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Learning Objectives

After reading these articles, you should be able to:

1. Identify strategies for improving accuracy in diagnosing bipolar disorders in children and adolescents.
2. Describe the challenges of diagnosing catatonia in children and adolescents.
3. Assess the presence of sensory processing problems across diagnostic categories in children and adolescents.
4. Summarize some of the findings in the literature regarding psychiatric treatment for children and adolescents.

Bipolar Spectrum Disorders in Children and Adolescents

Anthony Charuvastra, MD. Adjunct Assistant Professor, NYU Langone Medical Center Department of Child and Adolescent Psychiatry. New York, NY.

Dr. Charuvastra, author of this educational activity, has no relevant financial relationship(s) with ineligible companies to disclose.

Bipolar disorder (BD) is challenging to diagnose in children and adolescents, yet timely and accurate diagnosis is crucial. Delayed diagnosis can result in ineffective treatment and substantial morbidity, while misdiagnosis risks unnecessarily exposing patients to medication side effects. Despite ongoing controversies about BD in prepubertal children, there is a body of research specific to children and adolescents. This article unpacks BD and offers recommendations for assessment.

Highlights From This Issue

Feature article
The identification of bipolar disorder in children and adolescents is complicated by different perspectives on the scope and character of these conditions.

Feature Q&A
Catatonia is more common than we tend to recognize and has complex relationships with psychosis, autism, and the use of antipsychotics.

Q&A on page 6
Sensory processing challenges occur across diagnostic categories, and our management of them can lead to more effective care.

Ask the Editor on page 11
Is it safe to recommend lavender for pediatric patients with anxiety? Our Ask the Editor feature gives you a cautious "maybe."

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Q&A With the Expert

Assessing and Treating Catatonia in Children and Adolescents
Lee Wachtel, MD

Medical Director, Neurobehavioral Unit, Kennedy Krieger Institute. Psychiatry Professor, Johns Hopkins School of Medicine. Baltimore, MD.

Dr. Wachtel, expert for this educational activity, has no relevant financial relationship(s) with ineligible companies to disclose.

CCPR: Let's start by identifying what we mean when we talk about catatonia in children and adolescents.

Dr. Wachtel: Catatonia is marked by a change from the person's baseline state with distinct motor, vocal, and behavioral symptoms. Clinicians usually think of a catatonic person as being like a statue—immobile, unresponsive, staring, and with waxy flexibility. But look at DSM-5—catatonia can also manifest as psychomotor agitation with repetitive, stereotypical, purposeless behaviors that escalate to aggression and self-injury and can include dangerous autonomic dysfunction. Agitation is common in children and adolescents, especially with autism. And while catatonia-related agitation may happen in the context of stressors, when there is no clear environmental reason for the agitation, it may be part of catatonia. *(Editor's note: See sidebar on page 2 for reference.)*

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Expert Interview—Assessing and Treating Catatonia in Children and Adolescents
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CCPR: How common is catatonia in children and adolescents?

Dr. Wachtel: Studies on adults range from 6% in outpatient settings to 32% on specialized neurologic units. In pediatrics we have two studies. A French study 19 years ago found an incidence of 0.6% but in a specialized setting that may have reduced case identification (Thakur A et al, *Aust N Z J Psychiatry* 2003;37(2):200–203; Cohen D et al, *J Am Acad Child Adolesc Psychiatry* 1999;38(8):1040–1046). The other study from India found catatonia in about 6% of inpatients.

CCPR: What about in autistic patients?

Dr. Wachtel: The numbers for catatonia are higher in autism, ranging from 12% to 18% (Billstedt E et al, *J Autism Dev Disord* 2005;35(3):351–360; Hare DJ and Malone C, *Autism* 2004;8(2):183–195). There's been more recognition in the past 20 years of a shared genetic susceptibility between schizophrenia, autism, and catatonia. Some researchers hypothesize that autism itself may be an early form of catatonia, which may become more evident as the child develops.

DSM-5 Diagnostic Criteria for Catatonia

The DSM-5 criteria for diagnosis of catatonia require the presence of three or more of these 12 psychomotor features during most of the episode:

- Agitation, not influenced by external stimuli
- Catalepsy
- Echolalia
- Echopraxia
- Grimacing
- Mannerism
- Mutism
- Negativism
- Posturing
- Stereotypy
- Stupor
- Waxy flexibility

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This CME/CE activity is intended for psychiatrists, psychiatric nurses, psychologists, and other health care professionals with an interest in the diagnosis and treatment of psychiatric disorders.

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CCPR: What other conditions are associated with catatonia?

Dr. Wachtel: Affective illness and psychotic illness are the first and second most common comorbidities associated with catatonia. Trisomy 21, Prader-Willi, velocardiofacial, and Phelan-McDermid syndromes are associated with catatonia, and the latter three have susceptibility loci for psychosis as well. The behavioral phenotype at a younger age may look like autism and as time goes on catatonia may emerge, often complicated with affective and psychotic pathology. Anti-NMDAR receptor encephalitis and other encephalitic pictures also present with psychosis and catatonia.

CCPR: Is puberty a trigger?

Dr. Wachtel: Adolescence is often when illnesses like affective and psychotic disorders emerge, and these are associated with catatonia. From an endocrine perspective, catatonia is a state of GABAergic dysregulation, and puberty is when GABA tone increases to adult levels.

CCPR: How do we assess patients for catatonia?

Dr. Wachtel: Get the history from family members since patients vary significantly in what they can share. Ask about and look for the motor, vocal, and behavioral symptoms in the DSM-5 and/or the Bush-Francis Catatonia Rating Scale (www.tinyurl.com/4yzm27nf) and assess for autonomic symptoms. Look for Parkinsonian symptoms since those might be present in catatonia. Check the range of motion in your patient's arms at the elbow and wrist joints, looking for rigidity, resistance to movement, tone, and any cogwheeling. Waxy flexibility really feels as if the patient's limb was made of soft wax. Position the patient's arm in the air and see if it remains there when you release it. Look for "getting stuck" during movements, unusual repetitive movements, facial grimacing, staring, and stupor.

CCPR: And what about lower body or walking?

