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## Screening and support for emotional burdens of youth with type 1 diabetes: Strategies for diabetes care providers

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### Abstract

Multiple sources of burden for youth with type 1 diabetes (T1D) impact key outcomes including quality of life, self-management, and glycemic control. Professional diabetes organizations recommend diabetes care providers screen for psychosocial and behavioral challenges and implement strategies to support youth with T1D. The purpose of this paper is to review the literature and recommend practical strategies medical providers can use for screening and behavioral support for youth with diabetes and their families. As part of their routine medical care, diabetes care providers are well positioned to identify and intervene to address emotional distress related to the burdens of living with diabetes. In collaboration with multidisciplinary team members, including psychologists and mental health professionals, medical providers may be able to successfully implement brief behavioral strategies for screening and providing emotional support.

### Keywords

Diabetes Mellitus; Insulin-Dependent; Emotional Adjustment; Ambulatory Care; Behavioral Medicine

## 4. Introduction

Living with and managing type 1 diabetes (T1D) is intensive, expensive, and relentless. Daily self-management involves frequent blood glucose monitoring and insulin adjustments and administration, as well as consideration of physical activity, nutrition, stress, and illness. Expenses related to T1D management have mounted in recent years, with growing costs and inconsistent insurance coverage for insulin, supplies, and management technologies (1,2). In addition to the medical and financial demands of daily T1D self-management, emotional demands are common and contribute to the overall burden of living with T1D. Multiple

sources of burden for youth with T1D and their families impact key diabetes outcomes including quality of life, self-management, and glycemic control. Thus, there is a need to more effectively and routinely screen for these challenges and support youth with diabetes. Indeed, clinical guidelines from the American Diabetes Association (ADA) and International Society for Pediatric and Adolescent Diabetes (ISPAD) explicitly call for routine assessment and treatment of psychosocial burdens for people with diabetes (3–5).

Diabetes care providers describe facing various family and psychosocial challenges in their work with youth with T1D, including family conflict, diabetes-related distress/burnout, and life stressors impacting diabetes care (6). However, managing these issues may be difficult for some providers: physicians in primary care have reported concerns about their abilities and comfort addressing mental health issues in their practice (7), and many endocrinologists report having limited options for their patients to access mental health professionals, making it more difficult to provide effective diabetes care for their patients with depression and other psychosocial concerns (8).

Thus, the aims of this paper are to: (1) provide a conceptual review of common emotional burdens that frequently arise in pediatric diabetes practice, and (2) describe practical strategies diabetes care providers, including physicians, advance practice providers, educators, dietitians, and other medical providers in diabetes clinics, can use to screen for emotional burdens of T1D and support youth with T1D and their families in their clinical practice.

## 5. Emotional Burdens of Youth with T1D

Symptoms of depression are common among young people with T1D across the globe (9–12). Diabetes-specific stressors are common, including diabetes distress related to the everyday burdens of having and managing T1D (13,14) and fear of hypoglycemia related to worries about the physical and medical sequelae of low blood glucose (15). Depressive symptoms and diabetes distress have consistently demonstrated associations with lower engagement in T1D self-management, poorer glycemic outcomes, and lower quality of life (16,17), and fear of hypoglycemia has mixed associations with diabetes outcomes (15). Interpersonal diabetes-related burdens include stigma (18–20), family conflict (21,22), and insufficient parental involvement in diabetes self-management (23), which have been linked with suboptimal diabetes management and glycemic outcomes (24,25).

Some youth and families are more vulnerable to diabetes-related emotional burdens than others. For example, youth in homes with a larger ratio of children to parents have higher diabetes related conflict (26) and those with single parents have higher youth behavior problems, family conflict, parenting stress, and less parent involvement in diabetes management (27,28). The relationship between single-parent family structure and emotional burden may be confounded by low socioeconomic status (SES) (28), which is associated with higher parenting stress, diabetes-related family conflict, and youth depressive symptoms (26,28,29). Diabetes-related burdens among low SES families are related to greater exposure to stressors and adversity, as well as less access to tangible (e.g., insurance coverage) and psychosocial resources (e.g., self-esteem, optimism, social support) (30–32).

