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## Practice Parameters for the Assessment and Treatment of Children and Adolescents With Obsessive-compulsive Disorder

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### ABSTRACT

These practice parameters describe the assessment and treatment of obsessive-compulsive disorder based on a detailed literature review and expert consultation. Obsessive compulsive disorder is a disorder of heterogeneous origin characterized by intrusive thoughts or compulsive urges or behaviors that are distressing, time-consuming, or functionally impairing. In children and adolescents, the disorder often is accompanied by a wide range of comorbidity, including mood, anxiety, attention, and learning difficulties, and/or tic disorder. These parameters describe the relevant areas of assessment, especially symptomatology, onset and course, other associated psychopathology, and developmental, family, and medical history (including post-infectious onset or exacerbations). Only two modalities have been systematically assessed and empirically shown to ameliorate core symptoms: cognitive behavioral therapy (primarily exposure/response prevention) and serotonin re-uptake inhibitor medication. Data regarding the indications, efficacy, and implementation of these modalities are reviewed. Because of the frequent co-occurrence of other psychopathology and adaptive difficulties, additional educational, individual and family psychotherapeutic, and pharmacological interventions often are necessary. Treatment planning guidelines are provided. **Key Words:** children, adolescents, obsessive, compulsive, anxiety, tic, cognitive, behavioral, serotonin, practice parameters, guidelines.

Obsessions are persistently recurring thoughts, impulses, or images that are experienced as intrusive, inappropriate, and distressing and that are not simply excessive worries about realistic problems (American Psychiatric Association [APA], 1994). Compulsions are repetitive behaviors or mental acts that a person feels driven to perform according to a rigidly applied rule

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in order to reduce distress or to prevent some dreaded outcome (albeit one not realistically related to the action). The *DSM-IV* criteria for obsessive-compulsive disorder (OCD) require that the presence of obsessions or compulsions causes impairment in terms of marked distress, time consumed (more than 1 hour per day), or significant interference with daily routine or academic or social functioning.

### LITERATURE REVIEW

Index Medicus was searched in the fall of 1996 for articles published during the previous 10 years on serotonin-reuptake inhibitors, the pharmacotherapy of OCD, and childhood OCD (Leonard et al., 1997; March and Leonard, 1996). The search was updated in December 1997. *Medline*, *Psychlit*, and the Obsessive-Compulsive Information Center at the Dean Foundation in Madison, Wisconsin were searched for published and unpublished reports applying cognitive-behavioral principles and therapies to OCD in children and adolescents (March, 1995) and these searches also were updated. Data from the Expert Consensus Panel for Obsessive-Compulsive Disorder (March et al., 1997a) was reviewed with particular attention to recommendations concerning children and adolescents. Reference lists of selected articles were scanned for more recent or omitted articles. The authors also drew on their own clinical experience.

### EPIDEMIOLOGY

Estimates of the prevalence of OCD in adolescent community samples range from 1.0% to 3.6% (Apter et al., 1996; Flament et al., 1988; Valleni-Basile et al., 1994; Zohar et al. 1992). Although comparative data are scant, epidemiological studies do not find significant differences among ethnic groups in the United States in the prevalence of child and adolescent OCD (Costello et al., 1996; Valleni-Basile et al., 1994).

A potential difficulty in assessing the prevalence of OCD in community samples is the need to distinguish OCD from the broad range of mild rituals and obsessions that occur as common experiences throughout the life span and as developmental phenomena in toddlerhood (Evans et al., 1997; Leonard et al., 1990). Comparing adult patients with OCD to non-clinical subjects, Rachman and de Silva (1978) found that both groups' obsessions were similar in form and content, but differed significantly in frequency, intensity, and consequences. Compared to the obsessions of patients with OCD, those of non-clinical subjects were rarer, briefer, and more easily dismissed, as well as less vivid, less ego-alien and discomforting, and less likely to provoke efforts at neutralization or to be accompanied by compulsive acts. As discussed below, assessment of each of these dimensions is an important aspect of the clinical evaluation of patients with possible obsessions or compulsions.

Mild or transient obsessions and compulsions are common in the general population. In a community sample of 861 Israeli adolescents aged 16 years, Apter et al. (1996) found that although lifetime prevalence of OCD was only 2.3%, the lifetime prevalence for various self-reported obsessive-compulsive (OC) symptoms were relatively high: intrusive images (6%); disturbing thoughts (8%); hoarding (29%); repetitive actions (27%); urges to repeat (30%); ritualized routines (34%); orderliness (49%); and extreme neatness (72%). However, while 20%

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of subjects reporting such symptoms regarded them as senseless and 8% reported spending more than 1 hour daily on them, only 3.5% regarded them as usually or always distressing. Flament and colleagues' (1998) epidemiology study illustrated the difficulty of measuring OCD in the general population, including the limits of current diagnostic criteria.

Recognizing that obsessions and compulsions occur with a wide range of severity and impairment, the term "subclinical OCD" has been used to describe subjects reporting substantial obsessions or compulsions not severe enough to meet the full OCD criteria. Depending on the definition used, prevalence estimates of "subclinical OCD" in adolescence in the samples cited above range from 4.0% through 19% (Apter et al., 1996; Flament et al., 1988; Valleni-Basile et al., 1994, 1996; Zohar et al., 1992). The wide range of definitions used for this condition limit the conclusions that can be drawn comparing these studies.

As with adults, estimates of the frequency of OCD in clinical samples of children are generally lower than those found in community samples and range from 1.3% to 5% (Honjo et al., 1989; Thomsen and Mikkelsen, 1991). This discrepancy, which suggests that many individuals with OCD do not come to clinical attention, may be due to secretiveness about symptoms or lack of awareness about the disorder and the availability of treatment. There is some evidence that with increased professional and public awareness about OCD, clinical diagnosis of the disorder has become more frequent (Stoll et al., 1992).

The natural history of childhood OCD is not well studied. Retrospective reports of adult patients with OCD suggest that about 1/3 to 1/2 had onset of first symptoms before age 15 (Pauls et al., 1995). The onset of OCD may occur early in life, with reports as young as age 5 years, with a mean age of onset in children and adolescents in clinical samples of 10 years, ranging from 7 to 12 years (Geller et al., 1996; Hanna et al., 1995; Honjo et al., 1989; Riddle et al., 1990; Swedo et al., 1989a; Thomsen and Mikkelsen, 1991). Boys may be more likely to have a prepubescent onset, whereas girls may have a pubertal or adolescent onset. Most studies note a male predominance in children (3:2), with the gender distribution becoming more equal in adolescence (Swedo et al., 1989a). Cases with early onset are more likely to be familial than those with later onset (Pauls et al., 1995). Boys, especially those with a pre-pubertal onset, also are more likely than girls to have a tic disorder (Leonard et al., 1992; Pauls et al., 1995). In contrast, studies of adults with OCD report a mean onset of illness at age 21 years and a fairly equal gender distribution (or a slight female preponderance) (Rasmussen and Eisen, 1992). Several factors may explain the difference in age of onset and gender distribution between children and adults, including a bimodal (or trimodal) distribution of age of onset, and the sampling of the subjects for the studies (the boys with early onset may not be as represented in the adult ascertained reports).

