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Review Article

Pediatric Consultation-Liaison Psychiatry: An Update and Review



Jessica E. Becker, M.D., Joshua R. Smith, M.D., Eric P. Hazen, M.D.

Background: *In recent years, there has been an increasing burden of child and adolescent mental illness recognized in the United States, and the need for pediatric mental health care is growing. Pediatric consultation-liaison (C-L) psychiatrists are increasingly playing a role in the management of medical and psychiatric disease for pediatric patients. The field is a fast-moving one, with understanding of new neuropsychiatric disease entities; reformulation of prior disease entities; and new interdisciplinary treatments and models of care.* **Methods:** *In this study, we aim to review recent advances in the field*

of pediatric C-L psychiatry, including new diagnostic entities, updated management of frequently encountered clinical presentations, and developments in systems of care. **Conclusion:** *The advances in pediatric C-L psychiatry are broad and serve to promote more streamlined, evidence-based care for the vulnerable population of psychiatrically ill pediatric medical patients. More work remains to determine the most effective interventions for the wide array of presentations seen by pediatric C-L psychiatrists.*

(Psychosomatics 2020; 61:467–480)

Key words: pediatric consultation-liaison psychiatry, pediatric C-L, pediatric mental health, inpatient pediatrics, integrated care.

INTRODUCTION AND OVERVIEW

Mental illness in children is a growing concern in the United States; the 2016 National Survey of Children's Health found that approximately 17% of US children younger than 18 years suffer from a mental health disorder.¹ When these children are medically hospitalized, pediatric consultation-liaison (C-L) psychiatry services can help to manage psychiatric care and improve medical outcomes. Moreover, much like in adult C-L psychiatry, these services can assist medical teams in managing the acute onset of neuropsychiatric disease, including delirium and catatonia, as well as help to identify and treat psychiatric symptoms and sequelae of systemic illnesses and treatments.² With the rise of pediatric mental health needs and the increased numbers of pediatric psychiatry patients boarding on inpatient pediatric wards awaiting placement in psychiatric facilities, the demand for psychiatric consultation to pediatric patients has been growing over the last decade.²

Despite the growth in demand, as well as rapidly expanding research and changing clinical practices in the field, a comprehensive update of the field has not been completed for over 20 years.³ As such, in this article, we review recent literature and provide an update on clinical and system-based care in pediatric C-L psychiatry, with a particular focus on the inpatient setting. Subsequently, we describe the evolution of training and practice patterns for child psychiatric consultation and identify areas in need of future studies in the field. The intent of this article is

Received January 17, 2020; revised April 18, 2020; accepted April 20, 2020. From the Division of Child and Adolescent Psychiatry (J.E.B., J.R.S., E.P.H.), Department of Psychiatry, Massachusetts General Hospital, Boston, MA. Send correspondence and reprint requests to Jessica E. Becker, MD, Department of Psychiatry, Massachusetts General Hospital, 55 Fruit Street, Boston, MA 02114; e-mail: JBecker2@mgh.harvard.edu

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Pediatric C-L Psychiatry: An Update and Review

to provide a useful update for pediatric and adult C-L psychiatrists alike, recognizing that many hospitals may not have dedicated pediatric C-L psychiatric staff to evaluate pediatric patients.

REASONS FOR CHILD PSYCHIATRIC CONSULTATION

Psychiatric consultations are requested for children in the inpatient pediatric setting for a wide variety of reasons. While some reasons overlap with requests made of adult psychiatric consultants, others are unique to the pediatric population or require a specific developmental approach. In 2016, Shaw and colleagues published the results of a survey of practice patterns completed by 64 independent pediatric C-L psychiatry services.² The survey results highlighted the most common reasons for pediatric psychiatric consultation to include suicide risk assessment, assistance in the diagnosis and management of medically unexplained symptoms, adjustment to medical illness, assessment for psychopharmacologic intervention, delirium, treatment nonadherence, and the management of children admitted to pediatric units to await psychiatric hospital placement (boarding).² Thus, the role of the pediatric psychiatry consultant is a varied one and involves components both of primary psychiatric management and of close collaboration with the pediatric medical team. Moreover, child psychiatric consultants must be knowledgeable about the diagnosis and management of psychiatric diseases that are particularly prevalent in children, such as feeding and eating disorders or attention-deficit/hyperactivity disorder. In the subsequent sections, we review updates in common reasons for inpatient child psychiatric consultations and associated management strategies. Of note, while consultation for treatment nonadherence is of great importance given its associated high morbidity and mortality,² this topic has been addressed in detail in a recent Cochrane review and will therefore not be covered in this update.⁴

Suicide Risk Assessment

Per the aforementioned 2016 study by Shaw and colleagues, the most frequent reason for consultation to pediatric psychiatry was suicide risk assessment.² This

information is consistent with other literature that shows an increased risk for suicide in patients with serious medical illness⁵ and the presence of psychopathology in 90% of suicide decedents.⁶ Thus, C-L psychiatrists are uniquely equipped to intervene in the medical setting.