Racial/ethnic minority youth with T1D also experience higher emotional burden than non-Hispanic whites, including higher parenting stress, conflict, behavior problems, and depressive symptoms (26,27,33). Psychosocial contributors to higher emotional burden in minority families include inadequate parental involvement in diabetes management, lower social support, and ineffective coping strategies (27,32).

In the context of these significant burdens, there is growing recognition of the importance of building protective skills (known as “diabetes strengths”) that can help youth overcome the challenges of diabetes and achieve positive diabetes outcomes (34). Strengths including adaptive attitudes and behaviors, both related to diabetes and in general, have demonstrated associations with positive outcomes such as comfort with diabetes management in public (35), and with diabetes quality of life, blood glucose monitoring frequency, and glycemic outcomes (36). Thus, an important role of diabetes care providers is not only to identify and treat sources of burden, but also to identify and support sources of strength.

## 6. Screening

The ADA and ISPAD recommend regular (at diagnosis and annually) screening for psychological concerns related to diabetes health-related quality of life, depressive and anxiety symptoms, diabetes-specific emotional distress, fear of hypoglycemia and hyperglycemia, and disordered eating behaviors/insulin omission (3,4). They also suggest assessment of family factors related to having a child with diabetes, such as family conflict, diabetes-specific communication, parental monitoring of self-management, and responsibility for diabetes tasks, especially for families presenting with significant stress or adjustment concerns, or who present with language or cultural barriers. Diabetes care providers have several options for instruments to use for screening the various aspects of burden for youth with T1D and their families. There are also multiple decisions to make about the protocol for screening, including frequency of screening, method of data collection, and staff responsibility for scoring and responding to scores. Research about best practices for screening is limited, yet lessons may be learned from the initial studies in this area.

### When to Screen

Few studies have been published on standardized psychosocial screening at diagnosis of T1D. Schwartz and colleagues (37) reported on an interview-based screening protocol with parents during the inpatient admission at diagnosis that was found to be feasible and acceptable. Specific risk factors including public insurance, single-parent homes, lower parental education, and family conflict predicted future diabetes-related hospitalizations. More work is needed to further develop and evaluate screening tools and strategies for use at the stressful period around diagnosis. Because routine screening embedded as part of outpatient diabetes follow-up appointments is more common, the remainder of this section focuses on logistical and practical considerations of screening as part of follow-up care.

## Selecting Measures

Most clinics implementing screening protocols have focused on symptoms of depression (38), in part due to recommendations for routine assessment of depressive symptoms in the general adolescent population (39). Others screen for multiple constructs in addition to depressive symptoms, such as anxiety symptoms, general behavior concerns, quality of life, adaptive behaviors/strengths, and family conflict. Because parents' well-being may also be impacted by having a child with T1D (40) and is related to child diabetes outcomes (41), parents also complete screening measures in some clinics (42, Evans, unpublished data). Other issues that might be important to screen for include stressful life events, as youth with more stressors have poorer quality of life, treatment adherence, and glycemic outcomes (43).

After deciding on the constructs to measure in a screening protocol, an important consideration is the selection of instruments to use. For example, Boogerd and colleagues (42) administered validated measures of child behavior concerns and strengths (44,45), quality of life (46) and parenting stress (47) to parents of school-aged children with T1D prior to clinic visits, and providers also rated their patients' psychological functioning. Their results indicated that provider ratings aligned with validated questionnaire scores approximately 50% of the time, were overestimates 40% of the time, and underestimates 10% of the time, highlighting the importance of using validated questionnaires to comprehensively and validly assess emotional health.