Early clinical studies of childhood OCD, conducted for the most part prior to the development of specific therapies such as cognitive-behavioral therapy (CBT) or serotonin reuptake inhibition, suggested that the condition was often chronic, with 47% to 70% still symptomatic after several years (Bolton et al., 1983; Hollingsworth et al., 1980). At follow-up 2 to 7 years later, out of a sample of 54 children and adolescents who received treatment with clomipramine (CMI), only 6% could be considered in true remission; 43% still met criteria for OCD, and 70% were taking psychoactive medication. Worse OCD outcome was associated with

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lifetime history of tic disorder or presence of a parental *DSM* Axis I psychiatric diagnosis (Leonard et al., 1993).

In epidemiological studies of non-referred adolescents with OCD, the disorder also appears to be persistent. A 2-year prospective follow-up of a high school sample surveyed for OC symptoms and traits found that of those adolescents initially diagnosed with OCD, one-third still met criteria for OCD and another 55% qualified for a diagnosis of either subclinical OCD, OC personality, or another psychiatric disorder with OC features. Only 12% no longer qualified for any OC diagnosis. At follow-up, one-quarter of the subjects initially diagnosed as having subclinical OCD or OC personality met the full criteria for OCD (Berg et al., 1989; Flament et al., 1990). This fluidity of diagnosis in individuals over time suggests the limitations of current nosology of these disorders as defined in *DSM-IV*. At 12 to 18 month follow-up of a group of unreferred, epidemiologically ascertained untreated adolescents with OCD, Zohar et al. (submitted) found that of those initially diagnosed with OCD, only 11% showed complete remission. Despite some divergence in estimates of remission rates, these studies suggest that adolescent OCD and even subclinical OCD are often accompanied by persistent functional difficulties (Valleni-Basile et al., 1996; Zohar et al. 1992, submitted).

### CLINICAL PRESENTATION

Children and adolescents with OCD appear to represent a heterogeneous group with a wide range of clinical presentations and course. The content of a given child's obsessive or compulsive symptom often varies over time and hence does not provide a simple key to defining distinctive subtypes (see section on tic disorder for discussion of symptom subtypes). For example, Rettew and colleagues (1992) followed the individual OCD symptoms of 79 children and adolescents with OCD during an average of 7.9 years (range 2 to 16 years) and found no relationship between the number or type of OCD symptoms and age. Surprisingly, most patients' symptoms varied over time and most endorsed all of the common symptoms at some point.

Systematic phenomenological studies also find heterogeneity in the onset and course of children's illness (Riddle et al., 1990; Swedo et al., 1989a). For example, children with OCD vary in type of onset (abrupt vs. insidious, precipitating trigger event vs. none); course of illness (chronic with some fluctuations vs. severe exacerbations with remissions); age of onset (prepubescent vs. pubertal); comorbid diagnoses; and accompanying neurological abnormalities (e.g. choreiform movements). Ongoing studies are examining whether these putative subtypes are associated with distinctive patterns of etiology or treatment response.

### SYMPTOM TYPES

The most common symptoms of OCD in childhood are obsessive contamination fears, often accompanied by protracted or ritualized compulsive washing and avoidance of "contaminated objects" (Riddle et al., 1990; Swedo et al., 1989a), leading to increasing constriction of activities. The feared contaminants may be as specific as AIDS or semen or as vague as something "sticky" or "dirty." An obsessive worry about safety, usually of parents or themselves, is common.

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Compulsive repetitive checking (for example, that doors are locked or that family members are safe) is another common symptom. Checking may be a manifestation of a more general pattern of obsessive doubting that compels the child to make sure that, for example, he or she didn't hurt someone's feelings, or run over an animal with a bike. Such children may plague their parents with confessions of imagined misdeeds or bad thoughts and requests for repeated reassurance regarding the dangers of potentially contaminated objects. In some children, compulsivity may take a religious cast with repetitive praying or worries about imagined sins (scrupulosity).

Other common compulsions include repetitive counting, arranging, or touching in patterns. Although some compulsions may be tied to a specific worry, many compulsions consist of actions repeated until they feel "just right" (e.g., children may repetitively go back and forth through a door, or up and down stairs until they "get it right.") The elusive sense of closure or completion that the patient seeks may require symmetry (e.g., repeating with the left hand actions done with the right, or evening up shoe lace length and tension) or repeating actions odd or even numbers of times. Compulsive re-reading or re-writing school assignments may interfere with academic performance. Mental rituals may consist of silent praying, repetition, counting, or having to think about or look at something in a particular way until it feels just right. @

Unlike many adults, children with OCD may be unable to specify the dread consequences their compulsive rituals are intended to avert, beyond a vague premonition of something bad happening (Swedo et al., 1989a). Simple compulsions, such as repetitive or symmetrical touching, may lack a discernable ideational component and may be phenomenologically indistinguishable from complex tics (Cohen and Leckman, 1994; Leckman et al., 1993).

A minority of children with OCD suffer from pure obsessions without any accompanying compulsive behaviors or mental acts. These intrusive, often disturbing thoughts or images may be sexual, aggressive, or self-injurious in content. Obsessional slowness is a less common, but frequently disabling, presentation in which an adolescent moves dramatically slowly. Careful assessment often reveals preoccupation with multiple mental rituals that interfere profoundly with normal activities.

A common feature of many obsessive worries is an exaggerated perception of risk on the part of the child that is decreased by the compulsive ritual. Although many children describe their obsessional thoughts as appearing "out of the blue," careful review reveals that many such thoughts are triggered by external cues. For example, a child's contamination fears may occur when near a certain person or object. The child may acknowledge that the person or object may not, in fact, be contaminated, but, once stimulated, the distressing thought is difficult to dislodge and leads to an urge to wash or to avoid the object. The performance of the ritual transiently reduces the obsessional worry, albeit at the potential cost of increasing impairment and constriction of functioning.

