) for every 5 points increase on Children’s Depression Inventory.99 Anxious symptomatology is also associated with higher HgbA1c levels and less frequent blood glucose monitoring.100 In addition to the high rates of comorbid anxiety and depression, eating disorders are common psychological problems for adolescents with T1DM.101 Eating disorders are associated with poor glycemic control. An estimated 10% of adolescent girls with T1DM may meet criteria for an eating disorder, twice the rate for girls without diabetes.102

All of these impairments, plus the added burden of functioning with a chronic medical illness, results in overall decreased quality of life (QOL), measured by the PedsQL, as well as impaired peer, school, and family functioning.103 Interventions that improve psychological functioning and diabetes-related behaviors are associated with optimal glycemic control. Toward that end, an integrated care model of embedding psychologists within an urban pediatric endocrinology clinic has been shown to improve medical outcomes of adolescents with T1DM.103

**Assessment Methods**

Many studies have demonstrated improvements in glycemic control and treatment adherence for youth with diabetes.104-107 Adherence can be measured with: (1) HgbA1C, which demonstrates a 3-month measurement of glycemic control; and (2) Diabetes Self-Management Profile, a 24-item structured interview that yields an estimate of overall treatment adherence over 3 months.107

Resultant changes in quality of life and affiliated mental health issues are also a high burden in this population. These issues can be assessed using a health-related quality of life scale such as the Pediatric Quality of Life Inventory (PedsQL), a modular instrument designed to measure health-related quality of life (HRQOL) in children and adolescents aged 2-18 years; a depression scale such as the Children’s Depression Inventory (CDI), which evaluates the presence and severity of specific depressive symptoms in youth and the Revised Children’s Anxiety and Depression Scale (RCADS); and the Spence and SCARED scales for self and parent report of anxiety symptoms. The RCADS, Spence, and SCARED scales are quickly and easily administered, and their availability for use at no cost facilitates the assessment of anxiety and depressive symptoms during medical visits.108

Access and utilization of psychological services are an ongoing difficulty in various populations of at risk youth. Among adolescents referred to psychology services from medical practices, 66% initiated treatment when services were offered in clinic, whereas only 2.6% followed through with the referral when it was located off-site.109 This study highlights potential improvement in care for medical and psychiatric symptoms when care can be accessed in the same clinic.

**Evidence-Based Interventions**

Interventions have targeted treatment adherence and self-management, family dynamics, social functioning, coping skills, and diabetes-specific anxiety management.103

Trials with education directed at coping skills training reported lower impact of diabetes, better coping with diabetes, better diabetes self-efficacy, fewer depressive symptoms, and less parental control.110 Psychological interventions of various theoretical orientations have improved aspects of self-care in adolescents with T1DM. Examples include cognitive behavior therapy (CBT),111 behavioral family systems therapy (BFST),95,107 family systems theory,112 multi-systemic therapy (MST),113 and coping skills for youth with T1DM.114

In a family systems group intervention, perceptions of diabetes, estimates of youngsters’ self-care, family functioning, and more positive perceptions of being a teenager with diabetes were found.112 Adolescents demonstrated clinically significant improvements in HgbA1c that were maintained at 6-month follow up. Parent reports suggested that adolescents in the intervention groups improved their diabetes care. Findings support the use of multifamily groups plus parent simulation of diabetes as an intervention strategy for adolescents with diabetes.112

Studies using Multi Systemic Therapy (MST) suggest it has the potential to decrease inpatient medical admissions among adolescents with poorly-controlled T1DM.113 Revised Behavioral Family Systems Therapy (BFST) interventions show enhanced impact on diabetes outcomes compared to previous BFST interventions.95,107 The revisions included required targeting of diabetes-specific behavioral problems, extension
of treatment from 3 to 6 months, training in behavioral contracting techniques for all families, a 1-week parental simulation of living with T1DM, and optional extension of therapeutic activities to other extra-familial social environments affecting the child’s diabetes management. A statistically-significant reduction of up to 1% in HgbA1C was seen when compared to the control group after 6-18 months in BFST-D.107

