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anxiety disorders. A recent report of 21 children with selective mutism treated in an open trial with fluoxetine suggested that this medication may be effective for childhood selective mutism. Reports have confirmed the efficacy of fluoxetine in the treatment of adult social phobia and in at least one double-blind, placebo-controlled study using fluoxetine with children with mutism. A large NIMH-funded study of anxiety disorders in children and adolescents called Research Units in Pediatric Psychopharmacology (RUPP), has shown distinct superiority of fluvoxamine over placebo in the treatment of a variety of childhood anxiety disorders. Children with selective mutism may benefit similarly to those with social phobia given the current belief that it is a subgroup of social phobia. SSRI medications that have been shown in randomized, placebo-controlled trials to have benefit in the treatment of children with social phobia include fluoxetine (20 mg to 60 mg per day), fluvoxamine (Luvox; 50 mg to 300 mg per day), sertraline (Zoloft; 25 mg to 200 mg per day), and paroxetine (Paxil; 10 mg to 50 mg per day). REFERENCES Bergman RL, Lee JC. Selective mutism. In: Sadock BJ, Sadock VA, Ruiz P, eds. Kaplan & Sadock’s Comprehensive Textbook of Psychiatry. 9th ed. Vol. 2. Philadelphia: Lippincott Williams & Wilkins; 2009:3694. Carbone D, Schmidt LA, Cunningham CC, McHolm AE, Edison S, St. Pierre J, Boyle JH. Behavioral and socio-emotional functioning in children with selective mutism: A comparison with anxious and typically developing children across multiple informants. J Abnorm Child Psychol. 2010;38:1057–1067. Davis TE III, May A, Whiting SE. Evidence-based treatment of anxiety and phobia in children and adolescents: Current status and effects on the emotional response. Clin Psychol Rev. 2011;31:592–602. Kehle TJ, Bray MA, Theodore LA. Selective mutism. In: Bear GG, Minke KM, eds. Children’s Needs III: Development, Prevention, and Intervention. Washington DC: National Association of School

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Childhood obsessive-compulsive disorder (OCD) is characterized by recurrent intrusive thoughts associated with anxiety or fear and/or repetitive purposeful mental or behavioral actions aimed at reducing fears and tensions caused by obsessions. Data suggest that up to 25 percent of cases of OCD have their onset by 14 years of age. The overall clinical presentation of OCD in youth is similar to that in adults; however, compared to adults, children and adolescents with OCD more often do not consider their obsessional thoughts or repetitive behaviors to be unreasonable. In milder cases of OCD, a trial of cognitive-behavioral therapy (CBT) is recommended as an initial intervention. OCD in youth is often treated successfully with selective serotonin reuptake inhibitors (SSRIs) or CBT alone, or in combination. The results of a large-scale, randomized, placebo-controlled study called the Pediatric OCD Treatment Study (POTS), demonstrated that the greatest rates of remission in pediatric OCD are achieved with a combination of both serotonergic agents and CBT treatment. The American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) removed OCD from its former category of Anxiety Disorders and placed it in a new category called Obsessive-Compulsive and Related Disorders, with related disorders such as trichotillomania (hair pulling disorder), hoarding disorder, body dysmorphic disorder, and excoriation (skin picking) disorder. Nevertheless the relationship between OCD and other anxiety disorders remains significant and supported by research. EPIDEMIOLOGY OCD is common among children and adolescents, with a point prevalence of about 0.5 percent and a lifetime prevalence of 2 to 4 percent. The rate of OCD among youth rises exponentially with increasing age, with rates of 0.3 percent in children between the ages of 5 and 7 years, rising to rates between 0.6 percent and 1 percent among teens. According to the DSM-5, the prevalence of OCD in the United States is 1.2 percent, with a slightly higher rate in females. Rates of OCD among adolescents are greater than those for schizophrenia or bipolar disorder. Among young children with OCD there appears to be a slight male predominance, which diminishes with age. ETIOLOGY Genetic Factors Genetic factors have been estimated to contribute significantly to the development of OCD in early onset illness. The rate of OCD among first-degree relatives of children and adolescents who develop OCD is ten times greater than for the general population. Twin studies have shown that the concordance rates for OCD is higher for monozygotic twins (0.57) than for dizygotic twins (0.22); however, nongenetic factors play a role that may be equal to or greater than genetic contributions in some cases. OCD is a heterogeneous disorder that has been recognized for decades to run in families. In addition, the presence of subclinical symptom constellations in family members appears to breed