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### CO-MORBIDITY

Although OCD in children and adolescents may occur without significant co-morbidity, obsessions and compulsions often are accompanied by other symptoms with important implications for clinical assessment, differential diagnosis, and treatment. The frequent association between OCD and subclinical OCD on the one hand, and co-morbid anxiety, tic, mood, and/or attention problems and cognitive and adaptation difficulties on the other, is found in community samples (Apter et al., submitted), as well as in clinical subjects (Flament et al., 1990; Geller et al., 1996; Riddle et al., 1990; Swedo et al., 1989a) indicating that it is not merely an artifact of referral bias (Berkson, 1946). First-degree relatives of juvenile OCD probands also show high rates of mood disorder, anxiety disorders, OCD, attention-deficit/hyperactivity disorder (ADHD), and tic disorder (Geller et al., 1996; Lenane et al., 1990).

#### Anxiety and Mood Disorders

As many as 1/3 to 1/2 of children with OCD have a current or past history of another anxiety disorder. Overanxious and separation anxiety disorders appear to be common (Geller et al., 1996; Swedo et al., 1989a). Depression is another common comorbid condition, with the prevalence of comorbid mood disorder ranging from 20% to 73% (Flament et al., 1990; Geller et al., 1996).

#### Tic Disorder

At least 50% of children and adolescents with Tourette's disorder develop OC symptoms or disorder by adulthood (Leckman, 1993). The elevated rates of OCD in the first-degree relatives of probands with Tourette's disorder, including those relatives who do not themselves have Tourette's disorder, suggest that at least one form of OCD may be an alternative phenotypic expression of the putative gene for Tourette's disorder (Pauls et al., 1991, 1995). Conversely, a personal or family history of tics is found in a substantial number of children with OCD. Followed over time, nearly 60% of children and adolescents seeking treatment for OCD prove to have a lifetime history of tics that ranged across subjects from simple, mild, and transient tics through Tourette's disorder (Leonard et al., 1992).

Various attempts have been made to delineate subtypes of OCD (Eapen et al., 1997). Recent research suggests that the distinction between Tic-related OCD and Tic-unrelated OCD may be a useful one. These studies suggest that OCD occurring in the context of a personal or family history of tics may differ from OCD occurring in the absence of such a history in terms of clinical phenomenology, neurobiological concomitants, and responsiveness to pharmacological interventions (Leckman et al., 1997, in press). Despite considerable overlap, these two putative subtypes of OCD appear to differ in gender ratio, age of onset, and the number and nature, but not severity, of OCD symptoms. Others have described these subtypes as early (prepubescent) and later (pubertal) onset. The early onset OCD children appear to have a higher rate of comorbid tic disorder. Thus, these two approaches to subtype may be convergent (Swedo et al., in press).

Tic-related childhood-onset OCD appears to have earlier onset and to occur more frequently in boys than girls (Leonard et al., 1992; Pauls et al., 1995). The need to touch or rub,

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blinking and staring rituals, worries over symmetry and exactness, a sense of incompleteness, and intrusive aggressive thoughts and images are significantly more common in OCD patients with comorbid tics than in the non-tic-related group (Holzer et al., 1994; Leckman et al., 1995, 1997, in press; Zohar et al., 1997). In contrast, contamination worries and cleaning compulsions are more common in patients with nonTic-related OCD. Factor analytic studies of OCD symptoms yield three or four distinctive factors (Baer, 1994; Leckman et al., 1997). One factor, which includes symmetry, hoarding, ordering, repeating, counting, and touching compulsions, is associated with a high relative risk for comorbid tic disorder. A second factor, consisting of contamination worries and cleaning and checking compulsions, appears unrelated to the subjects' tic status. The subjective sensations accompanying symptoms also may distinguish between these two subtypes. Patients with nonTic-related OCD often describe their compulsions and rituals as accompanied by obsessive worries and anxiety (George et al., 1993; Miguel et al., 1995) while patients with tic-related OCD frequently report the need to perform a compulsive act "just right" (Leckman et al., 1994, 1995). Finally, these two putative sub-types of OCD may differ in their responsiveness to pharmacotherapy, with subjects with tic-related OCD apparently having a generally less satisfactory response to treatment with a selective serotonin reuptake inhibitor (SSRI) alone (McDougle et al., 1994a).

Although findings regarding the significance of potential subtypes of OCD remain to be confirmed and extended, they suggest the clinical importance of a careful assessment for a family or personal history of tics.

### Temperamental, Regulatory, and Neuropsychological Difficulties

Temperamental and neuropsychological difficulties may be seen in children with OCD. Some children with OCD are described by parents as having been somewhat anxious and perfectionistic all of their life, whereas others are not. Most children with OCD are not especially neat, overly compliant, or attentive to detail outside the context of their symptoms. Indeed, some may be irritable or impulsive and as many as half may meet criteria for a disruptive behavior disorder, such as ADHD or oppositional-defiant disorder (Geller et al., 1996). Perfectionism and disorganization may thus co-exist. In children with OCD who are prone to obstinate struggles, it may be difficult to determine the relative mix of oppositional-defiance vs. compulsiveness. Otherwise previously well-behaved children may become irascible, defiant, demanding, even assaultive, in the desperate need to perform their compulsions.

Retrospective studies suggest that disruptive behavior symptoms may predate the onset of OCD (Flament et al., 1985, 1990; Swedo et al., 1989a). For example, Geller et al. (1996) found that 33% of a sample of juvenile OCD patients also met criteria for ADHD and 43% met criteria for oppositional-defiant disorder. However, the mean ages of onset were before age 2 years for ADHD and age 7.1 years for oppositional-defiant disorder, hence typically predating the appearance of OCD at mean age of 8.5 years. Clinically it sometimes appears that symptoms of irritability, impulsivity, and impaired concentration may fluctuate with the acute severity of OCD symptoms and improve with remission of OCD symptoms. A significant proportion of children and adults with OCD show impairment of visual-motor integration, visual memory, and executive functioning (Behar et al., 1984; Head et al., 1989; Hollander et al., 1990, 1993; Hymas et al., 1990). Determining the clinical, behavioral, and educational implications of these deficits

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and whether they represent stable traits or chronic attention-deficit or learning impairments, independent of current OCD symptom status, requires further research.