With regard to considering psychometric properties in selection of screening instruments, Lavigne and colleagues (48) recommend considering the sensitivity (the percent of people who have the disorder of interest and who screen positive) and specificity (the percent of people who do not have a disorder of interest and who screen negative) of screening instruments. High sensitivity will ensure everyone who needs support receives further evaluation, treatment, and referrals, but measures with high specificity may help to reduce false positives and allocate limited clinical resources to those at highest risk. Sequential screening is one option to integrate both features: individuals who screen high on a highly sensitive measure then complete a second screener with high specificity, and those who score high on both receive further evaluation by a clinician. Given the frequency of low literacy among families at highest risk, screening should include instruments designed for low reading levels (49).

To assist with selecting measures, the ADA published recommendations for validated screening and assessment instruments for use in diabetes care settings (4). Some brief instruments that have been used to assess for depressive symptoms in youth include the 9-item Patient Health Questionnaire (50), the Patient Health Questionnaire for Adolescents (51), the Children's Depression Inventory (CDI) (52), the Center for Epidemiological Studies Depression Scale (53), the Short Mood and Feelings Questionnaire (54), and the PROMIS pediatric depression measures (55). Brief instruments that have been used to assess for anxiety symptoms in youth include the Generalized Anxiety Disorder 7-item scale (56), the Penn State Worry Questionnaire for Children (57), and the PROMIS pediatric anxiety measures (55). Developmental considerations are important in measure selection as well: Table 1 lists the instruments that are used in a comprehensive screening protocol that is in

use at the diabetes clinic at Ann and Robert H. Lurie Children's Hospital of Chicago, with different tools to assess unique issues for children, adolescents, and parents.

In addition to the psychometric properties of various tools, the costs of licensing and administering various instruments can also impact measure selection. Expenses of clinic-based screening programs include purchasing measures and materials or devices for administration and staff time for training, scoring, interpretation, and responding to elevated scores. Given that there is often a practical need to select measures that do not incur a licensing fee, all measures listed above with the exception of the CDI are freely available for use. Selecting brief, straightforward measures may reduce the time spent completing the screeners and the need for extra assistance. Corathers et al. (38) calculated an initial cost of \$4 per screening encounter for licensing the CDI (52), data programming for electronic data collection, and tablets; the cost declined to approximately \$2 per subsequent screening encounter. Their diabetes clinic had the necessary staff (clinical social workers and pediatric psychologists) to administer the screeners and provide further diagnostic follow-up and referrals when necessary; however, for clinics that do not already have these resources, a psychosocial screening program would require additional resources and financial investment. Of note, psychologists in the United States can bill for clinical services including assessment (63), which may help to offset costs in some settings.

### Collecting and Integrating Screening Measures into Care Processes

Several clinics have begun to routinely collect screening measures at clinic visits and share the findings with the care team to facilitate appropriate referrals. For example, Corathers and colleagues' (38) protocol for screening depressive symptoms includes adolescents with T1D completing a questionnaire via electronic survey in the waiting room and providers receiving results and written guidance for responding to elevated scores prior to the clinic visit. This system received positive feedback from patients, parents, and providers, and the investigators successfully screened 96% of eligible youth, demonstrating both acceptability and feasibility. Similarly, at Ann and Robert H. Lurie Children's Hospital of Chicago, children, adolescents, and parents annually complete screening measures via secure web survey system at diabetes appointments. A pediatric psychologist in clinic follows up with anyone with elevated scores and provides referrals for mental health services. Additionally, the diabetes care team receives summaries of screener results to facilitate continuity of care and track progress. In a pilot study with this program, participating families and providers were highly satisfied with the screening protocol and recommended screeners be administered on an annual basis (Evans, unpublished data). As this program is implemented annually, de-identified data from all screened families will be tracked over time to assess longitudinal psychosocial functioning and referrals to mental health services.