Dr. Wachtel: Watch how the patient goes from sitting to standing, noting any difficulty in moving fluidly. Ask them to walk down the hallway. Do they have a shuffling gait? Are they slow? Do they lack an arm swing? What does their pivot look like? Evaluate the overall ability to initiate, change, and cease movement. Is there festination (speeding up) and/or retropulsion (walking backwards)?

CCPR: What about vocal and behavioral symptoms?

Dr. Wachtel: Vocal symptoms include frank mutism and/or loss of other forms of communication (eg, use of an iPad or augmentative communication device). There is a wide range of behavioral symptoms such as automatic obedience, ambitendency, echophenomena (any automatic imitation), and purposeless agitation.

CCPR: Can you explain automatic obedience and ambitendency and how to assess for these?

Dr. Wachtel: Automatic obedience is when the patient does what you say even if it doesn't make sense. It can be assessed pretty simply. I will often tell the patient: "Please stick out your tongue; I'm going to put a pin in it." Ambitendency is hesitation or ambivalence when you challenge the patient with opposing gesture and command. To assess for this, I hold out my hand and

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Expert Interview—Assessing and Treating Catatonia in Children and Adolescents

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ask the patient to shake it. Then I hold out my hand and instruct the patient to NOT shake it. With a smaller child, I might jump up and down and ask the child to do the same, then jump up and down and ask the child to NOT do the same.

CCPR: What about purposeless agitation? What does that look like?

Dr. Wachtel: A catatonic patient may be frenetic, engaging in purposeless motor activity. The agitation can progress to where a patient looks like a wind-up toy gone mad, with repetitive self-injurious behavior of incredible frequency and intensity when the patient is not restrained. Many autistic children engage in repetitive self-injurious behavior, and while in some children this behavior is a response to something in their environment, in others it is part of catatonia.

CCPR: What other questions should we ask to clarify symptoms of catatonia?

Dr. Wachtel: Ask about the patient's ability to perform tasks, response times, and any loss of skills. Do they need a lot of prompting? These kids take a lot longer to do tasks than before or do not complete them at all. This isn't childhood obstinance. Older patients with catatonia often withhold urine and stool, but children typically lose bladder or bowel continence. With developmental disabilities, skills that take years—reading, piano, or any learned ability—may be lost. The first population-based study on catatonia in autism spectrum disorders commented upon the frequent slowness, amotivation, and prompt-dependence in these patients (Wing L and Shah A, *Br J Psychiatry* 2000;176:357–362).

CCPR: Catatonia symptoms might be confused with mood disorders, psychosis, and autism.

Dr. Wachtel: There can certainly be overlap in some symptoms. Some depressed kids are quite unresponsive. But when an autistic patient very suddenly loses skills, becomes slow or unresponsive, or engages in new purposeless, repetitive behaviors, think about catatonia and look for other symptoms.

CCPR: Can this withdrawal or disinterest extend to appetite and eating?

Dr. Wachtel: Yes. Pay attention to food refusal as a manifestation of negativism. This is different from an autistic child who, for example, may only eat purple foods. Any child may develop avoidant/restrictive food intake disorder (ARFID), which is itself dangerous *(Editor's note: See* The Carlat Child Psychiatry Report, *July/Aug/Sept 2022 for more on ARFID)*, but in autism consider a catatonia diagnosis. Catatonia may progress to the point where patients totally refuse food and drink. We've had children end up on nasogastric or gastrostomy tubes.

"Many families won't consider ECT initially, but as the situation deteriorates, they realize that catatonia can become a life-or-death situation."

Lee Wachtel, MD

CCPR: We've talked about motor, vocal, and behavioral symptoms. What about autonomic symptoms?

Dr. Wachtel: Symptoms of autonomic dysfunction include excessive sweating, flushing, acrocyanosis (blue extremities), or unstable vital signs including fever, high or low blood pressure, and elevated heart rate. These may indicate malignant catatonia, also known as neuroleptic malignant syndrome (NMS), a severe form of catatonia that can be fatal if left untreated and should prompt immediate treatment.

CCPR: Many of us trained during a time when NMS was not identified as a form of catatonia. Can you clarify how NMS was recognized as a form of malignant catatonia?

Dr. Wachtel: When NMS was first observed after chlorpromazine and other antipsychotics became more widely used, including antiemetics, the thinking was that NMS should be treated through dopamine agonism, supportive therapy like hydration, and bromocriptine. Malignant catatonia refers to hemodynamic and thermoregulatory instability in catatonic patients, where patients may have hyper- or hypotension, brady- or tachycardia, and elevated or decreased core body temperature. This can lead to global organ system collapse and death. NMS has this same rigidity, dystonia, and autonomic dysfunction, and is largely now conceptualized as malignant catatonia caused by an antipsychotic, so withdrawing the agent is the first step, with subsequent rapid implementation of anticatatonic treatment paradigms: benzodiazepines and electroconvulsive therapy (ECT). ECT is literally a lifesaver in NMS.

CCPR: So let's talk about treatment. What should be our initial treatment approach?

Dr. Wachtel: The first-line treatment for catatonia is benzodiazepine therapy. I usually use lorazepam because it's cheap, readily available, and can be administered with TID dosing. We usually start with 0.5 mg TID and then increase the dosage by 0.5 mg TID every two to three days based on response. It is often necessary to push the dosage quite high to effectuate a response, well beyond what a noncatatonic patient could tolerate. For example, I had a mute, unresponsive patient who needed 8 mg TID of lorazepam and would get up and dance upon administration. When benzodiazepines are insufficient, or the potential morbidity and mortality of the patient is high, then ECT is the definitive treatment for catatonia.

CCPR: Tell us more about using ECT for catatonia in children and adolescents.

Dr. Wachtel: ECT is a rapid and robust treatment for catatonia that hasn't responded to benzodiazepines. It can rapidly and safely treat malignant catatonia/NMS, sometimes within two or three days with daily ECT ("en bloc"). Some patients are out of the ICU after two ECT treatments. ECT is one of the few interventions in child psychiatry where we can quickly save somebody's life. Untreated, NMS carries a 10%–20% mortality rate (Fink M and Taylor A. *Catatonia: A Clinician's Guide to Diagnosis and Treatment*. Cambridge University Press; 2006). Some patients have a chronic course and might require several years of ECT in gradually decreasing frequency, from several times per week to every three months.