### Pervasive Developmental Disorders

Children with pervasive developmental disorders (PDD) (such as autism, Asperger's disorder, and related disorders) often manifest stereotypic behaviors and routines, as well as unusual preoccupations and fixed interests (e.g., motors, electric fans, maps, numbers) that parents or teachers may describe as "obsessive-compulsive" (Cohen and Volkmar, 1997; King and Noshpitz, 1991). The cognitive and language difficulties characteristic of PDD frequently make it difficult to assess the extent to which the child regards these preoccupations and repetitive behaviors as intrusive, excessive, or problematic. Despite being a source of functional impairment or disturbing to others, in children with PDD these symptoms generally do not cause distress to the child. Moreover, such children's rigid insistence on routines usually occurs in the context of a more general difficulty with transitions and demand for sameness. Nonetheless, the OC symptoms of children with PDD appear to share important common features with uncomplicated OCD, including high rates of OCD in first-degree probands (Bailey, 1996) and potential responsiveness to SSRIs (McDougle et al., 1994b, 1995, 1996).

A large number of children with poor social relatedness; cognitive unevenness; dysregulation of mood, anxiety, and attention; and low frustration tolerance do not fall readily into any single diagnostic category and have been classified under such diverse rubrics as Amultiplex developmental disorder@ (Towbin, 1997), Aborderline@ (King and Noshpitz, 1991), Atypical development,@ Aschizoid,@ (Wolff and Barlow, 1979), "obsessive difficult temperament" (Garland and Weiss, 1996), or Aregulatory disorder.@ Many of these children do not meet the full criteria for OCD, but are irritable, preservative, over-focused on specific areas of interest or concern, unable to shift tasks easily, and insistent that certain things be done "just right," with intense upset resulting if thwarted. The relationship of this symptom picture to OCD, PDD, and conditions such as non-verbal learning disorder (Rourke, 1987) remains to be clarified. Controlled trials are needed to assess the potential responsiveness of such symptoms to anti-obsessional medication.

### Trichotillomania

Trichotillomania, defined as persistent hair pulling to the point of alopecia, has both similarities and differences with OCD, leading to speculation that this repetitive behavior is an "obsessive-compulsive spectrum disorder" (Swedo, 1993). Trichotillomania also can have an early-onset form, appearing as early as the toddler years. Although the frequency of OCD appears to be increased among children and adolescents with trichotillomania and their first-degree relatives, most youngsters with this potentially cosmetically disfiguring condition do not have other obsessive or compulsive symptoms (Hanna, 1997; King et al., 1995 a,b; Lenane et al., 1992; Swedo, 1993).

### Other Psychiatric Conditions

OC symptoms and disorder are common in patients with anorexia nervosa or bulimia nervosa. Symptoms are not limited to concerns about food, weight, body image, or exercise, but



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may extend to the full range of obsessions and compulsions including symmetry, pathological doubting, contamination, counting, checking, and ordering (Thiel et al., 1995).

Body dysmorphic disorder is characterized by obsessional preoccupation with an imagined or slight defect in appearance, often accompanied by compulsive behaviors such as excessive mirror checking and grooming (Phillips et al., 1995). The relationship of this disorder to OCD is not clear.

Children with OCD can act in bizarre ways, show near-delusional tenacity in their conviction of potential unrealistic dangers or the necessity of performing rituals, and have a dramatic deterioration in adaptive functioning. These features occasionally raise the question of psychotic or schizophrenic deterioration. In most childhood cases of OCD, however, the absence of thought disorder or hallucinations and the preservation of reality testing outside the area of obsessional concern help distinguish symptoms from those of psychosis. In general, the presence of psychosis appears to be rare and not typically reported in most studies. However, although psychosis has been an exclusion criteria in many clinical research samples of juvenile OCD, Geller et al. (1996) discerned psychotic features in up to 30% of one sample; much of this co-morbidity was regarded by the authors as a correlate of mania. These results remain to be replicated.

Schizophrenia also can co-occur with OCD (Fenton and McGlashan, 1986) and must be considered as part of the differential diagnosis in older children and adolescents with psychotic features. In adult patients with OCD, the *DSM-IV* modifier has been used to describe individuals who do not meet the diagnostic criterion of recognizing the excessive or unreasonable nature of their obsessions or compulsions. However, the *DSM-IV* criteria for OCD explicitly exempts children from this criterion and the concept of *Delusional OCD* (Eisen and Rasmussen, 1993) has not been extended systematically to the pediatric age group.

### Medical Conditions

OCD may occur as a consequence of various neurological conditions and has been reported to occur with carbon monoxide poisoning, tumors, allergic reactions to wasp sting, post-viral encephalitis, traumatic brain injury, Sydenham's chorea, and a host of other basal ganglia pathologies (Wise and Rapoport, 1989). OCD including, but not limited to, compulsive eating and preoccupation with food also has been found in at least 50% of children with Prader-Willi syndrome, a genetic condition resulting from deletion of a portion of chromosome 15 (Dykens et al., 1996).

*Medication Side Effects.* In animal studies, dopamine agonists can induce repetitive stereotypic behaviors. In children, stimulants in high doses can transiently induce over-focused, preservative, or driven compulsive behaviors (Borcharding et al., 1990; Solanto and Wender, 1989). Despite this potential side effect, however, stimulants have been used in children with OCD and concomitant ADHD (without a history of tics) without apparently exacerbating their OCD symptom.

*Post-infectious Conditions.* A finding of potentially wider significance is that the incidence of OCD is increased in children with Sydenham's chorea (SC) (Swedo et al., 1989b). Parallel lines of investigation of children with OCD and children with SC suggest that SC may serve as model of pathogenesis for certain forms of OCD (Mercandante et al., 1997; Swedo,

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1994; Swedo et al., 1989b; Swedo et al., 1993,1994). Sydenham's chorea is the neurological variant of rheumatic fever (RF) and is a response to a Group A beta-hemolytic streptococcal (GABHS) infection. The illness is hypothesized to result from autoimmune response in genetically vulnerable individuals and may be caused by misdirected antibodies or other immune mechanisms toward regions of the basal ganglia. Neurological and psychiatric studies of children with SC have found such children developing acute onset OCD as part of the SC syndrome, with resolution of the OCD paralleling that of the SC (Mercandante et al., 1997; Swedo et al., 1993). Dramatic and acute changes in personality, characterized by irritability, emotional lability, and separation anxiety, also have been noted. This model suggests that acquired basal ganglia dysfunction might give rise to a variety of symptoms, including chorea, tics, obsessions, and compulsions. Similarly, studies of children with OCD and/or tic disorder have noted that some children develop either abrupt onset of OCD and/or tics or a dramatic acute exacerbation of such symptoms following a GABHS infection.