true. Genetic linkage studies have revealed evidence of susceptibility loci on chromosomes 1q, 3q, 6q, 7p, 9p, 10p, and 15q. The OCD collaborative genetics study found that the Sapap3 gene was associated with grooming disorders and may be a promising candidate gene for OCD. There is evidence that the glutamate receptor– modulating genes may also be associated with and play a role in the emergence of OCD. Family studies have suggested a relationship between OCD and tic disorders such as Tourette's syndrome. OCD and tic disorders are believed to share susceptibility factors, which may include both genetic and nongenetic factors. Neuroimmunology Immunological contributions to the emergence of OCD have been hypothesized to be related to an inflammatory process in the basal ganglia associated with an immune response to a systemic infection that may trigger OCD and tics. A prototype of this hypothesis has been the controversial association of OCD symptoms in a small subgroup of children and adolescents following documented exposure to or infection with group A β-hemolytic streptococcus (GABHS). Under this hypothesis, cases of infection-triggered OCD have been termed Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcus (PANDAS), and are believed to parallel an autoimmune process leading to a movement disorder much like Sydenham's chorea following rheumatic fever. Some evidence from magnetic resonance imaging (MRI) studies has documented a proportional relationship between the size of the basal ganglia and the severity of OCD symptoms in a small sample. GABHS may be one of many physiological stressors that can lead to an increase or emergence of OCD or tics; however, a prospective longitudinal study of youth with PANDAS followed over a 2-year period found no evidence of a temporal association between GABHS infections and OCD symptom exacerbations in children who met the criteria for PANDAS. The presentation of OCD in children and adolescents due to acute exposure to GABHS represents a minority of OCD cases in youth and remains controversial. Neurochemistry The evidence that SSRIs diminish symptoms of OCD, along with findings of altered sensitivity to the acute administration of 5-hydroxytryptamine (5-HT) agonists in individuals with OCD, supports the probability of serotonin's role in OCD. In addition, the dopamine system is believed to be influential in OCD, especially in light of the frequent comorbidity of OCD with tic disorders in childhood. Clinical observations have indicated that obsessions and compulsions may be exacerbated during treatment of ADHD (another frequent OCD comorbidity) with stimulant agents. Dopamine antagonists administered along with SSRIs may augment effectiveness of SSRIs in the treatment of OCD. Evidence suggests that multiple neurotransmitter systems may play a role in OCD.

Neuroimaging Both computed tomography (CT) and MRI of untreated children and adults with OCD have revealed smaller volumes of basal ganglia segments compared to normal controls. A meta-analysis of voxel-based morphometry (VBM) to assess gray matter density compared 343 OCD patients with 318 healthy controls, and found that gray matter density in OCD patients was smaller in parietofrontal cortical regions (including the supramarginal gyrus, the dorsolateral prefrontal cortex, and the orbitofrontal cortex), but larger in the basal ganglia (the putamen) and anterior prefrontal cortex compared to healthy controls. Increased gray matter volume in the basal ganglia of patients with OCD has been reported in other studies as well. These structural abnormalities in the prefrontal-basal ganglia are likely to be integrally involved in the pathophysiology of OCD. It is not clear whether the increases in gray matter in individuals with OCD occur before or after the symptoms emerge. In children, evidence suggests that thalamic volume is increased. Adult studies have provided evidence of hypermetabolism of frontal cortical-striatal-thalamocortical networks in untreated individuals with OCD. Of interest, imaging studies of before and after treatment have revealed that both medication and behavioral interventions lead to a reduction of orbit frontal and