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CCPR: Child psychiatrists are often wary of ECT. How do you address their concerns?

Dr. Wachtel: In recent years, the American Academy of Child & Adolescent Psychiatry expanded teaching about catatonia and ECT. It is a paradigm shift for pediatric practitioners to imagine that a controlled seizure can have beneficial effects on the brain. Some families have been vocal about their children's positive experiences with ECT, and they've paved the way for other families to feel comfortable pursuing ECT.

CCPR: How do families respond to your recommendation for ECT?

Dr. Wachtel: I have heard responses ranging from "that's horrible" or "I would never do that" to "when can we start?" Education is key. I'm frank with them and I demystify the process by explaining exactly what happens. I make myself available to families to ask questions and gather information so they can make the best decision for their child. We also have an internal network to connect families with other families after they've had a chance to speak with me, so the educational process is not limited to talking to the professional.

CCPR: Do some families decline ECT?

Dr. Wachtel: Many families won't consider ECT initially, but as the situation deteriorates, they realize that this can become a life-or-death situation. I had a parent who was tearful and upset until I showed him a video of the ECT process, and his response was "that's it?" In terms of visible motor activity, not much happens in modern, modified ECT with anesthesia and neuromuscular blockade.

CCPR: How do you treat patients who have psychosis with catatonia?

Dr. Wachtel: Antipsychotics can worsen catatonia, and we typically discontinue them. Once the catatonia is gone, you can target the psychosis. We have had mute, unresponsive patients in whom it became clear that they were floridly psychotic during the initial course of ECT, and we subsequently were able to start an antipsychotic. During maintenance ECT, I use lithium or lamotrigine for maintaining clinical stability while decreasing ECT frequency. *(Editor's note: When using lithium and ECT, you may need to use lower doses of lithium to avoid delirium.)*

CCPR: What do you do when patients do not respond or cannot tolerate lithium or lamotrigine?

Dr. Wachtel: Some respond to atypical antipsychotics. When using an antipsychotic, monitor the CPK and WBC, at least in the early stages of therapy, to pick up any early warning signs of malignant catatonia/NMS. Some patients remain moderately negativistic in terms of food refusal even after ECT and may anecdotally benefit from a low dose of olanzapine to increase appetite. I prefer using atypical over typical antipsychotics because of the increased risk profile with the latter.

CCPR: Any final thoughts?

Dr. Wachtel: Catatonia is more common than you might realize, especially if you work with patients with neurodevelopmental challenges. Recognition of catatonia is one of those areas in child psychiatry where you can save somebody's life. We need to be vigilant just like we are about suicidal ideation because patients' lives depend on our astuteness.

CCPR: Thank you for your time, Dr. Wachtel.

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Bipolar Spectrum Disorders in Children and Adolescents

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What is the bipolar spectrum?

Many researchers use the term "bipolar spectrum disorder" (BPSD) to include cases of bipolar I (BP I), bipolar II (BP II), cyclothymia, and what DSM-IV called "bipolar not otherwise specified" (BP-NOS). Much of the research on pediatric BD used the DSM-IV, so we need to start there. Researchers in the US operationalized childhood BP-NOS to include cases in which:

- The manic episode had one fewer symptom than required for a "classic" manic episode (ie, two symptoms plus elevated, or three symptoms plus irritable mood)
- The mood episode lasted at least four hours on at least four separate days, compared to "classic" episodes that require symptoms to occur on consecutive days (Birmaher B et al, *Arch Gen Psychiatry* 2006;63(2):175–183)

The multicenter COBY study recruited pediatric patients with "subsyndromal" bipolar symptoms (average age 12 years). Within five years of presentation, about 45% went on to meet full criteria for BP I or BP II, while 41% continued to meet the BP-NOS criteria. Only 14% of kids with BP-NOS showed partial or full remission within five years (Axelson DA et al, *J Am Acad Child Adolesc Psychiatry* 2011;50(10):1001–1016.e3). This broader definition of BD can capture many young people on their way to developing BP I or BP II; however, it is still up for debate whether this broader definition includes youth who are moody for other reasons. Well defined or not, BP-NOS in youth requires intervention because these children have problematic symptoms and impairment similar to youth with BP I or BP II, including suicide attempts (Towbin K et al, *J Am Acad Child Adolesc Psychiatry* 2013;52(5):466–481).

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Family history of BD is among the strongest risk factors for its development. In children with a bipolar parent (high-risk children), BPSD emerges over years, usually manifesting by the mid-20s. Kids who develop BPSD may have different symptoms at different ages, with a prodromal period preceding frank BD symptoms (Duffy A et al, *Am J Psychiatry* 2019;176(9):720–729). These include:

- Sleep and anxiety symptoms at younger ages (ages 4–10)
- Adjustment (stress sensitivity) or minor depressive disorders in early adolescence (ages 10–13)
- Major depression, psychosis, or nonresponse to SSRI (mid-late adolescence)
- Hypomanic or manic episodes (late adolescence and early adulthood)

Irritability?

Early researchers studying pediatric BD suggested that chronic, intense irritability was a form of BD in prepubertal children. However, 20 years of research have soundly demonstrated that chronic irritability is distinct from BD, and youth with chronic impairing irritability are now diagnosed with disruptive mood dysregulation disorder (Brotman MA et al, *Am J Psychiatry* 2017;174(6):520–532). Irritability can be a prominent symptom in BPSD, but in BPSD the irritability must be episodic and must be accompanied by other symptoms of mania or depression.

Prevalence in adolescents vs children

Rates of broadly defined BPSD are much higher than rates of narrowly defined BD in children and adolescents. Furthermore, BPSD is far more common in adolescents than in younger children. A meta-analysis of 19 prevalence studies, representing 56,103 subjects from 10 countries, estimated the BPSD rate among adolescents to be a whopping 8.3%, while it was only 1.7% among children under 12. Prevalence rates were similar across countries. Classic BP I in children and adolescents, however, is rare. Of 14 studies reporting on rates of BP I, four had zero cases and three found just one to two cases. The meta-analysis of all 19 studies estimated the rate of BP I to be only 0.6% among youth (Van Meter A et al, *J Clin Psychiatry* 2019;80(3):18r12180). Controversy persists around this topic, particularly regarding heterogeneity in the underlying epidemiological studies. For example, in the studies that found any BPSD in youth, rates of adolescent BPSD ranged from 1.2% to 14.3% (Parry P et al, *Int J Bipolar Disord* 2021;9(1):21). This debate goes beyond child psychiatry, as there is active discussion among adult bipolar researchers about whether current DSM definitions are too restrictive, resulting in underdiagnosis of adult BD (Parker G et al, *J Affect Disord* 2014;156:87–91). For more on diagnosing BD in adults, see *The Carlat Psychiatry Report,* Nov/Dec 2021.