These parallel findings have led to description of a syndrome that has been described under the acronym PANDAS (Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections) (Allen et al., 1995; Swedo et al., 1997, in press). This putative syndrome is characterized by prepubescent onset of OCD and/or tic disorder; episodic course of symptom severity, characterized by abrupt onset of symptoms or frequent, dramatic exacerbations associated with GABHS; and presence of neurological abnormalities such as hyperactivity or adventitious movements, including choreiform movements or tics (Swedo et al., in press). Typically, children in this subgroup have an abrupt onset (or exacerbation) of symptoms, distinct enough that the specific day or week of onset is recalled. Because specialized assessment and treatment may be indicated, further studies are needed to characterize this subgroup.

### **ASSESSMENT**

The diagnostic evaluation of children with OCD includes a careful assessment and review of current and past OC symptoms and comorbid conditions. A comprehensive evaluation of the child's development and psychosocial functioning, including a detailed review of the child's medical, developmental, and family histories, is essential (American Academy of Child and Adolescent Psychiatry, 1997). This evaluation requires interviewing both child and parents and usually requires more than one session.

For some children, especially those who are secretive about their difficulties, the parental concerns that bring them to clinical attention may be temper tantrums, declining school performance, food restrictions, or dermatitis, rather than OCD. The presence and severity of OCD may become clear only with careful evaluation. For these children and those who do not regard their symptoms as excessive, information from parents and, if possible, teachers is essential to identify the range of symptoms and the contexts in which they occur.

Repetitive, perfectionistic, or ritualistic behaviors and recurrent worries are common in children at various stages of development (Carter et al., 1995; Evans et al., 1997; King and Noshpitz 1991; Leonard, 1989; Leonard et al., 1990). Thus, an important step in the assessment of OC symptoms in children is to distinguish between normal childhood rituals, routines, and

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anxious worries, and pathological rituals and obsessional thoughts. Obsessive concerns about sameness or symmetry, "just right" phenomena, insistence on order in certain situations, and upset if thwarted, occur as an apparently normal developmental phenomenon in as many as two-thirds of preschoolers and appear with the greatest intensity in children aged 2 to 4 years (Evans et al., 1997). For example, many normal preschool children develop bedtime rituals and superstitious routines. These may serve to bind mild anxiety, especially at times of separation, transition, or uncertainty, but usually do not produce substantial distress. School-aged children's repetitive games, rituals, and activities are pleasurable, readily suppressible, and non-impairing. Anxious worries usually are related to current experience or specific stressful contexts, such as an upcoming exam, athletic activity, or separation. Otherwise normal children may manifest transient obsessional or compulsive phenomena at stressful points in normal development, such as the preschooler faced with strong parental pressures for control of messing or aggression or the adolescent who tries on an ascetic stance for a brief period of time (King and Noshpitz, 1991).

In contrast, pathological obsessions and compulsions are recurrent and intrusive thoughts and urges that are distressing, bothersome, and interfere with daily functioning. Although children may experience their repetitive thoughts or urges as senseless or excessive, this perception of symptoms as ego-dystonic is highly variable across children and in any given child over time. Children often are secretive or embarrassed about their obsessive and compulsive symptoms and may attempt to deny, minimize, or explain them away. (In response to parental concerns, a child may defensively protest "I can stop any time I want.")

Thus, both for diagnosis and treatment planning, it is important that in addition to identifying specific symptoms, the clinician should assess their context, frequency, and degree of associated distress and impairment, as well as the child's efforts (if any) to resist the obsessions and compulsions and the success of such efforts. The child's attitude and degree of insight into the symptoms also must be determined.

The clinician should inquire about the presence or absence of the various characteristic types of obsessions and compulsions. It is important to understand the child's and family's own terms for describing the child's symptoms; at the same time, it is essential to inquire in detail about the phenomenology of the symptoms, rather than settling for initial summary references to "obsessions" or "compulsions" (King and Cohen, 1994). For children whose symptoms are predominantly obsessions, the clinician should ask whether the child performs compulsive acts or rituals to relieve them or prevent feared outcomes. Total time spent on a worry or compulsion is one useful measure of severity; in other cases, where the symptoms are brief but frequent, the usual longest symptom-free period may be a more useful measure of severity.

The context and type of onset and course of symptoms should be ascertained. Once the diagnosis of OCD has been established, instruments such as the Yale-Brown Obsessive Compulsive Scale (Y-BOCS) (Goodman et al., 1989a,b) or Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS) (Scahill et al., 1997a) can be used to rate and record symptom severity. Even when not formally used for rating, such scales provide a useful summary and guide to the realms to be systematically assessed. Despite some methodological issues regarding the distinction between obsessions and compulsions and the measurement of resistance and control (Scahill et al., 1997a; Woody et al., 1995), these semi-structured clinician-rated

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instruments have shown reliability and validity as well as sensitivity to change. The Children's Version of the Leyton Obsessional Inventory (Berg et al., 1988) also is a useful symptom and severity inventory for children older than age 10 years; the instrument has population norms and includes OC personality traits.

One important dimension of assessment of childhood OCD concerns the degree to which parents have become entangled with the child's symptoms. This is a common feature of OCD in children and often seriously impairs family life, interferes with treatment, and perpetuates the child's symptoms (Calvocoressi et al., 1995).

Given the close association of tic disorder and OCD, clinicians should inquire specifically about a history of motor tics (e.g., blinking; grimacing; head, neck, or jaw movements) or phonic tics (e.g., sniffing; throat clearing). In the case of some symptoms (e.g., spitting, complex tapping and touching patterns) it may be difficult to distinguish compulsive habits from complex tics. Both tics and compulsions may be preceded by premonitory physical sensations, urges, and mental perceptions that persist until the action is completed (Cohen and Leckman, 1994; Leckman et al., 1994, 1995). Children less commonly report these subtle phenomena either because they are absent or, if present, young children may not be capable of describing them. In general, complex tics can be ruled out if there is no history of simple tics.

Even when tics are present, it is worthwhile to inquire if the repetitive habits are accompanied by specific fears or at least a vague discomfort that something bad might happen if the ritual is not performed.

In addition to compulsions, clinicians should ask about compulsive habits such as hair pulling, nail biting, or face- or scab-picking, which may accompany body dysmorphic disorder.