The Joint Commission (TJC) Sentinel Event database reported 1089 suicides occurring from 2010 to 2017 in patients evaluated within 72 hours of care in an inpatient or emergency department (ED) setting. The most common root cause identified was shortcomings in suicide risk assessment. In 2016, TJC recommended screening all patients for suicidal ideation with a brief, standardized, and evidence-based screening tool.⁷ Therefore, for the pediatrician and pediatric C-L psychiatrist, utilization of such a tool is essential. Examples include the Ask Suicide-Screening Questions toolkit,⁸ Patient Health Questionnaire-9,⁹ Columbia-Suicide Severity Rating Scale,¹⁰ and Suicide Behavior Questionnaire-Revised,¹¹ all of which have evidence supporting their use in the pediatric patient population.¹² Using these tools, Brahmhatt and colleagues developed streamlined clinical pathways for pediatric hospitals to implement efficient and evidence-based youth suicide assessment strategies in hospitalized patients.¹³ Services should be aware that these new recommendations may increase staff burden, time spent in screening, and documentation requirements. Thus, institutional accommodations may be needed.

Medically Unexplained Symptoms

The presence of medically unexplained symptoms is another common reason for pediatric psychiatric consultation,² and one whose management has shifted over time, reflecting a broader change in thinking about these cases. With the release of the Diagnostic and Statistical Manual of Mental Disorders (DSM) Fifth Edition, important revisions were made to the diagnostic criteria for somatic symptom and related disorders (SSRDs), which are often a consideration in patients with medically unexplained symptoms. Previously, the diagnosis of a somatic symptom disorder required the symptoms to be medically unexplained, but this is no longer required. This change reflects current thinking about somatic symptom disorders, including the idea that these disorders can and often do exist in patients who suffer from organic medical conditions that also contribute to their symptoms and that

a diagnosis of somatic symptom disorder should not be made simply because a patient's symptoms do not have an identifiable medical cause.¹⁴

In keeping with this newer thinking, a working group of pediatric C-L psychiatrists from across North America, sponsored by the American Academy of Child and Adolescent Psychiatry (AACAP), has recently released the first evidence-informed clinical pathway to help standardize the diagnosis and management of SSRDs in pediatric patients.¹⁵ This pathway emphasizes early involvement of child psychiatry during a hospital stay when SSRD is part of the differential diagnosis; close interdisciplinary team collaboration, communication, diagnostic evaluation, treatment, and disposition planning; an interdisciplinary family meeting if the diagnosis of SSRD is made; and involvement of rehabilitation services as appropriate.¹⁵ Moreover, this workgroup has published scripts that can be used with families for clear, consistent communication about the SSRD diagnosis.¹⁵

Another consideration that may be relevant when evaluating a child with medically unexplained symptoms is medical child abuse, also known as caregiver-fabricated illness. While rare, the incidence of medical child abuse is estimated at approximately 0.5–2.0 per 100,000 children, and most health care practitioners will encounter the condition at some point during their practice.¹⁶ Recent consensus has shifted away from the previous terminology of Munchausen syndrome by proxy or factitious disorder by proxy. Medical child abuse is a more broadly encompassing term used to classify when a child receives unnecessary and potentially harmful medical care as a result of a caregiver falsifying or inducing medical or psychological symptoms in the child.¹⁶ The shift from the Munchausen syndrome or factitious disorder by proxy terminology to that of medical child abuse or caregiver-fabricated illness represents a shift in focus on the child as a victim of abuse, rather than on the caregiver's motivation, which can be widely variable.¹⁶ Just as with SSRDs, recent guidance emphasizes that medical child abuse should not be a diagnosis of exclusion.^{16,17} If the primary team or consulting child and adolescent psychiatrist is concerned about medical child abuse as part of the differential diagnosis of a child's symptoms, a multidisciplinary team evaluation, including medical, psychiatric, child protection, and legal teams, should be completed.¹⁶ A pediatric C-L psychiatrist has an important role in both recognizing and treating

psychopathology in the child, including potential sequelae of trauma related to the abuse, as well as working with the broader team to reverse the trend toward medicalization and minimize unnecessary medical intervention.

Altered Mental Status

Pediatric C-L psychiatrists may also be asked to evaluate patients with altered mental status, particularly when psychiatric symptoms predominate. While the differential diagnosis for acute changes in mental status is broad, we highlight here important recent updates for the pediatric psychiatric consultant's consideration.