The time required for psychological screening is of concern for integration in busy clinics. For clinics that decide to screen for more than one issue, the burden for patients of completing multiple measures, and the burden on clinic staff to administer and score multiple measures, must be considered. Recommendations about increasing efficiency of screening include: being flexible to accommodate a variable number of patients in clinic per day and having patients complete the screeners electronically on a tablet during the check-in

process prior to the medical visit with the provider (38). Additionally, computerized adaptive testing processes that ask a few questions on each topic area (e.g., using PROMIS measures) and automatically administer full screeners for any issues with elevated scores may be useful to increased efficiency and reduce time and burden on families (64).

Another important consideration for clinical integration is responding to caregivers who endorse their own mental health concerns, especially in pediatric clinics and when screening for symptoms of depression and anxiety. Trained mental health providers may conduct an additional assessment, including discussion of the frequency and severity of the endorsed symptoms and recommendations for follow up by an adult mental health provider, including a list of local resources. For example, international guidelines for the treatment of cystic fibrosis recommend regular screening of caregivers in CF clinics, including identifying appropriately trained individuals to determine whether caregiver screener results are clinically significant, conduct a follow up diagnostic assessment, and make a referral to their primary care provider or to a mental health provider for treatment (65).

Successful strategies for screening for emotional burdens in pediatric primary care and other subspecialties may help inform screening practices in T1D. Barriers to screening in pediatric primary care include lack of medical provider training and low confidence to identify emotional burdens, lack of time, long wait-lists for specialists who address emotional burdens, and inadequate reimbursement (66). To address these barriers, national organizations in the United States provide continuing medical education and resources to help primary care providers assess their current screening practices and use accurate billing codes (66). Other strategies include screenings conducted by nurses or master's level clinicians instead of physicians (67,68) and training providers to use patient-centered communication during screening conversations in primary care (69). International recommendations for cystic fibrosis care encourage specialty care team professionals with expertise in psychosocial functioning, such as a licensed clinical social worker, psychologist, or psychiatrist, conduct or oversee screening processes for emotional burdens (65). Despite the potential challenges of implementing and managing psychosocial screening, it is widely acknowledged as valuable; although data are not available from diabetes care providers, research with multidisciplinary cancer providers indicates the widespread appreciation of screening data to guide clinical care (70).

## 7. Interventions

Several behavioral interventions have demonstrated efficacy in improving behavioral, psychological, and glycemic outcomes in youth with T1D (71). The most successful interventions are multicomponent programs, usually delivered by trained behavioral specialists or psychologists in multiple sessions (71–79). While full-scale behavioral intervention approaches are not feasible for most diabetes care providers to deliver during clinical care, common components of these approaches may provide strategies that can be used by members of the diabetes care team in clinical encounters with youth with T1D (Table 2).

## Selecting the Intervention

Some intervention approaches may be especially useful for youth at elevated risk for burden and suboptimal glycemic outcomes, with adaptations to match their needs. For example, approaches that target realistic expectations for youth self-management, focus on effective parent-child communication, and promote appropriate parental involvement in diabetes management may be particularly suitable for single parent families or those with a large ratio of children to parents. Behavioral strategies to teach brief stress management skills, facilitate self-advocacy within the healthcare system, and help families locate community resources may be appropriate for low-SES youth and families. To most effectively reach youth and families at elevated risk, intervention materials and delivery formats should accommodate lower literacy and health literacy skills (49).

## Integrating Interventions into Clinical Practice

**Behavioral Strategies for Diabetes Care Providers:** To successfully manage diabetes and address its emotional burdens, providers must understand and communicate with youth and families about their priorities. Providers and patients may have different priorities for diabetes management and outcomes – for providers the priority may be to optimize glycemic outcomes to minimize the risk of complications later in life, and for youth and families their priority may be quality of life. Discussion and understanding of these different priorities or goals may help diabetes care approaches meet everyone’s needs. For example, Wolpert and Anderson (80) proposed, “the benefits of intensive treatment should be explained in terms of increased personal freedom and the treatment plan should incorporate patients’ goals.” Similarly, the 2017 American Diabetes Association’s Standards of Medical Care for Children and Adolescents (5) called for diabetes care providers to “consider the impact of diabetes on quality of life,” and “in selecting glycemic goals, the long-term health benefits of achieving a lower A1c should be balanced against the risks of hypoglycemia and the developmental burdens of intensive regimens in children and youth.”