Multi-component interventions that address the emotional, social, and family processes associated with being an adolescent with T1DM can have more robust effects on HgbA1c than a single-point intervention like increase in blood glucose monitoring frequency.115 A coping skills training program produced statistically significant improvement in HgbA1c, medical and diabetes self-efficacy, and quality of life. This program of 6 small group sessions and monthly follow up help youth cope with their lives in the context of diabetes management. Skills include social problem solving, cognitive behavior modification, and conflict resolution.114

An at-risk population of adolescents with T1DM who engaged in pediatric psychology treatment, which included incorporating the family into the care of the patient, behavioral aspects of their medical management, and improving cognitive processing for the patient and family that may impact overall psychological health, experienced significant reductions in HgbA1c over time compared to no treatment and control groups. The average number of sessions and duration of treatment for adolescents and families was 8.28 sessions over a 9-month period.103 These studies show that behavioral interventions can have real impact on medical outcomes in children and adolescents with T1DM.

Recommendations
Continued parental supervision of adolescents, along with monitoring diabetes knowledge and efficacy, may help optimize transfer of diabetes care from parents to youth. Behavior problems warrant immediate attention because of their direct and adverse relation to metabolic control.96 Results suggest that depressive symptoms are important predictors of HgbA1c change by themselves, as well as when considered with adherence to blood glucose monitoring. Screen- ing for depressive symptoms, and expanding and developing prevention and intervention strategies put adolescents with T1DM in the best position for optimal glycemic control.99

The International Society of Pediatric and Adolescent Diabetes Consensus Guidelines states, “Psychological factors are the most important influences affecting the care and management of diabetes.”116 Social workers and psychologists should be part of the interdisciplinary health care team. Overt psychological problems in young persons or family members should receive support from the diabetes care team and expert attention from mental health professionals. The diabetes care team should receive training in the recognition, identification, and provision of information and counseling on psychosocial problems related to diabetes.

Psychological interventions can improve glycemic control for adolescents with T1DM. Although individual CBT therapies are more common, family therapies appear more effective for adolescents.117 Across treatment modalities, the inclusion of psychological intervention as a component of pediatric diabetes care can improve individual and family adjustment and may increase treatment adherence and glycemic control.103

Embedding psychologists within the pediatric endocrinology practice, as opposed to referring to an outside mental health provider, is one strategy used to facilitate the provision of interdisciplinary care, increase access to and utilization of services, and improve patient communication among providers. This model appears to be the most effective at engaging adolescents and families. Psychological services can be effectively embedded in a pediatric endocrinology clinic to offer an accessible and widely-utilized service that results in meaningful reductions in HgbA1c and a reduction in long-term microvascular complication risk.103

Behavioral Health in the Management of Pediatric Obesity
The incidence and prevalence of childhood obesity has increased significantly since the 1980s, and the average overweight child today is more overweight than the average child of 20 years ago.118,119 Approximately 15% of children and adolescents between ages 6-9 are obese, and 10% of children between 2-6 years of age are obese.118 There are significant differences in childhood obesity among racial and ethnic groups.
More than 23% of African American and Latino children are obese, with African American girls having the highest rates of obesity.\(^\text{118}\)

Certain psychosocial factors put children at a higher risk of obesity. These factors include abuse, neglect, and having a nonsupportive family. Children who experience neglect have a 9 times greater risk of becoming obese.\(^\text{120}\) Obese children and adolescents have higher rates of low self-esteem and higher rates of negative body image than their same age peers.\(^\text{121-127}\) In terms of psychiatric comorbidity, obese children who present for mental health treatment have higher rates of depression, anxiety, somatoform, and eating disorders.\(^\text{128-131}\) In adulthood, childhood obesity is associated with fewer years of education and increased poverty.\(^\text{132,133}\)