While focusing on the child's symptoms, it also is important to assess the larger context of the child's personality, functioning, and developmental adaptation to his or her family, school, and social environment (American Academy of Child and Adolescent Psychiatry, 1997). A careful developmental history is necessary to identify areas of delay or difficulty. Assessing both the presence of depression, perfectionism, irritability, impulsivity, anxiety, aggression, eating concerns, or psychotic symptoms, and their relationship to the obsessions and compulsions, is essential to planning effective, comprehensive treatment. Family history of OCD and related tic or anxiety disorders should be assessed, since OCD and associated tic disorder are often familial (Lenane et al., 1990; Leonard et al., 1992; Pauls et al., 1995; Riddle et al., 1990). A positive family history may influence parental attitudes toward the child's symptoms, while a family history of tics may be a potential predictor of medication response (McDougle et al., 1994a). Assessment of the child's school performance also is important, since obsessions and compulsions may interfere with the child's academic performance (e.g., compulsive re-reading or re-writing or pathological perfectionism) (Adams et al., 1994). Co-morbid anxiety, attention and impulse problems, and associated cognitive impairments also may have an adverse impact on the child's school participation.

A child with acute onset or exacerbation of OC and/or tic symptoms requires careful consideration of medical illnesses, including upper respiratory infections, during the preceding months. A throat culture and an antistreptolysin O (ASO) or anti-streptococcal DNAase B titre may be considered to assist in diagnosing a GABHS infection.

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### TREATMENT

The nature and severity of OC symptoms, the range of co-morbid psychopathology, and the impact of the disorder on the child's and family's functioning vary significantly in children with OCD. Individual features, therefore, may have important implications for treatment planning in terms of compliance, response to treatment, and factors that exacerbate or ameliorate symptoms. Each child or adolescent presenting with apparent OC difficulties warrants a comprehensive, individualized assessment of symptoms, comorbidity, and psychosocial factors. In addition to targeting the content and severity of the core OCD symptoms, effective treatment planning for children with OCD also must consider the presence of comorbid difficulties; the child's developmental level, personality, and adaptive functioning; and the family context (American Academy of Child and Adolescent Psychiatry, 1997; King and Cohen, 1994). Mild obsessions or compulsions that are not the source of substantial distress or impairment may warrant monitoring over time without the initiation of specific treatment. Where these appear related to external or developmental stresses, psychotherapy or other psychosocial interventions targeted to these stresses may be useful. Psychotherapy also may be useful for OC personality traits. To foster optimal involvement in treatment, both the patient and family should participate to the greatest extent possible in the development of the individualized treatment plan.

The process of assessment and treatment planning can have important beneficial effects in its own right. Children with OCD are often secretive about their symptoms, which they regard (or fear others will regard) as shameful. Furthermore, children may view their symptoms or associated impairment quite differently than their parents (Berg et al., 1989). By the time they come to clinical attention, some children with OCD and their parents may have become caught up in a vicious cycle of mutual coercion and irritation. The opportunity to review and discuss the child's difficulties with a knowledgeable professional; to de-stigmatize and reframe the symptoms as manifestations of a disorder, rather than willful or crazy behavior; and to plan a course of treatment based on a review of effective options each encourages a treatment alliance.

Only two treatment modalities, cognitive-behavioral therapy (CBT) and serotonin reuptake inhibitors (SRIs), have been studied systematically and shown empirically to have specific efficacy for the core symptoms of OCD. Although some uncontrolled case studies have found psychotherapy useful in treating childhood OCD or OC personality traits (Adams, 1973; Target and Fonagy, 1994), the effectiveness of psychotherapy alone (other than CBT) for the core obsessive and compulsive symptoms of OCD has not been systematically studied. However, psychotherapy may be an important adjunctive component of a comprehensive treatment approach to children with OCD. For example, psychotherapy may play a significant role in teaching coping skills, increasing the child's sense of mastery, treating accompanying anxiety and depressive symptoms, addressing co-morbid diagnoses and family issues, and helping improve peer and family relationships.

Family psychopathology is neither necessary nor sufficient for the onset of OCD (Lenane, 1989). Nonetheless, families affect and are affected by the disorder. For example, high "expressed emotion" may exacerbate OCD; a calm, supportive family may improve outcome (Hibbs et al., 1991). Some families become extensively involved in participating in the child's compulsive rituals or reassuring obsessional worries in an effort to avoid anxious or angry blow-

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ups; other families resist participation but become mired in grueling angry struggles and arguments with their symptomatic child. Work with families on how to manage the child's OCD symptoms, cope with the stress and family disruption that often accompanies OCD, and participate effectively in behavioral and pharmacological treatment is thus essential (Lenane, 1991). Although a major focus of parent work is to diminish parental entanglement with the child's symptoms, such interventions must go hand in hand with measures that diminish the child's distress. Family support groups, such as those described by Lenane (1996), also can help families acquire useful intervention skills and prevent discouragement. Advocacy groups, such as the Obsessive Compulsive Foundation and the Tourette's Syndrome Association, can provide valuable resources and support. In addition to measures directed at the child's symptoms, family work often is needed to address the host of adaptational, interpersonal, and comorbid difficulties that may accompany childhood OCD.

### COGNITIVE-BEHAVIORAL THERAPY

Flexible, empirically supported cognitive-behavioral treatments are now available for many childhood mental illnesses (Kendall, 1993), including CBT for children and adolescents with OCD (March, 1995). As with adults (Baer, 1993; Foa et al., 1991), CBT is regarded by many as the psychotherapeutic treatment of choice for children and adolescents with OCD (Leonard et al., 1994a). CBT presents a logically consistent and compelling relationship between the disorder, the treatment, and the specified outcome (Baer, 1993; Foa and Kozak, 1985). Furthermore, in contrast to medication, for which relapse is common when treatment is withdrawn (Pato et al., 1988), CBT has been shown to be a durable treatment, although booster or refresher sessions may be required from time to time (Hiss et al., 1994). A recent review identified more than 30 publications, mostly case reports, illustrating the benefits of exposure-based interventions for pediatric OCD (March, 1995). Since then, additional case studies have been published showing efficacy of CBT (Albano et al., 1996; March et al., 1995b; Piacentini et al., 1994; Scahill et al., 1996). Nevertheless, in contrast to the extensive adult literature, the empirical evidence supporting CBT in children calls for replication and extension (March, 1995; March and Mulle, 1996).