caudate metabolic rates in children and adults with OCD. DIAGNOSIS AND CLINICAL FEATURES Children and adolescents with obsessions or compulsions are often referred for treatment due to the excessive time that they devote to their intrusive thoughts and repetitive rituals. For some children, their compulsive rituals are perceived as reasonable responses to their extreme fears and anxieties. Nevertheless, they are aware of their discomfort and inability to carry out usual daily activities in a timely manner due to the compulsions, such as getting ready to leave their homes to go to school each morning. The most commonly reported obsessions in children and adolescents include extreme fears of contamination—exposure to dirt, germs, or disease—followed by worries related to harm befalling themselves, family members, or fear of harming others due to losing control over aggressive impulses. Also commonly reported are obsessional needs for symmetry or exactness, hoarding, and excessive religious or moral concerns. Typical compulsive rituals among children and adolescents involve cleaning, checking, counting, repeating behaviors, or arranging items. Associated features in children and adolescents with OCD include avoidance, indecision, doubt, and a slowness to complete tasks. In most cases of OCD among youth, obsessions and compulsions are present. According to the DSM-5, diagnosis of OCD is identical to that of adults, with the note that young children may not be able to articulate the aims of their compulsions in diminishing their anxiety. The DSM-5 has also added the following specifiers: with good, fair, poor, or absent insight; that is, the greater the belief in the OCD obsessions and compulsions, the poorer the insight. An additional specifier indicates whether the

individual has a current or past history of a tic disorder. Table 10.1-1 designates the DSM-5 diagnostic criteria for OCD. Many children and adolescents who develop OCD have an insidious onset and may hide their symptoms as long as possible so that their rituals will not be challenged or disrupted. A minority of children, particularly males with early onset may have a rapid unfolding of multiple symptoms within a few months. OCD is commonly found to be comorbid with anxiety disorders, attention-deficit/hyperactivity disorder (ADHD), and tic disorders, especially Tourette's syndrome. Children with comorbid OCD and tic disorders are more likely to exhibit counting, arranging, or ordering compulsions and less likely to manifest excessive washing and cleaning compulsions. The high comorbidity of OCD, Tourette's syndrome, and ADHD has led investigators to postulate a common genetic vulnerability to all three of these disorders. It is important to search for comorbidity in children and adolescents with OCD so that optimal treatments can be administered. Jason, a 12-year-old boy in the sixth grade, was brought for evaluation by his parents, who expressed concerns over his repeated questions and anxiety regarding developing acquired immunodeficiency syndrome (AIDS). Jason was a highfunctioning and well-adjusted boy who abruptly began to exhibit extremely disruptive behaviors related to his fears of AIDS approximately 2 to 3 months before the evaluation. Jason's new behaviors included relentless concerns about contracting illness, washing rituals, repeated expressions of uncertainty over his own behavior, seeking reassurance, repeating rituals, and avoidance. Specifically, Jason repeatedly expressed his fear and belief that he was exposed to human immunodeficiency virus (HIV) through exposure to multiple strangers who were infected. For example, while riding in the car, if Jason saw a stranger from the window who appeared to him to be poor or ill kempt, he experienced a surge of extreme anxiety and obsessively agonized about whether the stranger could have AIDS and had exposed him to it. Despite his parents' reassurances about his safety and lack of exposure to illness, Jason insisted on vigorously washing himself for approximately one hour each time he reached home after being out. Jason continually expressed doubts about his own behavior. He often asked his parents, "Did I use the s___ word? Did I use the f___ word?" Reassurance was only

slightly calming. Jason, previously an excellent student, began to lose the ability to focus on schoolwork. While reading passages from assigned materials, Jason frequently experienced severe anxiety, wondering if he had missed a word or misunderstood the sentence, and proceeded to reread the material. Completing a page of written material began to take Jason 30 to 60 minutes. Over several weeks, he was less and less able to complete assignments, following which, he became very distressed over his deteriorating grades. During Jason's evaluation, his family history suggested that Jason's older sister had experienced a period in which she too had similar but milder anxieties, with less interference in functioning, and she had never received any treatment for those