Immune-Related Presentations

Autoimmune Encephalitis. A wide variety of systemic diseases including epilepsy, endocrinopathies, autoimmune diseases, genetic and metabolic disorders, and nutritional deficiencies, among others, can lead to psychosis in children and adolescents.^{18,19} One recent retrospective study found that 12.5% of children evaluated over a 7-year period in an urban hospital setting who met criteria for a schizophrenia spectrum disorder were ultimately found to have a medical cause or contribution to their psychotic symptoms.¹⁹ Such causes are important to identify when present as they may impact medical management and prevent future complications. Neuronal cell surface antibodies, which are associated with autoimmune encephalitis (AE), have been found in up to 9% of first-episode psychosis patient cohorts.²⁰

AE is a recently recognized disease entity, treatable by immunotherapy, which can present with behavioral changes, psychosis, changes in memory and cognition, altered levels of consciousness, seizures, and dysautonomia.²¹ In AE, autoantibodies against neuronal cell-surface markers, ion channels, and receptors can lead to disruption of neuronal signaling and brain atrophy.²¹ While these autoantibodies can develop spontaneously, they can be triggered in the setting of a tumor or virus as well; family history of autoimmune disease may also be associated with development of AE.²¹

Perhaps the most widely recognized such disorder is anti-*N*-methyl-D-aspartate receptor encephalitis, which primarily presents in children and young adults.²¹ The behavioral changes noted in children can include insomnia, irritability, temper tantrums, agitation, and decreased verbal output, while adolescents can present with hallucinations, delusions, and

catatonia.²¹ While most identified patients with anti-*N*-methyl-D-aspartate receptor encephalitis progress to having autonomic instability and seizures, some patients present with purely psychiatric symptoms, with one study estimating that 4% of anti-*N*-methyl-D-aspartate receptor encephalitis patients presented with solely psychiatric symptoms.²² Thus, AE should be a consideration in young patients with acute onset of psychiatric symptoms, including new onset of psychosis or sudden development of severe behavioral changes without clear stressor. The consulting pediatric psychiatrist should work with the primary medical team and neurologic consultants to determine diagnostic workup, which can include serum and cerebrospinal fluid autoantibody panels, magnetic resonance imaging and other imaging modalities, and electroencephalogram. Given susceptibility to neuroleptic malignant syndrome in these patients, careful consideration must be given to treatment of psychiatric symptoms²¹; sedating agents, such as benzodiazepines and valproic acid, may be most helpful.

Pediatric Acute-Onset Neuropsychiatric Syndrome/Pediatric Autoimmune Neuropsychiatric Disorder Associated With Streptococcus. Since its conceptualization 2 decades ago, pediatric C-L psychiatrists have been increasingly evaluating patients regarding concern for pediatric autoimmune neuropsychiatric disorder associated with *Streptococcus* (PANDAS) and the more general pediatric acute-onset neuropsychiatric syndrome (PANS). PANS and PANDAS, although controversial in the literature and in clinical practice, are syndromes thought to present most often with symptoms similar to those of obsessive-compulsive disorder with tics, but with sudden, rapid (24–48 h) onset with severe symptoms in children who have recently had an infection; PANDAS presents after *Streptococcus* infection and has been considered a potential variation of Sydenham chorea, while PANS, a more general term, can present after any infection.²³ In addition to its rapid onset, PANS is distinguished from primary obsessive-compulsive disorder by other potential associated factors, including an earlier age of onset; personality changes; behavioral regression; new attention-deficit/hyperactivity disorder symptoms; cognitive changes; changes in oral intake and output, such as food refusal and frequent urination; sleep changes; psychosis; sensory changes; and fine motor deterioration.²³ Treatment for PANS and PANDAS can include antibiotics, anti-inflammatories,

immunotherapy, and plasma exchange, in conjunction with standard psychiatric treatments for obsessive-compulsive disorder and tics, including psychopharmacologic agents and cognitive-behavioral therapy.^{23,24} Occupational therapy can also be useful for fine motor sequelae, such as handwriting regression.²³

While bringing to light the interface between the immune system and psychiatric disease, PANS/PANDAS have also garnered substantial debate.²³ Controversy over these syndromes is related to difficulty isolating their phenotypes from those of children with primary obsessive-compulsive disorder; the heterogeneity in reported clinical presentations and large number of potential triggers, which can make identification and appropriate treatment difficult; the high frequency of *Streptococcus* infections in children and of elevated titers in asymptomatic children; and the concern that a family's report that a child suddenly became unwell may lead to overlooking of important history, precluding a true biopsychosocial approach to the child's condition.^{23,25} Moreover, research examining the underpinnings and treatment of these conditions have often had conflicting results. Chiarello and colleagues present a thoughtful summary of the progress and simultaneous inconsistency in research findings around etiology, diagnosis, and treatment in this field.²⁴ More work is needed to allow for consistent diagnosis and identification of the most effective, least harmful, treatment of this condition.