Prepubertal BD: US vs global findings

There is more agreement about the emergence of BPSD in adolescence but considerable debate about BPSD in prepubertal children. Five studies of genetically high-risk children (who have one parent with BD) found no evidence of BPSD in prepubertal children (Duffy A et al, *Int J Bipolar Disord* 2020;8(1):18). In contrast, US-based researchers consistently describe BPSD in prepubertal children. Compared to other cohorts, US kids have higher rates of comorbid attention deficit hyperactivity disorder (ADHD) and other disruptive behavior disorders, and higher rates of social adversity (Birmaher B et al, *Arch Gen Psychiatry* 2009;66(3):287–296). These research differences are reflected in dramatic differences in inpatient discharge diagnosis rates of bipolar disorder, with US rates for 5- to 9-year-olds hundreds of times higher than in several other countries (Clacey J et al, *BJPsych Open* 2015;1(2):166–171).

Social inequity and trauma

Inequities due to race and class can also affect the diagnosis and treatment of BD. In the US, Black adults and adolescents with BD tend to be misdiagnosed with schizophrenia and undertreated with medication (Glassgow AE et al, *Health Equity* 2019;3(1):604–611). Economic disadvantage often results in lack of access to specialty care in the US, and this is associated with both overdiagnosis and overtreatment of BD. For example, in Kentucky, 2.4% of 6-year-olds are prescribed antipsychotics, often with a diagnosis of BD, but the diagnosis and prescriptions are usually not made by child psychiatrists (Stringaris A, *Child Adolesc Ment Health* 2019;24(1):106–107).

Social disadvantage brings childhood adversity, trauma, and psychopathology. Aggressive children with histories of trauma and social disadvantage have disruptions in mood, thought, and behavior, which contribute to overdiagnosis of BD, including in prepubertal children (Havens JF et al, *J Am Acad Child Adolesc Psychiatry* 2022;61(3):364–365). Still, childhood abuse, neglect, exposure to parental psychiatric symptoms, and attachment difficulties may all increase the risk of early onset of BPSD.

Tips for assessment

Given the complexities surrounding the definition of bipolar conditions, what tools or tips can help us sort out the diagnosis? Here are a few that we find helpful: Look at risk factors, developmental trajectories of symptoms, and substance use.

Risk factors, time course, and risk calculators

A key risk factor is family history of mood disorders and treatment. Children of parents with BD have an estimated eight- to 10-fold higher lifetime risk of developing BD than the general population (Duffy A et al, *J Clin Psychiatry* 2000;61(9):630–637). If the child has this history, BPSD is more likely. Ask about family treatment—lithium response has a genetic component.

Differentiating BPSD from ADHD, posttraumatic stress disorder, or oppositional-defiant disorder requires attention to whether symptoms occur episodically or chronically. Ask multiple informants about the time course of symptom onset and resolution. Mood rating scales or checklists can help you and your

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Q&A With the Expert

Assessing Sensory Processing Challenges

Virginia Spielmann, PhD
Sarah A. Schoen, PhD, OTR/L

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Dr. Spielmann and Dr. Schoen, experts for this educational activity, have no relevant financial relationship(s) with ineligible companies to disclose.

CCPR: Sensory processing disorder (SPD) wasn't included in the DSM-5. Tell us what happened.

Dr. Schoen: The DSM-5 committee looked at population-based studies, twin studies, neurophysiological studies, and animal research, but ultimately decided that the presentation of symptoms was not yet well enough defined to be included as a stand-alone diagnosis. They did, however, include sensory processing challenges in the section on autism and suggest that some sensory features can negatively impact autistic children.

CCPR: How do sensory processing challenges impact everyday life?

Dr. Schoen: Think about sensory processing as it relates to health and well-being, how your experience of the sensory world can interfere with everyday life. Sensory over-responsivity (SOR) is a subtype that most mental health professionals recognize and has the most face validity. Think of patients who are distressed by sensory experiences that are not typically experienced by others as aversive—this happens in children and teens with autism spectrum disorder, posttraumatic stress disorder, attention deficit hyperactivity disorder (ADHD), generalized anxiety disorder, bipolar disorder, and schizophrenia.

Dr. Spielmann: At its extreme, SOR is like being bombarded. It's disabling.

Dr. Schoen: Sensory under-responsivity is a subtype where the person does not respond to stimuli, such as how some autistic kids do not register pain. We also see individuals who are sensory craving, where a person seeks out sensory stimulation. Here, think about a child who repeatedly crashes into furniture or people, apparently in an attempt to feel their body or soothe some need.

Dr. Spielmann: Some kids have trouble with sensory discrimination, which is trouble detecting qualities within or between sensory modalities: sight, hearing, touch, smell/taste, position/movement, and internal sensation (also known as interoception). For example, kids with ADHD routinely misinterpret a neutral look as a threat, and kids with anxiety disorders might believe that a scratchy sweater is actually injuring them.

CCPR: These sensory problems must affect a child or teen's ability to respond to the world in an adaptive way.

Dr. Schoen: Yes. Motor function depends on sensory perception and processing, and so sensory processing problems can cause dyspraxia (problems with knowing what you want your body to do and with sequential motor actions). Dyspraxia is common in autism, ADHD, and developmental coordination disorder. For instance, a child on a playground might want to run for a ball but has trouble turning herself toward the ball. She can't make it there before the other kids, or maybe she knows that it's pointless to try. Either way, it's hard for her. Postural challenges also occur. Think of kids who flop over in their seats at school or fatigue easily during movement activities.

CCPR: How common are these sensory processing problems?