One type of diabetes care provider-delivered intervention uses a monitoring and feedback approach in which youth and parent complete measures of an important topic related to the burden of T1D (e.g., quality of life, self-management behaviors) and the provider discusses the results as part of a routine medical encounter. De Wit and colleagues used this approach to assess and support quality of life in adolescents with T1D in The Netherlands (78,81). Youth completed the MIND-Youth Questionnaire (MY-Q) (82), a tool developed for use in clinical care that assesses clinically relevant and actionable domains of quality of life (family, mood, activities, treatment barriers, school). Youth also flagged areas they perceived to be the most problematic, serving as a first screening step incorporated within the overall assessment of quality of life. Psychologists trained diabetes care providers to use the MY-Q scores and flags for a brief, in-clinic discussion about quality of life. This training included education about the importance of addressing quality of life in care, instruction in how to guide families in a brief conversation based on their responses to the measure, and practice using motivational communication and problem-solving techniques to address the quality of life issues that are identified. Strategies for implementation in routine care were also discussed. This program resulted in improvements in psychological well-being, self-esteem,

and satisfaction in care (78), and may have prevented deteriorations in glycemic outcomes (83).

Hilliard and colleagues piloted a clinic-integrated intervention approach focused on youths' positive diabetes-related behaviors and attitudes. Like the De Wit et al approach with quality of life, parents and adolescents completed measures prior to the clinic visit at home or in the waiting room, via secure web survey. In this case, the measures assessed teens' diabetes-related strengths (62) and self-management behaviors (84). Diabetes care providers were given score summaries, and at the start of the visit they provided reinforcement and guided a brief, strengths-based conversation based on youth and parent ratings. Psychologists trained the providers to interpret the score summary and lead the brief discussion about what had been going well recently for the teen and family in relation to T1D. Preliminary data demonstrated feasibility and high satisfaction from all stakeholders including youth, parents, and providers, with improvements reported in teen diabetes strengths, self-management, and provider relationships (85).

Another clinic-based, diabetes care provider-delivered intervention is the "Checking In" approach, developed by Monaghan and colleagues (86). Psychologists on the medical team trained providers to teach families strategies for positive parent-adolescent communication about blood glucose monitoring, and to encourage families to have 3-minute meetings 3 times per week to review blood glucose data and problem-solve related challenges. Diabetes care providers delivered the pilot intervention materials during a routine medical clinic visit and the study team reinforced intervention content through brief text messages or e-mails to the family for the following 12 weeks. Pilot study results indicated family and provider satisfaction and that it was feasible to integrate into a busy pediatric diabetes clinic. There were also promising outcomes related to decreased family conflict, increased blood glucose monitoring, and improved glycemic outcomes (86).

### **Integrating Interventions into Clinical Practice**

**Communication Strategies for Diabetes Care Providers:** For all diabetes care provider-delivered intervention strategies, good communication skills are essential. For example, motivational interviewing (MI) was designed to help providers communicate in a way that prioritizes patient preference and supports autonomy. Across pediatric populations, it has been shown to be moderately effective, especially when youth and parents were both involved (87). MI has begun to be evaluated for use with youth with T1D, though trials are scarce and show mixed results (88). MI seems to be more effective when practiced by mental health specialists (89,90), suggesting that in-depth training may be necessary to use this approach effectively.