Delirium

Delirium, as defined as an acute neuropsychiatric condition secondary to a general medical illness with cardinal features of fluctuating consciousness and impaired attention,²⁶ may impair recovery from critical illness, cause agitation, and induce perceptual disturbances.²⁷ Although often underrecognized, pediatric delirium is a common problem, present in at least 20–25% of critically ill patients,²⁸ and is associated with increased cost of care,²⁹ length of hospitalization,³⁰ mortality rate,³¹ and the risk of future development of post-traumatic stress disorder symptoms for both patients and their families.³² Risk for pediatric delirium is increased in mechanically ventilated or restrained patients; in infants due to central nervous system immaturity; and in children with relative delays in cognition, motor function, or language.^{31,33}

In recent years, multiple screening tools have been developed for pediatric delirium. The Pediatric Confusion Assessment Method for the Intensive Care Unit (pCAM-ICU) and Cornell Assessment for Pediatric Delirium (CAPD/CAPD-R) are commonly used. The CAPD is derived from the Pediatric Anesthesia Emergence Delirium (PAED) scale,²⁶ has specific questions for hypoactive delirium, and can be used in children of all ages with or without developmental delay.²⁸ The pCAM and its preschool version for children younger than 5 years (psCAM-ICU) are derived from the adult CAM rating scale which uses DSM criteria. Both tools also require a Richmond Agitation Sedation Scale (RASS) score above -4 for assessment.^{26,34}

Commonly used medications including opioids, antihistamines, anesthetics, diuretics, glucocorticoids, and benzodiazepines may exacerbate delirium.^{26,31} In one recent study, benzodiazepines were found to be an independent risk factor for pediatric delirium, but opioids were not. While opioid use should still be limited, this finding suggests the targeting of analgesia over sedation in delirious patients, ideally optimizing mobilization and improved pain recognition.³⁵ Other evidence-based means of pediatric delirium prevention include reduction of pain, sleep disturbance,³⁶ and physical restraint use; addressing sensory and communication difficulties; ensuring early mobilization^{35,36}; and providing frequent reorientation, including the use of familiar items from home and the consistent presence of the child's caregivers.²⁶

With regard to treatment, there are currently no Food and Drug Administration–approved medications in the treatment of delirium in adult or pediatric patients. Furthermore, the available evidence for the management of delirium is primarily focused on adult patients. However, the literature on treatment of pediatric delirium continues to grow; and, along with extrapolation from adult studies, specific treatment recommendations can be formed. At present, there is evidence-based support for the use of antipsychotics, alpha-2 agonists, and melatonin in adult and pediatric delirium and valproic acid in adult delirium alone.³⁷ Clinical pathways have been developed through the Physically Ill Child Committee of the AACAP in an effort to standardize management of pediatric delirium based on evidence and expert consensus. There are pathways for both prevention and management of pediatric delirium, which can be helpful in guiding management of this condition.³⁸

Antipsychotics have been the mainstay of delirium treatment, with haloperidol, risperidone, olanzapine, and quetiapine showing equivalent safety profiles and improvement in agitation, sleep-wake disturbance, and symptom severity.^{39–41} They may also result in decreased utilization of deliriogenic agents.^{39–41} Very low dosages can be used to treat infants and toddlers, with higher doses needed in adolescents.^{26,42} However, recent studies from the adult literature have called the use of antipsychotics in delirium into question.^{43,44} Greater research into the mode of action in both adult and pediatric patients is needed.

Additional treatments available in pediatric delirium include melatonin and alpha-2 agonists. Clonidine and dexmedetomidine have been safely used in the intensive care setting, are associated with a decreased risk of delirium by reducing the use of opioids and benzodiazepines, and have been shown to decrease incidence and duration of emergence delirium in pediatric patients.^{26,45–47} When compared with clonidine, dexmedetomidine has a shorter half-life, greater opioid-sparing effect, and fewer adverse effects.⁴⁸ At present, the benefits of melatonin in delirium are unclear, although supplementation may be of clinical benefit given that its secretion from the pineal gland is decreased in critical illness.⁴⁹ Regardless, given the relatively benign nature of melatonin, administration in cases of delirium with comorbid sleep disturbance is recommended.⁵⁰

Catatonia

Catatonia in children is often underdiagnosed and undertreated, but recognition of this dangerous and potentially lethal syndrome in the pediatric population has been growing in recent years.^{51,52} Some one-fifth of pediatric catatonia cases are due to underlying medical conditions, including infections, seizures, autoimmune diseases, metabolic diseases, toxidromes, and medication side effects, making it particularly relevant in the inpatient pediatric medical setting.⁵¹ Yet, the diagnosis of catatonia can be a challenging one to make in children and adolescents, resulting in treatment delay of this serious condition, given indeterminate presentations that may overlap with other presentations. For instance, some developmental disorders, including autism spectrum disorder (ASD), Prader-Willi syndrome, and Kleine-Levin syndrome, are associated with higher rates of catatonia; however, features of the underlying developmental disorder, such as stereotypic

movements and decreased speech in ASD, may appear similar to signs of catatonia and must be carefully delineated.⁵² Moreover, Sorg and colleagues recently presented the case of a patient whose history of oppositional behavior led to misattribution of inappropriate laughter, echolalia, waxing/waning mutism, refusal to follow commands, and lack of cooperation, resulting in delayed identification and treatment of his catatonia syndrome.⁵¹ In addition, certain symptoms of catatonia, such as behavioral agitation and urinary incontinence, may be more common in children than in adults,⁵¹ yet these same symptoms can be associated with a variety of diagnoses in children.