symptoms. At the intake interview, Jason presented as a preoccupied and sad boy who was cooperative with questioning. He did not volunteer much information, and he allowed his parents to recount the extent of his symptoms. Jason believed that his relentless concerns were well founded, and that he required repeated reassurance from his parents in order to continue his daily activities. Jason met full diagnostic criteria for OCD. Symptoms of depression were present but not sufficient for major depressive disorder. CBT was initiated; however, Jason was so fearful of deviating from his rituals that he was unable to participate fully in his treatment, and he became despondent about his future. Jason refused to go to school due to his increasing distress associated with reading and his shame regarding his diminishing academic performance. Given his limited progress during the first 2 months of CBT, fluoxetine (Prozac) was added and increased up to 40 mg per day. Over a 3-week period some improvement was noted, and Jason was more amenable to cooperating with his CBT treatment. CBT and SSRI treatment was continued over the next 3 months on a regular basis. Over time, Jason finally began to show some flexibility with his rituals, and he was able to decrease the amount of time he spent with rituals. Once he had found some relief from his symptoms, Jason was able to focus more on his schoolwork and his family life. Follow-up over the next year was positive; Jason had maintained his gains from treatment, with only minimal interference from residual OCD symptoms. Jason's academic achievement improved, he was able to engage in activities with friends, and he spent almost no time preoccupied with obsessional thoughts of illness and cleansing rituals. (Adapted from a case courtesy of James T. McCracken, M.D.) Pathology and Laboratory Examination No specific laboratory measures are useful in the diagnosis of obsessive-compulsive disorder. Even when the onset of obsessions or compulsions appears to be associated with a recent infection with GABHS, antigens and antibodies to the bacteria do not indicate a causal relationship between GABHS and OCD. DIFFERENTIAL DIAGNOSIS Developmentally appropriate rituals in the play and behavior of young children should not be confused with OCD in that age group. Preschoolers often engage in ritualistic play and request a predictable routine such as bathing, reading stories, or selecting the same stuffed animal at bedtime, to promote a sense of security and comfort. These routines allay developmentally normal fears and lead to reasonable completion of daily activities. On the other hand, obsessions or compulsions are driven by extreme fears, and they significantly interfere with daily function because of the excessive time that they consume and the extreme distress that ensues when they are interrupted. The

rituals of preschoolers generally become less rigid by the time they enter grade school, and school-age children do not typically experience a surge of anxiety when they encounter small changes in their routine. Children and adolescents with generalized anxiety disorder, separation anxiety disorder, and social phobia experience intense worries that are often expressed repeatedly;

however, these are mundane compared to obsessions, which are often so extreme that they appear bizarre. A child with generalized anxiety disorder typically worries repeatedly about performance on academic examinations, whereas a child with OCD may experience repeated intrusive thoughts that he may harm someone he loves. The compulsions of OCD are not present in other anxiety disorders; however, children with autism spectrum disorders often display repetitive behaviors that may resemble OCD. In contrast with the rituals of OCD, children with autism spectrum disorder are not responding to anxiety, but are more often exhibiting stereotyped behaviors that are selfstimulating or self-comforting. Children and adolescents with tic disorders such as Tourette's syndrome may display complex repetitive compulsive behaviors similar to the compulsions seen in OCD. Children and adolescents with tic disorders, in fact, are at higher risk for the development of concurrent OCD. Severe OCD symptoms may be difficult to distinguish from delusional symptoms, especially when the obsessions and compulsions are bizarre in nature. In most adults, and often in youth with OCD, despite an inability to control their obsessions or resist completing compulsions, insight into their lack of reasonableness is preserved. That is, an individual's conviction in their beliefs often does not reach delusional intensity. When insight is present, and underlying anxiety can be described, even in the face of significant dysfunction due to bizarre obsessions and compulsion, the diagnosis of OCD is suspect. COURSE AND PROGNOSIS OCD with an onset in childhood and adolescence is most often a chronic, waxing and waning disorder with variability in severity and outcome. Follow-up studies suggest that up to 40 to 50 percent of children and adolescents recover from OCD with minimal residual symptoms. A study of childhood OCD treatment with sertraline resulted in close to 50 percent of participants experiencing complete remission, and partial remission in another 25 percent with a follow-up time of one year. Predictors of the best outcome were in those children and adolescents without comorbid disorders, including tic disorders and ADHD. A study of 142 children and adolescents with OCD followed over a period of 9 years at the Maudsley Hospital in England found 41 percent to have a persistence of OCD, with 40 percent exhibiting an additional psychiatric diagnosis at follow-up. The main predictor for persistent OCD was duration of illness at the time of initial assessment. Approximately half of the follow-up group was still receiving treatment, and half believed that they needed continued treatment. Neuropsychological functioning may also play a role in outcome and prognosis. A

study of 63 youth with OCD who completed the Rey-Osterrieth Complex Figure (ROCF) along with specific subtests of the Wechsler Intelligence Scale for Children, Third Edition (WISC-III), found that 5-minute recall accuracy from the ROCF was positively correlated with response to treatment, particularly CBT. These findings imply that poorer performance on the ROCF and poor response to CFBT may be in part due to executive functioning difficulties and that treatment may need to be modified to account for these obstacles. Overall, the prognosis is hopeful for most children and adolescents with mild to moderate OCD. In about 10 percent of cases, OCD may represent a prodrome of a psychotic disorder in children and adolescents. In youth with subthreshold OCD symptoms, there is a high risk of developing of the full OCD disorder within a period of 2 years. Childhood OCD has been shown to be responsive to available treatments, resulting in improvement, if not complete remission, in the majority of cases.