Shared decision making (SDM) is a communication tool for providers to partner with patients to make medical decisions based on the best available evidence and the patient's values, preferences, and treatment goals (91). Using SDM, providers outline the advantages and limitations of available treatment options (including making no change) to stimulate discussion and decision making. Although there has been relatively little research in this area, SDM may be well-suited for use with youth with T1D as they and their families navigate changes in responsibility for self-management and encourage youth to participate



in medical decisions. For example, SDM may be used in the process of deciding between insulin injections and pump therapy or continuous glucose monitoring (92). SDM may also be used to set glycemic targets that the diabetes team and family can agree upon and share. In one study, youth with T1D reported being less likely to follow diabetes care providers' recommendations when the provider did not use SDM (93). One of the challenges using SDM with youth is the need to involve parents, and the degree of their involvement should be tailored to meet each youth's developmental level and each family's needs.

Trained diabetes nurses, pediatricians, or other members of the care team can integrate assessment and discussion of topics related to the emotional burden of T1D with youth in routine care. Working with behavioral specialists or mental health professionals, training medical providers to use brief behavioral and communication strategies such as these can last a few hours to one day, should include anyone on the care team who will be involved, and should provide concrete instruction in the materials to be discussed, the strategies to be used, and basic communication techniques to discuss the outcomes in a positive way (81). More research is needed to evaluate the feasibility and sustainability of these approaches and to develop best practices for effectively training diabetes care providers to use behavioral strategies in their routine care of youth with T1D.

### **Integrating Interventions into Clinical Practice**

**Systems-level Changes to Incorporate Behavioral Strategies into Care:** In addition to diabetes care provider-delivered interventions, there is also some preliminary support for systems-level changes in how diabetes care is delivered to youth with T1D. Corathers and colleagues argued, "*Given the complexity of diabetes care, in order to achieve a profound impact on glycemic outcomes and patient experience, there will be a need to have innovative models that embrace systematic transformation at all levels of the health care delivery system*" (94). For example, the shared medical appointment model involves the delivery of care to a small group of people with similar diagnoses or health concerns, and usually includes an interactive group session and a private meeting with the provider for a physical exam. Among adults with a variety of conditions (including T1D), shared medical appointments have been demonstrated to increase patient and provider satisfaction with care, raise clinic efficiency and improve health outcomes (95,96). Initial studies of shared medical appointments with youth with T1D, led by a multidisciplinary team of medical, mental health, and social work providers, reported more diabetes-related education topics were discussed compared to usual clinic care (97) and participants valued the presence and perspectives of other youth with T1D and their families (98).

Care delivery via telemedicine and e-health may also offer new possibilities to support youth with diabetes and their families. Examples include medical and/or behavioral consultations via internet-based video platforms such as Skype (99–101), web-based applications to administer and score psychosocial screeners (102), electronic communication with medical providers between visits via online patient portals to provide continuity of care (103), and delivering efficacious behavioral interventions through the internet to expand reach and dissemination (104,105). As this is a relatively new area, research is needed to study the effectiveness of web-based e-health intervention approaches on a larger scale.

## 8. Conclusions

Whatever the approach to screening or intervention a diabetes care provider uses, effectiveness depends on the level of integration into routine health care (97). Barriers to successful implementation of a new intervention include clinic and institutional organization and communication processes within care teams (98). Making use of existing resources and technologies can help overcome some of the barriers, such as using online platforms for screening measures (38) or coordinating with medical assistant staff to minimize disruption to clinical staff (85). As demonstrated in the diabetes care provider-delivered and clinic-based screening and intervention approaches reviewed, prioritizing brevity and integrating processes with clinical flow can maximize the potential for successful implementation in busy pediatric T1D clinics. Tables 1 and 2 summarize resources and practical strategies diabetes care providers can use to begin to address the emotional burdens of T1D as part of their diabetes practice. When available, consultation with mental health professionals is valuable to assist medical providers in scoring and interpreting screening measures, learning how to implement behavioral strategies, and making decisions about referrals for more in-depth mental health support.