As in adults, a Bush-Francis scale can be used to assess symptoms of catatonia, although a validated scale specifically designed for children and adolescents, the Pediatric Catatonia Symptom Rating Scale, was recently developed.⁵³ First-line treatment should be with intravenous or intramuscular lorazepam. Exacerbating medications, such as dopamine D2 receptor-blocking agents such as antipsychotics, should be discontinued and avoided. Should the patient's symptoms not improve with escalating doses of lorazepam, there is evidence that N-methyl-D-aspartate antagonist medications, such as amantadine or memantine, can be useful to augment treatment.⁵¹ If symptoms remain refractory or the patient develops life-threatening symptoms, such as vital signs of instability or other signs of malignant catatonia, electroconvulsive therapy should be considered; however, the practitioner should be mindful that some states have age restrictions and regulations in place that may limit access to electroconvulsive therapy for pediatric patients.⁵¹

Boarding

In recent years, many hospitals have been admitting children awaiting psychiatric hospitalization to inpatient pediatric floors under nonmedical admissions, a practice that has been termed “boarding” and has become a common reason for child psychiatric consultation. TJC defines “boarding” as holding a patient in a temporary location in the hospital while awaiting placement that is not yet available.⁵⁴ Boarding is also the appropriate term for children admitted medically with co-occurring psychiatric and medical needs who, once medically stable, are maintained inpatient medically while awaiting placement in a psychiatric inpatient unit.⁵⁴

Boarding has become more commonplace in recent years as ED visits for child psychiatric emergencies have been increasing—nearly doubling since 2001⁵⁵—while the availability of pediatric inpatient psychiatric beds nationally has been decreasing.^{55,56} These opposing trends have led to a crisis, with pediatric patients often waiting days for treatment in an inpatient psychiatric setting. EDs are generally not equipped to handle longer-stay patients and often do not have the same support services that medical pediatrics floors may have, such as Child Life or Occupational Therapy services⁵⁶; as a result, increasing numbers of pediatric psychiatric patients are being admitted to board on inpatient pediatric floors to await psychiatric placement. One study based in a single medical center over an 18-month period found that 50% of children meeting criteria for involuntary psychiatric hold were admitted to the pediatric medical unit where they received suboptimal care and accrued a cost of over \$4000 per patient.⁵⁷ Children with complex psychiatric needs, such as those with autism or developmental delays, as well as those with more acute psychiatric needs, may be particularly difficult to place into psychiatric facilities.^{54,56,58} Paradoxically, then, the children perhaps most in need of immediate psychiatric care are often the patients relegated to waiting the longest for placement.

Boarding pediatric patients with psychiatric emergencies on the inpatient pediatric floor poses particular challenges as the dedicated physical and therapeutic supports of the inpatient psychiatric unit are not available. As compared to inpatient psychiatric units, pediatric medical floors may be unlocked; allow access to potential mechanisms of injury; have less optimal supervision; and have limited, if any, staff trained to manage psychiatric patients.⁵⁶ Thus, in addition to providing medication recommendations, the consulting pediatric C-L psychiatrist must work with the primary team to devise a safe plan for the patient while the patient is admitted to the pediatric floor. Recent consensus guidelines for pediatric psychiatric patients in the ED may serve as a reference for agitation contingency planning once patients become boarders; these guidelines suggest nonpharmacologic deescalation techniques, such as verbal and behavioral deescalation, as a first-line for agitation in children, followed by medication interventions ranging from diphenhydramine, lorazepam, and clonidine to atypical antipsychotic medications.⁵⁹

While pediatric boarding cannot replace the structure and services of an inpatient psychiatric unit,

consulting pediatric psychiatrists can provide support beyond medication management. In an effort to advance a patient's psychiatric care while they await appropriate level of care, the consulting pediatric psychiatry team can liaise with outpatient treaters and may be able to deliver or arrange for brief bedside therapy. Gallagher and colleagues at Boston Children's Hospital recently demonstrated that by providing brief supportive or behavioral therapy, medication recommendations, behavioral plans, and safety observations, scores on the Clinical Global Impression Scale for pediatric boarders improved significantly from admission to discharge.⁵⁴