Dr. Schoen: About 5%–16% of the general population have sensory differences that impact function (Ahn RR et al, *Am J Occup Ther* 2004;58(3):287–293; Ben-Sasson A et al, *J Abnorm Child Psychol* 2009;37(5):705–716). Sensory differences have been reported in 80%–90% of autistic individuals and in about 40% of individuals with ADHD. But these problems can occur without a separate mental health diagnosis. Two research groups found subgroups of children with sensory differences who did not have another mental health diagnosis (Van Hulle CA et al, *J Child Psychol Psychiatry* 2012;53(1):64–72; Carter AS et al, *J Am Acad Child Adolesc Psychiatry* 2011;50(12):1210–1219).

CCPR: Are people born with these challenges, or do they develop them due to outside events?

Dr. Spielmann: Some are largely genetic, like in autism, but traumatic events can heighten sensory symptoms. There can also be epigenetic transmission of high arousal states that render a person more likely to have sensory challenges. For example, misophonia, which is an over-sensitivity to sounds, can lead to elevated autonomic arousal, characteristic of a fight-or-flight state. Either way, repeated exposure to an aversive sensory experience leads to a chronic stress state, and from that the person may develop a more sensitized stress response.

CCPR: Do you have another example of how environment can impact sensory development?

Dr. Schoen: Sure. Those car seats that snap into strollers give babies fewer opportunities for

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Expert Interview—Assessing Sensory Processing Challenges

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natural touch, smells, visual shifts, postural changes, struggling against gravity, and struggling to roll over into a prone position—all of this is important for developing sensory-motor abilities. When the baby is left in the container, she experiences limited proprioceptive and vestibular sensations from motion, and she moves only in limited directions. Later, this same child may be upset by different kinds of motion that she's never experienced. She may be unable to participate as well as her peers in activities that include more varied motion. She might avoid sensations that would help her develop greater competency, such as in playground games, swimming, or sports.

CCPR: Are there cultural or social determinants to think about with sensory processing?

Dr. Spielmann: Collective stress, such as the pandemic, increases the number of children who suffer from sensory overreactivity. This is also true for Indigenous peoples, generations exposed to conflict, and people experiencing the stresses of climate change. Children and teens from distressed groups, including people of color, may have sensory difficulties that drive difficult behavior but are more likely to be misdiagnosed as oppositional.

CCPR: How can mental health clinicians screen for sensory challenges?

Dr. Spielmann: Ask about sensory sensitivity, under-responsivity, and motor aspects of the conditions you are looking at. Take time to go through all the sensory modes—sight, hearing, touch, taste, smell—and internal sensations such as movement, position in space, and internal discomfort. Ask about over- and undersensitivity, as well as motor coordination and motor planning as it relates to challenges in daily life. Remember that there can be mixed situations where a child might talk loudly or even scream without seeming sensitive to their own volume but can't tolerate loud speech or noises around them. Part of that may have to do with their volitional control over the noise.

CCPR: Once we recognize that a client has sensory processing problems, what do we do next?

Dr. Spielmann: First, try accommodations that allow the individual to function better in varied environments. For instance, for a child who is sensitive to heat and attends a school with no air conditioning, recommend that the school use cooler spaces, place fans, or get AC. For a child with poor auditory processing, you might recommend an assisted technology assessment for an in-class amplification system where the teacher wears a transmitting microphone and the student wears a receiver headset or has a receiver box on their desk. Our website has an "About SPD" page that describes the differences in sensory integration and processing (www.sensoryhealth.org). While some difficulties can be managed with environmental accommodations, children that are not doing well should be referred for an occupational therapy assessment.

"When I explain sensory processing problems to kids, I connect their emotional experiences with what is happening for them physically. I say: 'Your body and brain are connected. When you are sad, you hear things differently and even see them differently. And when you try to do things that are usually automatic, it's like you've forgotten.'"

Sarah A. Schoen, PhD, OTR/L

Dr. Schoen: For these types of occupational therapist (OT) referrals, make sure the OT is a specialist in sensory integration and sensory processing—not all OTs do this work. The OT will perform an assessment that covers all sensory modalities and motor abilities and looks at the child's social participation and emotional regulation. The OT will determine if sensory differences are contributing to challenges in daily life activities.

CCPR: What does OT treatment for sensory challenges look like?

Dr. Schoen: OT intervention is an individualized, child-directed, play-based approach that integrates sensory-motor experiences. We help caregivers (parents and others) assist the child in being calm and regulated, and we build the child's abilities to recognize, tolerate, and interpret sensory experiences. Research shows that even in depression and anxiety, movement and stimulation of the sensory systems can be mood-elevating and regulating/calming. Parent or caregiver participation is essential for carryover into other contexts and environments.

CCPR: How effective is treatment for SPD?

Dr. Spielmann: The most popular treatment is Ayres sensory integration (www.tinyurl.com/4bjyse4a). It is recognized in the National Clearinghouse of Autism Evidence and Practice by the University of North Carolina, Chapel Hill as an evidence-based practice for autistic children ages 5–12 for improving quality of life, including relationships, play, and adaptive abilities (www.tinyurl.com/3t9e9kar; Schoen SA et al, *Autism Res* 2019;12(1):6–19). Several studies demonstrate improvement in daily life activities at home, in the community, and in school (Schoen SA et al, *Open Journal of Occupational Therapy* 2018;6(1)). We see fewer problem behaviors, greater social participation, and better play abilities in children who participate in occupational therapy (Andelin L et al, *Am J Occup Ther* 2021;75(6):7506205030; Schaaf RC et al, *Am J Occup Ther* 2018;72(1):7201190010p1–p10). Some of these children have autism or ADHD, but many have no other comorbid clinical conditions.

CCPR: How do you explain sensory processing problems to kids?

Continued on page 8

Expert Interview—Assessing Sensory Processing Challenges

Continued from page 7

Dr. Schoen: Connect their emotional experiences with what is happening for them physically. With depressed teens, you might say: "Your body and brain are connected. When you are sad, you hear things differently and even see them differently. It's like the world is harder to hear and see. And when you try to do things that are usually automatic, like get up and get dressed, it's hard to figure out how to do that—almost like you've forgotten."

CCPR: Parents often bring kids to us because of tantrums that, based on what you are saying, may be related to challenges in sensory processing. How do you explain to parents the connection between sensory challenges and behavioral outbursts?