TREATMENT CBT and SSRIs have both been shown to be efficacious treatments for OCD in youth. CBT geared toward children of varying ages is based on the principle of developmentally appropriate exposure to the feared stimuli coupled with response prevention, leading to diminishing anxiety over time on exposure to feared situations. CBT manuals have been developed

to ensure that developmentally appropriate interventions are made and that comprehensive education is provided to the child and parents. Treatment guidelines for children and adolescents with mild to moderate OCD recommend a trial of CBT prior to initiating medication. However, the Pediatric OCD Treatment Study (POTS), a multi-site National Institute of Health (NIH)–funded investigation of sertraline and CBT each alone, and in combination, for the treatment of childhood-onset OCD, revealed that the combination was superior to either treatment alone. Each treatment alone also provided encouraging levels of response. Mean daily dose of sertraline was 133 mg/day in the group administered the combination treatment, and 170 mg/day for the sertraline alone group. Improvement with pharmacologic intervention of childhood OCD usually occurs within 8 to 12 weeks of treatment. Most children and adolescents who experienced a remission with acute treatment using SSRIs were still responsive over a period of a year. Among youth with OCD who obtain partial response to a therapeutic trial of SSRI treatment, augmentation with a short-term OCD-specific CBT leads to a significantly greater response. Evidence shows that higher treatment expectations by patients and families are linked to better treatment response, greater compliance with home-based CBT assignments, less drop out of treatment, and reduced impairment. In addition to individual CBT, both family and group CBT interventions have been shown to be efficacious in the treatment of childhood OCD. Family CBT (FCBT) intervention in the treatment of OCD in youth has been shown to increase response rates. A controlled comparison of family CBT and psychoeducation and relaxation (PRT) in 71 families of children with OCD showed that clinical remission rates in the FCBT group were significantly higher than those in the PRT group. The FCBT treatment reduced parent involvement and accommodation in their affected child’s symptoms, which led to decreased symptomatology. A randomized controlled study investigating web-camera delivered FCBT (W-CBT) compared to a waitlist condition assigned 31 families to one of the above conditions. Assessments were conducted immediately before and after treatment and at 3-month follow-up for the W-CBT group. The W-CBT group was superior to the waitlist control group on all primary outcome measures, with large effect sizes. Eighty-one percent of the W-CBT group responded compared to 13% of the waitlist group. The gains were maintained at the 3-month follow-up assessment. The authors conclude that W-CBT may be efficacious in the treatment of OCD in youth and may be a promising tool for future dissemination.

Exposure and response prevention (ERP), a common strategy within CBT already shown to be effective on an individual basis for OCD, was studied in a group format in youth with OCD in a community-based program. Group-based ERP was found to be effective in reducing OCD symptom severity and depressive symptoms, but not anxiety symptoms, in a naturalistic treatment setting for children with OCD and comorbid anxiety and/or depressive features. Robust evidence of SSRI efficacy for OCD in youth has been shown through multiple randomized clinical trials. A meta-analysis of 13 studies of SSRIs, including sertraline, fluvoxamine, fluoxetine, and paroxetine have provided evidence of efficacy of SSRIs with a moderate effect size. A randomized controlled clinical trial of citalopram versus fluoxetine in youth with OCD found that citalopram was as safe and effective as fluoxetine for the treatment of OCD in children and adolescents. There have been no apparent differences in the rate of response for the individual SSRIs. Currently, three SSRIs: sertraline (at least 6 years), fluoxetine (at least 7 years), and fluvoxamine (at least 8 years), as well another as clomipramine (at least 10 years), have received Food and Drug Administration (FDA) approval for the treatment of OCD in youth. The black box warning for antidepressants used in children for any disorder, including OCD is applicable, so that close monitoring for suicidal ideation or behavior is mandated when these agents are used in the treatment of childhood OCD. Typical