SPECIAL POPULATIONS IN PEDIATRIC C-L PSYCHIATRY CARE

Considerations in Medically Ill Children

A common reason for psychiatric consultation in the pediatric medical setting is adjustment to medical illness, particularly given the impact of a chronic medical condition on a child's development.^{2,60} As the psychological and neurobiological sequelae of chronic physical illness are increasingly recognized, the contribution from mental health care providers to medically ill pediatric patients is being increasingly recognized and formalized, particularly among certain illnesses, such as pediatric cancers, epilepsy, cystic fibrosis, and sickle cell disease.⁶⁰⁻⁶³ For instance, the Cystic Fibrosis Foundation and European Cystic Fibrosis Society recently partnered to produce consensus guidelines on implementing developmentally appropriate psychoeducation and screening for anxiety and depression in cystic fibrosis patients and their caregivers, as well as recommendations for specific treatments, such as cognitive behavioral therapy, selective serotonin reuptake inhibitor medications, and benzodiazepines.⁶⁴ Kazak and colleagues composed a recent literature review demonstrating the need for routine, systematic assessments of psychosocial needs in children and caregivers with cancer,⁶⁵ while the international Posterior Fossa Society determined in a recent consensus meeting that identification and treatment of emotional and behavioral morbidities in this population is an important avenue for upcoming work.⁶⁶ These developments suggest that routine screening for psychiatric disease in children with medical conditions is becoming more commonplace, although work remains

to expand such practices more broadly to children with a variety of other chronic and nonchronic medical illnesses.

Autism Spectrum Disorder

The prevalence of ASD has been rising steadily for decades, with recent estimates indicating that 1 out of 40 children in the United States meet criteria for ASD.⁶⁷ This is of particular relevance for pediatric C-L psychiatrists, as children with ASD have higher rates of medical illness than the general population, including higher rates of epilepsy, gastrointestinal disorders, allergies, obesity, nutritional deficiencies, and certain kinds of immunologic disorders.⁶⁸ As a result, children with ASD have higher rates of health care utilization than the general population, including a significantly higher frequency of both ED visits⁶⁹ and inpatient medical admissions.⁷⁰ The length of stay for medical admissions is approximately 50% greater for patients with ASD than for typically developing patients,⁷¹ reflecting the complexity of the needs of this patient population.

Children with ASD and their families often face considerable challenges when interfacing with the medical system, particularly during inpatient medical admissions, and are often dissatisfied with their care.^{72,73} Some of these challenges are rooted in the core symptoms and impairments associated with ASD.⁷⁴ Impairments in communication and social interactions can make it difficult for patients to express their symptoms, needs, and concerns to medical care providers, and conversely it can be difficult for providers to clearly express their intentions to the patient. Sensory stimuli associated with the hospital environment that many medical providers take for granted, such as the sound of monitors or the feel of a hospital identification bracelet, have been shown to make hospitalization more stressful for patients with ASD, many of whom have sensory sensitivities.⁷⁵ Finally, many individuals with ASD take comfort in strict adherence to routines, which are disrupted by hospitalization, and have difficulty in unfamiliar settings.

Pediatric C-L psychiatrists are often called upon to help patients with ASD and their families navigate the difficulties associated with medical hospitalization, a role that can be expected to grow as diagnoses of ASD continue to increase. The psychiatrist's role begins with a thorough, developmentally informed assessment that

gathers relevant information about the patient's level of cognitive functioning, preferred communication methods, past psychiatric history, active psychiatric symptoms, and risk of challenging behaviors such as agitation, aggression, or self-injury.⁷⁴ The history should include a review of potential triggers for agitation or distress, as well as ways that the patient typically expresses distress and effective strategies for soothing the patient. This information, along with collateral from outpatient providers, can be integrated into a patient-specific care plan designed to prevent distress and provide contingencies for managing difficult behaviors that may arise.⁷⁶ There are several elements commonly used in such plans that have been shown to be effective. Generally, these may involve facilitating communication, reducing anxiety associated with unfamiliar providers and routines, and sensory-based approaches to reduce triggers and use helpful soothing strategies.⁷⁷⁻⁷⁹ A more detailed discussion of these strategies can be found in a 2019 review in *Psychosomatics* by Thom and colleagues.⁷³

Pharmacologic interventions for pediatric inpatients with ASD include management of comorbid psychiatric symptoms, such as anxiety or hyperactivity, identifying medications, such as corticosteroids, that have the potential to exacerbate behavioral difficulties, and preventing and treating disruptive behaviors.⁷⁴ Some patients may benefit from a temporary increase in preadmission medications targeting anxiety or agitation while they are in the hospital. Coordination with outpatient providers and a thorough history that includes past adverse medication reactions as well as the use of as-needed medications that have been helpful are particularly important as children with ASD and intellectual disability may exhibit sensitivity to medications, including potential for paradoxical reactions to medications, such as benzodiazepines, that are commonly used in the hospital setting.⁸⁰

Avoidant/Restrictive Food Intake Disorder

With the release of the DSM Fifth Edition, several conditions frequently assessed and treated by pediatric psychiatric consultants were defined and revisited.¹⁴ One notable addition was the definition of a new diagnosis, Avoidant/Restrictive Food Intake Disorder (ARFID), expanding the scope of the previously defined Feeding Disorder of Infancy and Early Childhood.⁸¹ While anorexia nervosa is defined as a restriction of energy

intake leading to low body weight associated with fear of gaining weight and impaired perception of one's body weight or shape, patients with ARFID also have restriction of energy intake but do not have impaired perception of their weight or shape.⁸² Given its recent delineation, the full burden of ARFID in pediatric populations is not yet well known.^{81,83} However, studies have indicated a prevalence of approximately 3% in school-aged children, with estimates as high as 10–20% of patients within eating disorder programs.⁸¹ Various studies have suggested that compared with patients with other eating disorders, patients with ARFID tend to be younger, to have more medical and psychiatric comorbidities, and to be more often male.⁸³