Dr. Spielmann: We tell parents that rather than simply giving a consequence, we need to look at the reasons for difficult behaviors. Tantrums, explosive behaviors, oppositional behaviors, and demand avoidance are often linked to sensory processing. For example, some children have visual processing difficulties and become lost in their own classroom. They lose track of where the teacher is, where their class materials are, and how to get back to their seat. It takes a lot of energy for them to function in class. They come home exhausted from the effort and may have a huge meltdown.

CCPR: What resources do you recommend for parents and clinicians to understand sensory processing and integration? Also, how do we find the right OTs to refer clients to?

Dr. Spielmann: The STAR Institute website has information and resources for both clinicians and parents (www.sensoryhealth.org). The introductory pages have information that covers definitions, red flags, and research. Additionally, there is a resource directory of therapists who have attended advanced training. More resources can also be found on the Spiral Foundation website (www.thespiralfoundation.org).

CCPR: What's the bottom-line message for child psychiatrists and other mental health clinicians?

Dr. Schoen: Sensory issues are common in many mental health conditions. If you recognize and address them, the kids will do a lot better.

Dr. Spielmann: Yes, so partner with your local OTs to collaborate in the care of your patients.

CCPR: Thank you both for your time.

❖ ❖ ❖

Bipolar Spectrum Disorders in Children and Adolescents

Continued from page 5

patients consistently identify symptoms, improve diagnostic decisions, and track treatment. The Parent General Behavior Inventory (www.tinyurl.com/2cj3sawr) or the Child Mania Rating Scale (www.tinyurl.com/44r84jtz) are two examples. A good social history can identify maltreatment, trauma, or extreme adversity contributing to mood dysregulation and inform your differential diagnosis.

US researchers have developed a risk calculator that uses clinical symptoms and family risk factors to estimate the probability that a patient will meet full criteria for BD within five years; it may be used periodically to track care. This approach may motivate families to watch for symptoms and return for follow-up. The calculator is available for free at: www.cabsresearch.pitt.edu/bpriskcalculator/

Developmental course of mood symptoms

Parents often feel demoralized by the time they are in your office, often years after their child's first symptoms or after trying other ineffective treatments. Explain to parents that the shifting symptoms and lack of treatment response may be part of this complicated illness and that it can take a long time for the symptoms of BD to become clearly visible.

Co-occurring substance use

Substance use disorders (SUDs) occur in up to 33% of adolescent patients with BD, including alcohol, marijuana, and tobacco (Scavone A et al, *J Can Acad Child Adolesc Psychiatry* 2018;27(3):159–166). This combination is associated with earlier onset of BD, severe symptoms, rapid cycling, and suicidality. Assess substance use symptoms with a checklist such as CRAFFT (www.tinyurl.com/mr2wxysw). If your patient has a co-occurring SUD, treat both conditions together (see www.tinyurl.com/39mfrw4c for more information). For patients without substance use problems, talk to them and their parents about prevention strategies to avoid problem drug and alcohol use. For a good resource, see: www.tinyurl.com/5fftjfya

CARLAT VERDICT

BPSD is rare in prepubertal children, and BP I is vanishingly rare. Family history and history of adversity are as important as mania and depression. There is vigorous debate about narrow vs broad definitions of BD. With no age-based standards for "appropriate levels" of grandiosity, elation, or irritability, diagnosis of BPSD depends upon methodical assessment of symptoms, time course, episodic patterns, and family history. Manic symptoms often emerge from a developmental trajectory of symptoms, so reassess for bipolar symptoms as patients age and explain this to patients and their families.

Research Updates IN PSYCHIATRY

CATATONIA

Consider Catatonia in Your Differential

John Raiss, MD. Dr. Raiss, author of this educational activity, has no relevant financial relationship(s) with ineligible companies to disclose.

REVIEW OF: Shrivastava SVK et al, *J Child Adolesc Psychopharmacol* 2021;31(2):144–146

STUDY TYPE: Case report of Shrivastava et al, discussed by Barbara Coffey, MD

Catatonia is common in adult inpatient settings, where 6%–15% meet diagnostic criteria. In children and adolescents, prevalence estimates vary more widely, from 0.6% to 17%, perhaps because catatonia is often misdiagnosed or unrecognized. Like delirium, catatonia occurs as part of many conditions, including psychosis, mood disorders, substance use, autistic spectrum disorder, and medical conditions. Symptoms of catatonia overlap other conditions and can have opposing characteristics, although acute onset is often a tipoff. Twelve symptoms characterize catatonia, with three required to make the diagnosis. The symptoms fall into three groups: 1) absent or excess psychomotor activity: stupor, negativism, agitation; 2) absent or bizarre speech: mutism, stereotyped repetition, echolalia; 3) odd or unusual movements: catalepsy, posturing, waxy flexibility, mannerisms, stereotypic movements, grimacing, and echopraxia. The Bush-Francis Catatonia Rating Scale is a useful screening instrument (www.tinyurl.com/4yzm27nf).

Catatonia usually clears rapidly when treated with benzodiazepines or electroconvulsive therapy (see our interview with Dr. Wachtel on page 1). Antipsychotics can exacerbate catatonia and possibly lead to a severe and even life-threatening malignant catatonia, which is thought to be related to neuroleptic malignant syndrome.

M, a 12-year-old Black male, was brought to the ER by police after he hit the back door of his home and shouted at someone who was not present. Earlier that day he had briefly left his aunt's supervision to talk to friends. His urine drug screen was positive for amphetamines. He had been prescribed lisdexamfetamine 20 mg for ADHD but took it irregularly. He had once been caught with marijuana at school. He reported auditory and visual hallucinations. He anxiously paced around the unit, repeating one phrase over and over. When talking to his grandmother, he held the phone upside down, then dropped the phone receiver and walked away. He was started on risperidone 0.5 mg at night.

The next morning, M needed assistance with his personal hygiene and eating. He demonstrated waxy flexibility, mutism, and negativism, suggesting catatonia.

M received a 1 mg oral lorazepam challenge and became more engaging and responsive to instruction. Lorazepam 1 mg BID was started. He held conversations and displayed linear thought processes. Risperidone was discontinued. M was discharged the next day to outpatient care on no medication.