Treatment generally involves a three-stage approach consisting of information gathering, therapist-assisted exposure and response prevention (E/RP), and homework assignments. As with adults, hierarchy-based E/RP is the central element in treatment (Bolton et al., 1983). Exposure relies upon the fact that anxiety usually attenuates after sufficient duration of contact with a feared stimulus (Foa et al., 1980; Foa et al., 1985). Thus, a child with fear of germs must confront relevant feared situations until his or her anxiety decreases. Repeated exposure is associated with decreased anxiety across exposure trials, with anxiety reduction largely specific to the domain of exposure, until the child no longer fears contact with specifically targeted phobic stimuli (March et al., 1994). Exposure is typically implemented in a gradual fashion (sometimes termed Agraded exposure@) preferably with the patient playing an active role in the choice and sequence of situations targeted for exposure. Adequate exposure depends on blocking rituals or avoidance behavior, a process termed response prevention. For example, a child with germ worries must not only touch "germy things," but must refrain from ritualized washing until

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his or her anxiety diminishes substantially. Selection of E/RP tasks by the child from those items where the child is already successfully resisting OCD maximizes the probability that E/RP will be successful (March and Mulle, 1996).

Component analyses of CBT in adult OCD suggest that both exposure and response prevention are active ingredients of treatment, with exposure reducing phobic anxiety, and response prevention reducing performance of rituals (Foa and Kozak, in press; Foa et al., 1980; Foa et al., 1984; Marks, 1987).

Clinically, both temperament and developmental stage influence a child's ability to understand the requirements of E/RP and his or her willingness and ability to tolerate the often intense affects associated with E/RP (March et al., 1995c; Scahill et al., 1996). Beyond adjusting the therapeutic conversation to match the child's level of understanding, CBT typically includes a "tool kit" the child can use to manage thoughts and feelings before, during, and after E/RP (March et al., 1994). Typical interventions for children with predominantly internalizing symptoms include relaxation training, breathing-control training, and cognitive training (CT), which have been proven helpful in children with other anxiety disorders (Albano et al., 1995; Kendall, 1994). While relaxation appears to have no direct beneficial effect on obsessions or compulsions, relaxation may aid the child with high levels of anxiety successfully complete E/RP tasks. Cognitive therapy for OCD, as distinct from response prevention for mental rituals, includes reinforcing accurate information regarding OCD and its treatment, self-administered positive reinforcement, targeting erroneous "OCD beliefs" (Kearney et al., 1990; van Oppen et al., 1995), and cultivating psychological distance from OCD symptoms (Schwartz, 1996). Used alone, cognitive therapy is a less effective treatment for OCD than E/RP (Kearney et al., 1990). Although positive or negative consequences are not especially helpful by themselves as treatments for OCD per se, the use of a systematic reinforcement plan, such as rewards contingent on compliance with CBT exercises, may be helpful in maintaining compliance in children with oppositional behavior or a comorbid disruptive behavior disorder. Group versions of CBT for adolescents with OCD have been developed and appear effective (Fischer et al., in press).

While clinical observations suggest that a combination of child and family sessions is best for most patients (March et al., 1995c; March et al., 1996), determining the extent of family involvement in treatment is a key consideration (Knox et al., 1996; Piacentini et al., 1994). Extensive family involvement in rituals, or coincident family dysfunction that constrains the implementation of individual CBT, requires that family members play a more central role in treatment. Abrupt, unilateral, or confrontational interventions, such as when a parent stops participating in OCD rituals without the child's collaboration, are almost never helpful because: (1) parents often have no workable strategy for managing the child's distress; (2) target symptoms often are inaccessible; and (3) most importantly, such measures fail to help the child internalize a strategy for coping with current and potential OCD symptoms (Harris and Wiebe, 1992; March and Mulle, 1996).

Implementation of CBT requires establishing a treatment alliance with the child. Even with children who regard their obsessions and compulsions as ego-dystonic, enlisting the child's cooperation entails helping the child to understand that he or she will not be required to tolerate unbearable anxiety, that the child will play an active role in choosing the sequence of symptoms

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and situations to be confronted, and that compliance with treatment will help increase mastery and ultimately diminish anxiety (Scahill et al., 1996). Approached correctly, most children readily comply with CBT (March and Mulle, 1996), and the majority who comply experience significant symptom relief (Albano et al., 1995; March et al., 1994; Piacentini et al., 1994; Scahill et al., 1996).

Prognostic indicators of good response to CBT include a motivated patient willing to cooperate with treatment, presence of overt rituals and compulsions, ability to monitor and report symptoms, and absence of complicating co-morbidities (Foa and Emmelkamp, 1983). Factors contributing to partial or non-response to CBT alone include extensive co-morbidity, either with internalizing or disruptive behavior disorders; family conflict that interferes with CBT; and developmental factors, such as very young age, mental retardation, or pervasive developmental disorder. CBT appears less effective in children with either obsessions only or obsessional slowness than in children with compulsions. Indeed, primary obsessional slowness appears to respond poorly to both behavioral and medication treatment (Wolff and Rapaport, 1988). Children with pure obsessions or obsessional slowness may require other cognitive behavioral techniques such as modeling and shaping (Ratnasuriya et al., 1991) or thought-stopping (March, 1995). Unfortunately, among the greatest barriers to successful CBT is the relative lack of psychotherapists adequately trained in the method.

### SEROTONIN REUPTAKE INHIBITORS

The availability of the serotonin reuptake inhibitor (SRI) CRI and the SSRIs fluoxetine (Prozac), fluvoxamine (Luvox), paroxetine (Paxil), and sertraline (Zoloft) have dramatically changed the treatment of OCD. The Food and Drug Administration has approved the following agents for treatment of OCD in the specified age groups: CMI, age 10 years and older; fluvoxamine, age 8 years and older; sertraline, age 6 years and older. Investigational trials of the other SSRIs in children with OCD are underway or pending publication (March et al., 1997b; Riddle et al., 1996). The pharmacology of these agents in children and adolescents recently was reviewed (Leonard et al., 1997).

#### Clomipramine

CMI is the most extensively studied of the SRIs in children. Both double-blind, placebo-controlled, crossover (Flament et al., 1985) and parallel (DeVeugh-Geiss et al., 1992) comparisons have found CMI significantly superior to placebo, with moderate improvement apparent by 5 weeks in 75% of subjects.

A 10-week, double-blind, crossover comparison of CMI and desipramine (a selective noradrenergic reuptake inhibitor) in children and adolescents with OCD found CMI significantly better than desipramine in ameliorating the OCD symptoms at Week 5, with the rate of improvement on desipramine no different than that observed on placebo in other studies (Leonard et al., 1989). The superiority of CMI over other tricyclic antidepressants (TCAs) appears related to its potent serotonergic properties and is consistent with the absence of response to these other antidepressants.