Children with ARFID may be medically hospitalized for low weight or malnutrition. In making the diagnosis, the pediatric C-L psychiatrist should be mindful that direct medical or psychiatric causes of disordered eating have been ruled out in patients with ARFID.⁸³ As the disorder is increasingly recognized, guidelines for diagnostic and treatment approaches are being developed, including recommended workup.⁸⁴ Moreover, a thorough assessment of the patient's attitude toward weight and body image is vital to verify the ARFID diagnosis and to rule out other eating disorders.⁸⁴ Screening tools, such as the Pica ARFID and Rumination Disorder Interview, Eating Disorders in Youth Questionnaire, and Nine-Item ARFID Screen can also be useful in making the diagnosis and tracking symptoms over time.⁸⁴

Once the diagnosis has been made, the treatment for ARFID requires a multidisciplinary approach to achieve weight restoration and address disordered eating behaviors. In addition to ruling out medical causes or sequelae of the restrictive eating symptoms, pediatricians should be involved to set a reasonable target goal weight for the patient.⁸⁴ Mental health care providers, including psychiatrists and behaviorists, gastroenterologists, dietitians, occupational therapists, and speech and swallow specialists, may all play a role in ARFID treatment.^{84,85} Medications that have shown some efficacy in the treatment of ARFID patients include cyproheptadine, olanzapine, mirtazapine, lorazepam, and fluoxetine, although none is approved by the US Food and Drug Administration for this purpose and there have been no large, double-blind, randomized studies.^{83,84} More research is needed to determine standardized medication recommendations for ARFID.

Children and Adolescents with Substance Use Disorders

In the past decade, the number of youth seeking treatment for substance use disorder has risen significantly,⁸⁶ a phenomenon mirrored in the inpatient setting. In the United States, Egorova and colleagues reported that in 2012, 483,281 pediatric medical inpatient admissions were associated with a behavioral health diagnosis, with 26% of those diagnoses being substance use disorder.⁸⁷ More recently, a study by the Canadian Institute for Health Information reported that between the years 2017 and 2018, 5% of pediatric medical inpatient hospitalizations for patients aged 10–24 years were related to harm from substance use.⁸⁸ For the pediatrician, rapid identification is paramount, given the increased risk of lifelong dependence^{89,90} and the potential negative impact of substance use disorder on a myriad of medical conditions.^{90–94} In this population, psychiatric consultation can be of great benefit, given the high degree of psychiatric comorbidity⁹⁵ and the opportunity afforded in the inpatient setting to begin effective pharmacologic⁹⁶ and psychosocial⁹⁷ interventions for substance use disorders.

EVOLVING TRENDS IN THE FIELD

As the need for pediatric psychiatric consultation grows, innovations have been coming to the field to allow more streamlined training, clinical care, and care systems. Here, we highlight these innovations and comment on the ongoing need for continued evolution and research in pediatric C-L psychiatry.

Changes in Terminology

Although psychiatric consultation to medical specialties has been a practice in the United States for at least a century,⁹⁸ ever-growing demand and energy in the field has led practitioners more recently to consider how best to label their role. Psychosomatic medicine was the term for the psychiatric consultation subspecialty approved by the American Board of Medical Specialties in 2003 and was previously used by the national academy of the field, the Academy of Psychosomatic Medicine (APM). More recently, concern grew that the term psychosomatic medicine was too narrow for the work of the subspecialty and implied that practitioners focus on somatoform disorders only, rather than the broad array of psychiatric manifestations of disease.⁹⁸

As such, after several decades of growing momentum, and with support of its members and the American Psychiatric Association, the APM advocated for the subspecialty to be renamed Consultation-Liaison Psychiatry, which was approved in October 2017; this was followed a month later by APM voting to change its name to the Academy of Consultation-Liaison Psychiatry.⁹⁸ The term consultation-liaison (C-L) psychiatry reflects the broader scope of clinical practice, beyond somatoform disorders, as well as the unique role of C-L psychiatrists in connecting with other medical providers to provide holistic patient care.

Training

As the need for child psychiatric C-L care grows, the formalization of training in this subspecialty is increasingly important. Walker and colleagues have succinctly laid out the various paths to prepare trainees for work in pediatric C-L psychiatry and the strengths and weaknesses of each.⁹⁹ More recently, recognizing that most training of pediatric C-L specialists occurs in Child and Adolescent Psychiatry Fellowships and that formalized goals for this education did not exist, AACAP's Physically Ill Child Committee assembled a special interest study group to develop best practices of C-L education for child and adolescent psychiatry fellows.¹⁰⁰ This group developed and published core competencies for pediatric C-L psychiatry training, using the subcompetency framework developed by the Accreditation Council for Graduate Medical Education.¹⁰⁰ More work is needed to build on this framework and establish more formalized curricula for training across programs.