As indicated throughout this manuscript, there are gaps in the behavioral research for youth with T1D and their families that may limit the evidence about implementation of the practical strategies presented. The literature on integrating screening protocols in diabetes clinics is relatively new, leaving much to be learned about the most effective screening protocols and procedures for follow-up. More research is needed to guide the selection of measures, the implementation of models that are maximally efficient, cost-effective, and clinically informative, and use of clinical resources to identify and support patients and families in need of additional emotional or behavioral support both at diagnosis and after. Similarly, while multicomponent behavioral interventions are well-researched, most clinic-integrated approaches for use by medical providers are in the early stages of pilot and feasibility research. Forthcoming outcomes about implementation and impact on diabetes outcomes will be informative for dissemination to practice. Most of the existing work in this area has been conducted in samples primarily consisting of English-speaking, non-Hispanic White youth in two-parent families, limiting applicability to youth and families from other backgrounds. Future research on developing and implementing behavioral strategies tailored to the experiences and needs of more diverse populations is needed.

Management of diabetes is complex and requires understanding of the individual behaviors and needs of youth and their families to achieve optimal clinical and mental health outcomes. This requires a patient-centered care approach that emphasizes supportive communication strategies and promotes engagement and a mutual understanding among the diabetes care provider, youth, and family. Diabetes care providers are well positioned to foster conversation about the burdens of living with T1D with patients and families, and using brief behavioral strategies for screening and emotional support may facilitate this process.

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**Table 1**

Screening measures for children, adolescents, and parents at Lurie Children's Hospital Diabetes Clinic.

<b>Construct</b>	<b>Child</b>	<b>Adolescent</b>	<b>Parent</b>
Depression and anxiety symptoms	PROMIS Computerized Adaptive Testing (CAT) measures (55)	PROMIS CAT measures (55)	PROMIS CAT measures (58)
Disordered eating behaviors	NA	Unpublished survey questions:  - How often do you skip or take less insulin to avoid gaining weight? To lose weight?  - 5 Likert response options: Never to Daily	NA
Diabetes distress	Problem Areas in Diabetes – Child version (59)	Problem Areas in Diabetes – Teen version (14)	Problem Areas in Diabetes – Parent version (59)
Diabetes-related family conflict	Diabetes Family Conflict Scale – Revised (60)	Diabetes Family Conflict Scale – Revised (60)	Diabetes Family Conflict Scale – Revised (60)
Social support	NA	NA	Unpublished survey questions:  - I feel that I have people in my life who support me with my child's diabetes (5 Likert response options: Not at all true to Very true)  - I receive support from the following people in managing my child's diabetes (check all that apply from list of people)
Diabetes strengths	Diabetes Strengths and Resilience – Child (61)	Diabetes Strengths and Resilience – Teen (62)	NA

**Table 2**

Common components of seven efficacious behavioral interventions for youth with T1D (73–79).