CARLAT TAKE

Catatonia is common. Like delirium, it is a syndrome with many possible causes. It has a good prognosis if recognized and treated with benzodiazepines, not antipsychotics. Keep it in mind, especially in acute care settings.

EATING DISORDERS

SSRIs and Hydroxyzine for Avoidant/Restrictive Food Intake Disorder (ARFID)?

Joshua Feder, MD. Dr. Feder, author of this educational activity, has no relevant financial relationship(s) with ineligible companies to disclose.

REVIEW OF: Mahr F et al, *J Child Adolesc Psychopharmacol* 2022;32(2):117–121

STUDY TYPE: Retrospective chart review

Clinicians use olanzapine, mirtazapine, and other appetite-inducing medications off label to treat ARFID, but with little research to support their use. This study unpacks the potential role of medications in treating comorbid symptoms associated with ARFID.

Researchers reviewed the charts of 53 children and teens with ARFID treated in a partial hospital program. These charts were selected because the patients were given either SSRIs only or SSRIs with hydroxyzine as part of their treatment. The group was largely pubertal females with body mass index (BMI) of 15–16. To track progress with weight gain, this study followed the percent median body mass index, or %MBMI: the patient's BMI divided by the median BMI for their age, then multiplied by 100. A typical goal is for patients to achieve a %MBMI of 90 to consider the treatment clinically meaningful.

All patients had significant anxiety. Those who took hydroxyzine in addition to SSRIs were older than those who did not (13 vs 11), were made up of fewer female patients (64% vs 92%), and had more depressive symptoms on the Child Depression Inventory (62 vs 53). All patients benefited from SSRIs, with reduced anxiety, depression, and fear of eating. Patients in both categories improved weight gain, with those on SSRIs alone experiencing a %MBMI increase from 88 to 96 over the course of a year, and those who received SSRIs + hydroxyzine up from 89 to 98 over the same period. Hydroxyzine also helped subjective fear of eating as well as nausea in the more severe cohort of patients who received both medications. Side effects included mild sedation and fatigue for hydroxyzine and headache for SSRIs.

The authors suggest starting SSRIs at 5 mg of fluoxetine (or equivalent) and titrating slowly to prevent paradoxically increasing anxiety. Hydroxyzine takes 15–30 minutes to act and peaks around two hours. The authors recommend dosing 0.5 mg/kg every four to six hours as needed for anxiety. Hydroxyzine liquid is helpful for

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Research Updates
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patients who have trouble swallowing pills.

CARLAT TAKE

While this was a small uncontrolled study of patients in a relatively high level of care, it reminds us to assess for anxiety in ARFID. Of course, we need more research, but in the meantime SSRIs may help anxiety in ARFID, and adding hydroxyzine to an SSRI may help in severe cases of ARFID with comorbid symptoms.

BIPOLAR

Pediatric Bipolar Depression: How Do We Rate a New Meta-Analysis?

Sibel Algon, MD. Dr. Algon, author of this educational activity, has no relevant financial relationship(s) with ineligible companies to disclose.

REVIEW OF: Patel RS et al, *J Child Adolesc Psychopharmacol* 2021;31(8):521–530

STUDY TYPE: Systemic review and meta-analysis

Pediatric bipolar depression (PBD) is difficult to treat (see Dr. Charuvastra's article on page 1) and often broadly defined. Currently there are only two FDA-approved medications: lurasidone and olanzapine/fluoxetine combination (OFC). In this meta-analysis, researchers sought well-designed studies of second-generation antipsychotics (SGAs) to see if there are alternatives to the currently approved treatments.

The authors reviewed randomized controlled trials comparing SGAs to placebo in youth (<20 years old) with PBD and used Children's Depression Rating Scale-Revised scores to calculate treatment response and number needed to treat (NNT). Of 569 studies, only four met complete inclusion criteria—one of OFC, one of lurasidone, and two of quetiapine—and all four were industry funded.

The meta-analysis included 826 youths with PBD who received short-term treatment (six to eight weeks) with an SGA or placebo. Only those administered lurasidone or OFC were significantly more likely than their placebo counterparts to be treatment responders. The NNT was 4.3 for lurasidone and 5.3 for OFC. A subgroup analysis found effect sizes for lurasidone treatment that were five-fold higher in older teens versus younger children (DelBello MP et al, *J Am Acad Child Adolesc Psychiatry* 2017;56(12):1015–1025). A subsequent meta-analysis of the same four trials reported that lurasidone was associated with smaller increases in weight, cholesterol, triglycerides, and prolactin compared to OFC (DelBello MP et al, *J Am Acad Child Adolesc Psychiatry* 2022;61(2):243–254). Quetiapine was not more effective than placebo for PBD.

CARLAT TAKE

While we accept that lurasidone has fewer metabolic side effects, we are wary of the other results. PBD remains a controversial diagnosis, widening the boundaries from classical bipolar disorder and likely including cases of oppositional-defiant disorder, disruptive mood dysregulation disorder, complex posttraumatic stress disorder, and borderline personality disorder. The four trials and this review come from authors who advocate for this PBD construct, and this heterogeneous mixture probably includes cases that are less responsive to SGAs. The other concern is that we have not seen the raw data, and industry-funded studies may manipulate research design. We need independent studies on treatment of classical bipolar I depression that are not industry funded to give us firmer guidance in this area. *(Editor's note: See "Reading Research: Details Matter" in* The Carlat Child Psychiatry Report, *July/Aug/Sept 2021.)*

ECT

Electroconvulsive Therapy in Adolescents and Transitional-Age Youth

Heather Goff, MD. Dr. Goff, author of this educational activity, has no relevant financial relationship(s) with ineligible companies to disclose.

REVIEW OF: Luccarelli J et al, *J Child Adol Psychopharm* 2021; 31(8):538–544

STUDY TYPE: Retrospective cohort study

Electroconvulsive therapy (ECT) is the most effective treatment available for major depression for adults, with remission rates in the range of 70%–90%. But is it as effective in adolescents? Moreover, cognitive side effects have limited the use of ECT to those with treatment-resistant depression, and the treatment is rarely used for adolescents or young adults. A recent study adds to our knowledge about efficacy and safety of ECT in a younger population.