Guidelines and Practice Pathways

As requests for child psychiatric consultation grow, efforts have been made by AACAP's Physically Ill Child Committee and others to standardize practice patterns across settings. Clinical pathways have been developed in an attempt to standardize the care of SSRDs, delirium, and suicide risk screening, based on evidence, when available, and expert consensus.^{13,15,38} This growing trend for evidence-based and best practices in child psychiatric consultation aims to improve quality of care. Given the success of these pathways, and the broad range of complicated illnesses evaluated by child psychiatric consultants, there is ample opportunity in the field for creation of future pathways.

Technological Innovation

In a time of ever-growing technological advancement, there has been recent growth in methods used to connect practitioners with one another and with patients. AACAP's Physically Ill Child Committee maintains a useful electronic listserv that connects pediatric C-L psychiatrists across the country, providing a mechanism of sharing and disseminating best practices and innovations, a nexus for research collaborations, and a way for individual clinicians to obtain rapid access to expert consultation for unique clinical challenges that inevitably arise in the field.

Technological innovation has also impacted clinical care more directly through the advent of telepsychiatry, the use of communication technology to conduct remote psychiatric evaluation and management. Telepsychiatry has been most widely used in outpatient and ED settings but has also been used to conduct inpatient psychiatric consultations when access to in-person psychiatric providers is limited.^{101,102} In the wake of the COVID-19 pandemic in 2020 and associated attempts to limit traffic in hospitals for infection-control purposes, many hospitals rapidly implemented pediatric telepsychiatry consultation models. As these programs roll out, there will be a need for future studies to evaluate the efficacy of telepsychiatry in the inpatient pediatric setting, as such programs may allow for expanded access to child psychiatric C-L services across the country.

Funding Challenges and New Models of Care

As the health care payer landscape shifts from fee-for-service models to population health and risk-sharing strategies, child psychiatric consultations will likely have an increasing role in management. Recent studies have shown a high growth of medical hospitalizations and costs for children with comorbid psychiatric disease, as compared to those without,¹⁰³ as well as longer hospital lengths of stay and higher rates of hospital readmission for medical illnesses in children with psychiatric disease.¹⁰⁴⁻¹⁰⁶ Initial evidence suggests that psychiatric intervention may improve overall medical outcomes, health care utilization, and costs in these populations. For instance, in a recent study of pediatric admissions at a freestanding, tertiary pediatric hospital, Bujoreanu and colleagues demonstrated that earlier involvement of child psychiatric consultation led to shorter lengths of stay and

lower overall hospital charges, and evidence suggests that psychiatric intervention for children with particular chronic medical conditions can lead to lower overall health care utilization.¹⁰⁷⁻¹⁰⁹ Future research should build on this work to assess systematically the benefit and cost-effectiveness of pediatric psychiatric consultation for children with comorbid medical and psychiatric illness.

In the wave of population health strategies, the importance of preventative psychiatric care in the outpatient medical setting has also been increasingly recognized, with benefits for long-term medical and psychiatric outcomes. Such outpatient integrated care systems, which range from care coordination to colocation to collaborative care models to fully integrated medical-psychiatric practices, are increasingly being developed, and their value to expand psychiatric treatment access and improve outcomes is increasingly being recognized.^{110,111} Asarnow and colleagues recently completed a review of randomized, controlled trials of a variety of pediatric integrated medical-behavioral care and found good benefit for mental health outcomes, particularly for collaborative care models and for treatment models; the study found weaker evidence for the use of integrated care for preventative care or for substance use.¹¹⁰ This review was limited by the small number of available trials evaluating integrated care in the pediatric population.¹¹⁰ Thus, future work remains to systematically evaluate the benefits and costs of the multitude of integrated care models to determine the most useful and efficient strategies for outpatient child psychiatric consultation management.

CONCLUSION

In this article, we have reviewed recent updates in disease classification and clinical management to inform the psychiatric consultant evaluating pediatric patients. We have also described recent changes to the practice of the field from a systems level, including areas of ongoing research. As the need for pediatric C-L psychiatry has grown, the core principles of the field have remained stable, including formulating both medical and psychiatric illness through a developmental lens and using a collaborative, team-based approach. However, as we have reviewed, there have been several recent advances that propel the field forward, including

the development of new diagnostic and disease entities; updates in clinical management; and systems-level changes, such as efforts to develop more streamlined and evidence-based care, technological advances to connect patients and practitioners, and new outpatient psychiatric consultation models. Going forward, ample work remains to address the ever-growing need for pediatric mental health services and to develop the most effective and cost-effective clinical and systems

strategies for psychiatric intervention in the pediatric medical setting.

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Disclosures: The authors report no proprietary or commercial interest in any product mentioned or concept discussed in this article.

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