There is an array of health complications associated with pediatric obesity. In adolescents, obesity is associated with high blood pressure and elevated lipids, which increases the risk of disease and death.\(^\text{134}\) Compared to adults who had normal weight as children, adults who were obese as children have twice the rates of heart disease and high blood pressure and 3 times the rate of diabetes.\(^\text{135}\) Further, being obese as an adolescent is a better predictor of adult mortality than being obese as an adult.\(^\text{136}\) The rate of type 2 diabetes in children increased 10 times from 1982-1992, with over 90% of those children having a BMI greater than the 90th percentile.\(^\text{137}\) Over 90% of obese children have some kind of sleep disorder, typically sleep apnea.\(^\text{137}\)

**Assessment Methods**

Obesity is determined by body mass index (BMI), where children with BMIs greater than the 95th percentile are considered obese,\(^\text{138}\) and those with BMIs between the 85th and 95th percentile considered overweight and high risk. Because of well-documented health risks associated with obesity, a complete physical is warranted to rule out any health complications or contributing factors.

There are no psychological assessment measures specifically recommended for pediatric obesity. Therefore, clinical interviews with parents and child, as well as standard measures for depression (Child Depression Inventory, and Child Behavior Checklist), anxiety (State-Trait Anxiety Inventory), and self-esteem (Perceived Competence Scale for Children) are recommended.\(^\text{137}\) The Children’s Eating Behavior Inventory and the Children’s Eating Attitude Test can also be used to determine readiness to change, or readiness for referral to a weight management clinic/program.\(^\text{137}\)

**Evidenced-Based/Informed Interventions**

Unlike the treatment of adult obesity, the primary goal for treating pediatric obesity is improving eating habits and increasing physical activity, not weight loss.\(^\text{134}\) Although the models are heterogeneous, behavioral interventions are considered first-line treatments for pediatric obesity. They have demonstrated the greatest efficacy, with medium to high intensity level interventions having the most impact.\(^\text{139}\) In addition to changes in diet and activity level, families are typically included in treatment, especially for younger or school-aged children.\(^\text{105,137}\) Specific intervention strategies include improving problem-solving skills, goal setting, decreasing exposure and access to unhealthy foods, and relapse prevention.\(^\text{139-141}\) Evidence supports the use of weight-loss medication combined with behavioral treatment in older adolescents who meet criteria for class II obesity.\(^\text{140}\)

**Recommendations**

Treatment for pediatric obesity typically occurs in specialty obesity clinics with multidisciplinary teams that often include social workers and/or psychologists in addition to a variety of other medical providers.\(^\text{140}\) Formal guidelines and policies should exist that reflect the importance of multidisciplinary care for pediatric obesity and mandate the presence of behavioral health providers as part of care teams. Additional efforts could focus on implementing routine psychosocial screeners to identify risk factors and comorbidities that can be treated to improve obesity and adherence to obesity-related interventions.

Two behavioral treatments for pediatric obesity highlighted in recent review articles have been recommended for use in primary care settings due to the brief intervention time required (about 4 hours total), and use of support staff for mailings and phone call counseling.\(^\text{142,143,140}\) Such interventions should be evaluated for efficacy, feasibility, sustainability, and implementation into various types of pediatric primary care clinics (eg, community-based, academic medicine, federally qualified health centers, etc). Collaborative efforts should focus on training medical providers to
feel more confident in knowing when to appropriately assess and treat pediatric obesity within primary care, and when to refer out to subspecialty clinics.

Conclusion

While the range of integrated behavioral health services, from primary care to the most specialized tertiary care, is increasing, the need for such services is endless. One of the biggest challenges to the development of integrated services is the decision making about which services provide measurable benefits to the populations served, and the optimal platforms for delivery. Rational decision making will require service providers to gather data to inform service development and monitor the impact of such services on health outcomes and sustainability. There is preliminary evidence of the acceptability and effectiveness of providing integrated mental health services in primary care, as well as in subspecialty clinics. The early identification and treatment of developmental and psychiatric disorders within the context of the child's medical care, family, and larger social environment provide the opportunity to prevent and manage the long-term health consequences of complex conditions such as diabetes and obesity. The potential for improving the health of children and their families is great; however, to fulfill the promise of integrated services, investment in research and quality improvement efforts are essential to ensure that the treatments aimed to improve health for the child and the family as a whole can be substantiated and supported by health care systems and payers.

References