This study included 424 patients ages 16–30 years who received ECT at a single medical center. Adolescents ages 16 and 17 made up 5.4% of the group, while 62% of the group were transitional-age youth from 18 to 25. About 64% had major depressive disorder. Other diagnoses included bipolar disorder, schizophrenia, schizoaffective disorder, and catatonia. All patients received ECT three times per week, and 95.5% had right unilateral electrode placement. Patients completed an assessment for depression (the Quick Inventory of Depressive Symptomatology-Self Report [QIDS]), an assessment of overall mental health (the Behavior and Symptom Identification Scale-24), and a cognitive screening test (the Montreal Cognitive Assessment [MoCA]) before and after the first, fifth, and 10th treatments.

After 10 treatments, the mean QIDS score for these patients dropped from 17.0 (±4.9), which is in the range of severe depression, to 10.3 (±5.4), or mild to moderate depression. All three age groups (adolescents, transitional-age youth, and adults) showed similar benefit. There was a small average reduction in the MoCA score (-1.1); however, the follow-up testing occurred only 48 hours after ECT, and ECT neurocognitive effects typically improve two to three days after treatments. The drop in cognitive scores was less than what is considered a clinically important difference during studies of adult stroke patients, and therefore may not be clinically significant in this study.

CARLAT TAKE

While the effect of ECT is more impressive in adults, this study showed reassuringly little impact of ECT on cognitive function in adolescents, transitional-age youth, and young adults. Keep ECT in mind for your adolescent and transitional-age patients with severe treatment-resistant depression.

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1. What is the estimated rate of bipolar disorder I in children and adolescents (LO #1)?
   [ ] a. 0.6% [ ] b. 1.7% [ ] c. 10.4% [ ] d. 14.4%

2. According to Dr. Wachtel, which form of therapy should be used first when treating neuroleptic malignant syndrome (LO #2)?
   [ ] a. Dopamine agonist therapy
   [ ] b. Electroconvulsive therapy (ECT)
   [ ] c. Benzodiazepine therapy
   [ ] d. Atypical antipsychotic therapy

3. What subtype of sensory processing disorder would a child who repeatedly crashes into furniture have (LO #3)?
   [ ] a. Sensory over-responsivity
   [ ] b. Sensory under-responsivity
   [ ] c. Sensory craving
   [ ] d. Sensory discrimination

4. Which intervention has been shown to worsen catatonia and can potentially lead to malignant catatonia (LO #4)?
   [ ] a. Benzodiazepines
   [ ] b. ECT
   [ ] c. Antipsychotics
   [ ] d. Benzodiazepines and antipsychotics

5. How is irritability in disruptive mood dysregulation disorder characterized (LO #1)?
   [ ] a. Chronic and not accompanied by mania
   [ ] b. Episodic and accompanied by depression
   [ ] c. Episodic and not accompanied by depression
   [ ] d. Chronic and accompanied by mania

6. What is the most common comorbid condition associated with catatonia (LO #2)?
   [ ] a. Trisomy 21 [ ] b. Velocardiofacial syndrome [ ] c. Psychotic illness [ ] d. Affective illness

7. Sensory differences only occur in individuals with another mental health diagnosis (LO #3).
   [ ] a. True [ ] b. False

8. According to a 2022 retrospective chart review of patients with avoidant/restrictive food intake disorder, what dose of hydroxyzine is recommended every four to six hours as needed for anxiety (LO #4)?
   [ ] a. 0.3 mg/kg [ ] b. 0.5 mg/kg [ ] c. 1.5 mg/kg [ ] d. 3 mg/kg

Ask the Editor

Is Silexan Safe for Children and Adolescents?

Dear Dr. Feder: *I've heard that Silexan/CalmAid lavender oil has been recommended for adults as a natural anxiolytic. Is it safe for kids?*

Dr. Feder: Lavender oil includes linalool and linalyl acetate. Together these have several central nervous system effects, including anticonvulsant, antianxiety, antidepressant, and others (Koulivand PH et al, *Evid Based Complement Alternat Med* 2013;2013:681304). The few studies we have do show that in adults, lavender oil can be helpful for generalized anxiety disorder. See "Silexan: A Novel Anxiolytic" in *The Carlat Psychiatry Report,* August 2020 for more about Silexan use in adults.

There aren't much data on the use or safety of lavender in children and teens. Lavender aromatherapy lowers dental anxiety in children, reducing pulse and respiratory rate, although the precise dosage is not clear (Gandhi H et al, *Intl J Curr Res* 2018;10(2):64956–64959). Lavender aromatherapy also reduces pulse and respiratory rate during dressing changes in child burn victims (Akgül EA et al, *Complement Ther Med* 2021;60:102758).

The most commonly reported side effect of taking lavender oil capsules is having lavender-smelling burps. Lavender oil also has both estrogenic and antiandrogenic properties, which have been associated with three reports of gynecomastia in prepubertal boys, all three of which resolved with discontinuation of lavender oil. Lavender can also interfere with arithmetic cognition and cause gastrointestinal upset. It does not seem to have abuse potential (Perry R et al, *Phytomedicine* 2012;19(8-9):825–835).

So is lavender safe to use in kids? Like all supplements, we hope for standardized regulated capsules and more robust research. In the meantime, we think that if you are careful with dosing, starting with 80 mg at night at most, and watch for the development of gynecomastia, you can safely try lavender oil to see if it helps anxiety in children and teens.

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Note From the Editor-in-Chief

If your practice is like mine, things are chaotic for our kids returning to school this fall after two distressing years. Diagnosis is more complicated, so for this issue we picked subjects that can expand your diagnostic acumen. We interviewed Dr. Lee Wachtel, who helps us recognize catatonia as a separate entity from psychosis and possibly an integral part of autism, with potentially life-saving implications. We also take on bipolar spectrum disorders, including the controversy surrounding prepubertal bipolar disorder. Our interview of Drs. Virginia Spielmann and Sarah Schoen helps us identify sensory processing challenges that can impact care across every diagnostic category. If you saw our ARFID piece this past summer, you'll appreciate the research update on medication treatment. We also cover treatment safety from lavender to ECT. I can't end without repeating the caution: Warn your patients about fentanyl, rainbow fentanyl, and now... tranq. As always, we value your feedback!

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