side effects that emerge with the use of SSRIs include insomnia, nausea, agitation, tremor, and fatigue. Dosage ranges for the various SSRIs found to have efficacy in randomized clinical trials are the following: fluoxetine (20 mg to 60 mg), sertraline (50 mg to 200 mg), fluvoxamine (up to 200 mg), and paroxetine (up to 50 mg). Clomipramine was the first antidepressant studied in the treatment of OCD in childhood and the only tricyclic antidepressant that has FDA approval for the treatment of anxiety disorders in childhood. Clomipramine was found to be efficacious in doses up to 200 mg, or 3 mg/kg, whichever is less, and may be chosen for children or adolescents who cannot tolerate other SSRIs due to insomnia, significant appetite suppression, or activation. Nevertheless, clomipramine is not recommended as a first-line treatment due to its greater potential risks compared to other SSRIs, including cardiovascular risk of hypotension and arrhythmia, and seizure risk. Pediatric patients with OCD who respond only partially to medications tend to have at least moderate to severe OCD symptoms, high ratings of global impairment and significant comorbidity even after their partial response to an adequate trial of medication. Augmentation strategies with medications to enhance serotonergic effects, such as with atypical antipsychotics (e.g., risperidone) have demonstrated increased response when partial response has been achieved with SSRIs. Aripiprazole augmentation in 39 adolescents with OCD who did not respond to two trials of monotherapy with SSRIs led to 59 percent of patients being rated as improved or very much improved. Patients who responded to aripiprazole were less impaired at baseline in functional impairment but not in clinical severity of their OCD. Aripiprazole final mean dose was 12.2 mg per day. This agent may be effective for pediatric OCD and

warrants further controlled trials. Given the lack of data on discontinuation, recommendations for maintaining medication such as stabilization, education about relapse risk, and tapering medication during the summer are likely in order to minimize academic compromise in case of relapse. For children and adolescents with more severe or multiple episodes of significant exacerbation of symptoms, treatment for more than a year is recommended. Overall, efficacy of treatment for children and adolescents with OCD is high with choices of SSRIs and CBT. REFERENCES Alaghband-Rad J, Hakimshooshtary M. A randomized controlled clinical trial of citalopram versus fluoxetine in children and adolescents with obsessive-compulsive disorder (OCD). Eur Child Adolesc Psychiatry. 2009;18:131–135. American Academy of Child and Adolescent Psychiatry. Practice parameter for the assessment and treatment of children and adolescent with obsessive-compulsive disorder. J Am Acad Child Adolesc Psychiatry. 2012;51:98–113. Bienvenu OJ, Wany Y, Shugart YY, Welch JM, Fyer AJ, Rauch SL, McCracken JT, Rasmussen SA, Murphy DL, Cullen B, Valle D, Hoen-Saric R, Greenberg BD, Pinto A, Knowles JA, Piacentini J, Pauls DL, Liang KY, Willour VL, Riddle M, Samuels JF, Feng G, Nestadt G. Sapap3 and pathological grooming in humans: Results from the OCD collaborative genetics study. Am J Med Genet B Neuropsychiatry Genet. 2009;150B:710–720. Flessner CA, Allgair A, Garcia A, Freeman J, Sapyta J, Franklin ME, Foa E, March J. The impact of neuropsychological functioning on treatment outcome in pediatric obsessive-compulsive disorder. Depress Anxiety. 2010;27:365–371. Franklin ME, Sapyta J, Freeman JB, Khanna M, Compton S, Almirall D. Moore P, Choate-Summers M, Garcia A, Edson AL, Foa EB, March JS. Cognitive behavior therapy augmentation of pharmacotherapy in pediatric obsessive-compulsive disorder: The Pediatric OCD Treatment Study II (POTS II) randomized controlled trial. JAMA. 2011;306:1224–1232. Freeman J, Sapyta J, Garcia A, Fitzgerald D, Khanna M, Choate-Summers M, Moore P, Chrisman A, Haff N, Naeem A, March J, Franklin M. Still struggling: Characteristics of youth with OCD who are partial responders to medication treatment. Child Psychiatry Hum Dev. 2011;42:424–441. Leckman JF, King RA, Gilbert DL, Coffey BJ, Singer HS, Dure LS 4th, Grantz H, Katsovich L, Lin H, Lombroso PJ, Kawikova I, Johnson DR, Kurlan RM, Kaplan EL. Streptococcal upper respiratory tract infections and

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