Intervention Component	Practice Specifics	Purpose	Case Examples	Possible Provider(s)
<i>Individual monitoring and feedback</i>	<ul style="list-style-type: none"> <li>Assess individual/family’s primary concerns</li> <li>Track target behavior(s)</li> <li>Review tracking data with patient</li> <li>Set goals and monitor progress</li> </ul>	<ul style="list-style-type: none"> <li>Tailors intervention to youth and family’s specific concerns</li> <li>Provides individual feedback based on concrete data</li> </ul>	<p>Ana has high blood glucose in afternoons after school. Family tracks lunchtime blood glucose checks. At next visit, review of meter download identifies patterns: lunch checks complete on weekends, but often missed on school days. Discuss ideas to facilitate completing checks during school lunch hour and track again after implementing plan.</p>	<ul style="list-style-type: none"> <li>Endocrinologist, Physician</li> <li>Nurse Practitioner, Physician Assistant</li> <li>Diabetes Educator</li> <li>Social Worker</li> <li>Psychologist</li> </ul>
<i>Diabetes-related psychosocial education</i>	<ul style="list-style-type: none"> <li>Give information about psychological and behavioral aspects of T1D</li> <li>Provide basic psychosocial recommendations</li> </ul>	<ul style="list-style-type: none"> <li>Normalizes difficulties, and negative feelings related to T1D</li> <li>Provides realistic expectations for youth and parent behavior</li> </ul>	<p>Brian has had diabetes since he was 5 years old and now at age 14 his parents believe he is old enough to take care of it independently. Provide information about adolescent development and competing demands to encourage ongoing parental involvement.</p>	<ul style="list-style-type: none"> <li>Endocrinologist, Physician (with training)</li> <li>Nurse Practitioner, Physician Assistant (with training)</li> <li>Diabetes Educator (with training)</li> <li>Social Worker</li> <li>Psychologist</li> </ul>
<i>Guided problem solving/goal setting</i>	<ul style="list-style-type: none"> <li>Identify major concern</li> <li>Guide patient/family in brainstorming possible solutions</li> <li>Discuss barriers to implementing solution</li> <li>Set goal that is specific, measurable, and achievable.</li> </ul>	<ul style="list-style-type: none"> <li>Teaches skill to systematically consider solutions for challenges that come up with diabetes care</li> </ul>	<p>Carlos often forgets to bolus for snacks after school, especially when out with friends. After considering possible solutions (e.g., eating only low-carb snacks, ask a friend to remind him, setting reminder alarm on phone) he decides to try the phone</p>	<ul style="list-style-type: none"> <li>Endocrinologist, Physician (with training)</li> <li>Nurse Practitioner, Physician Assistant (with training)</li> <li>Diabetes Educator (with training)</li> <li>Social Worker</li> <li>Psychologist</li> </ul>

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Intervention Component	Practice Specifics	Purpose	Case Examples	Possible Provider(s)
			alarm. Check in after 2 weeks to see if reminder made it easier to remember – if not, pick another option to try.	
<i>Enhance support</i>	<ul style="list-style-type: none"> <li>Promoting developmentally appropriate family roles in diabetes management</li> <li>Identifying sources of peer support</li> <li>Teaching communication and conflict management skills</li> </ul>	<ul style="list-style-type: none"> <li>Reduces feelings of stress and isolation</li> <li>Provide assistance with diabetes management tasks</li> </ul>	Dominique is starting college and doesn't know anyone else going there. Her mother is worried about not being there to help with diabetes care. Dominique tells her roommate about T1D and joins a T1D student group on campus, and texts updates to her mom every couple of days.	<ul style="list-style-type: none"> <li>Diabetes Educator (with training)</li> <li>Social Worker</li> <li>Psychologist</li> </ul>
<i>Behavioral management/reinforcement</i>	<ul style="list-style-type: none"> <li>Establish clear expectations for diabetes care behaviors</li> <li>Enforce consequences or provide reinforcement for engaging in behaviors</li> </ul>	<ul style="list-style-type: none"> <li>Enhances motivation for engaging in diabetes care behaviors</li> <li>Recognizes and rewards effort</li> </ul>	6 year-old Matt resists finger checks and pump site changes at night, causing parental stress and delaying bedtime. A new reward system allows Matt to earn 2 extra bedtime stories or 10 extra minutes of screen time for cooperating with checks and site changes.	<ul style="list-style-type: none"> <li>Diabetes Educator (with training)</li> <li>Social Worker</li> <li>Psychologist</li> </ul>
<i>Cognitive behavioral skills</i>	<ul style="list-style-type: none"> <li>Teach cognitive restructuring skills to challenge and replace negative, unhelpful thoughts.</li> <li>Teach relaxation techniques for diabetes-related stressors</li> </ul>	<ul style="list-style-type: none"> <li>Reduces stress</li> <li>Increases relaxation</li> <li>Improves emotion self-regulation</li> </ul>	Jackie gets very anxious when she comes to her diabetes clinic visits and sometimes becomes tearful in the clinic room. Her provider teaches her to use controlled deep breathing techniques to relax when she starts to feel upset during their visit.	<ul style="list-style-type: none"> <li>Social Worker</li> <li>Psychologist</li> </ul>