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An adequate therapeutic trial of CMI generally consists of dosages up to 3 mg/kg/day for 3 months. Dosages should not exceed 5 mg/kg/day or 250 mg/day because of the risk of toxicity, including seizures and electrocardiogram (ECG) changes. CMIs anticholinergic and antihistaminic side effects are typical of tricyclic antidepressants. Anticholinergic side effects include dry mouth, somnolence, dizziness, tremor, headache, constipation, stomach discomfort, sweating, and insomnia and are similar to (but anecdotally reported as milder than) those seen in adults (DeVeugh-Geiss et al., 1992; Leonard et al., 1989). As with other TCAs, CMI can cause tachycardia and axis changes and prolongation of intervals on EKG. Thus many authors recommend baseline and periodic EKG monitoring (Leonard et al., 1995), with particular attention to the QTc interval (Riddle et al., 1993).

### Selective Serotonin-reuptake Inhibitors

The SSRIs represent a new class of agents with distinct advantages over the TCAs in side effect profile and therapeutic index. Large systematic trials of SSRIs in adult patients with OCD have been reported for fluoxetine, fluvoxamine, paroxetine, CMI, and sertraline (Goodman et al., 1996; Greist et al., 1995a,b; Rasmussen et al., in press; Tollefson et al., 1994). All of these SSRIs are under study in the pediatric age group. Initial studies suggest that the SSRIs are safe, effective, and tolerated well in children and adolescents with a similar side effect profile to that seen in adults (Apter et al., 1994; Geller et al., 1995; Leonard et al., 1997; Riddle et al., 1992, 1997). Geller et al. (1995) found children ages 6 to 12 years responded to fluoxetine similarly to older adolescents at doses averaging 1 mg/kg per day and that this improvement persisted in children who remained on medication during an average follow-up period of 19 months.

In general, the most commonly described side effects of the various SSRIs include nausea, headache, tremor, gastrointestinal complaints, drowsiness, akathisia, insomnia, disinhibition, agitation, or even hypomania (King et al., 1991; Leonard et al., 1997; Riddle et al., 1991).

In adults on SSRIs, a Afrontal-lobe@ syndrome, characterized by apathy and/or disinhibition, has been described (Hoehn-Saric et al., 1991). These agents can also alter sleep architecture and diminish sleep efficiency, producing insomnia, daytime sedation, and/or impaired cognitive performance even in the context of an apparently full night=s sleep (Winokur and Reynolds, 1954). Although the SSRI=s occasionally can exacerbate or precipitate tics (Delgado et al., 1990; Fennig et al., 1994), especially at higher doses, they frequently are useful in treating OCD in patients with tics, without exacerbating tics in most cases (Apter et al., 1994; Scahill et al., 1997b).

Although direct comparison data in children are lacking, the different SSRIs appear to have clinically significant differences in pharmacokinetic and side effect profile, half-life, and relative ability to alter the metabolism of other medications (Leonard et al., 1997). As knowledge increases regarding potential drug interactions, it has become apparent how little is known about the pharmacokinetics of these agents, alone or in combination, in children and the special risks polypharmacy may pose (Laird, 1996). The possibility of clinically significant drug interactions is increased with drugs that: (1) induce or inhibit hepatic microsomal enzymes, (2) have a low therapeutic index, (3) have multiple pharmacologic actions, and (4) may be metabolized differently in high-risk populations (Callahan et al., 1993; Nemeroff et al., 1996).

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Fluoxetine is distinguished from the other SSRIs by the long half-life of the parent compound and active metabolite; steady state is not reached for 2-3 weeks, and the drug is not completely eliminated from the system for up to 6 weeks after discontinuation. Fluoxetine has the advantage over other SSRIs of being available in liquid form, making it possible to begin with initial dosages in children as low as 2.5 mg/day to 5.0 mg/day and to titrate dosages precisely.

### Choice of Agent

Although the serotonergic agents differ in potency and selectivity, the differences appear unrelated to clinical anti-obsessional efficacy. A variety of direct comparison studies (Den Boer et al., 1987; Koran et al., 1996; Lopez-Ibor et al., 1996; Milanfranchi et al., 1997; Pigott et al., 1990; Zohar and Judge, 1996) and statistical meta-analytic studies (Greist et al., 1995a) compare the various SRI/SSRIs in adults with OCD. Some meta-analytic studies in adults have found a modestly but significantly greater anti-obsessional effect size for CMI than for fluoxetine, fluvoxamine, or sertraline (Greist et al., 1995a; Piccinelli et al., 1995; Stein et al., 1995), although direct comparative studies have generally found the therapeutic efficacy of the agents to be comparable. No comparable studies are available for children and adolescents. In their absence, it is not known whether one SRI/SSRI is more effective than another for treating childhood OCD. Thus, in practice, the clinician's choice of agent may depend on side effect profile and potential for drug interactions (Leonard et al., 1997). CMI has the most anticholinergic side effect profile, requires EKG monitoring in children, and is the most toxic in an overdose. In contrast, the SSRIs do not require EKG monitoring, but may be associated with more complaints of headaches, nausea, insomnia, and agitation. Sometimes, comorbidity might argue for or against a TCA, although this has not been well studied. History of treatment response in family members with OCD to various agents may help in selection, although there are no studies to support this approach.

The hepatic metabolism and competitive inhibition profile (P450 enzyme system) of each agent should be considered if the use of concomitant medications are contemplated (Leonard et al., 1997). The potential interaction of any two medications should be weighed in the choice of medication (Nemeroff et al., 1996).

In summary, consideration of medical issues, potential side effects, concomitant medications, comorbid disorders, suicide risk, and previous trials requires an individualized decision for each patient.

### Dose and Duration

A trial of adequate dosage and duration (10 to 12 weeks) is generally necessary to determine whether a child is a responder to a given SRI or SSRI (Greist et al., 1995a). Many patients do not show symptom improvement for 6 to 10 weeks and may continue to improve during the first 3 months of pharmacotherapy. In the first 10 days of treatment, some patients may develop a worsening of OCD symptoms or complain of an agitated feeling ("jitteriness syndrome") (Riddle et al., 1991); this syndrome may be comparable to that described in adults on a variety of antidepressants (Pohl et al., 1988). The patient should be encouraged to continue

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the trial, perhaps at a reduced dose, since this phenomenon often subsides after the initial few days.

Systematic dose response data are not available for children. The fixed dose design studies in adults suggest that the dosages used in the adult multi-center trials (e.g., CMI 250 mg, fluoxetine 60 mg, sertraline 200 mg, fluvoxamine 300 mg, paroxetine 60 mg) were on the high end and suggest lower therapeutic dosages may be appropriate. In adult fixed dose studies of fluoxetine at 20 to 60 mg/day (Tollefson et al., 1994) or sertraline at 50 to 200 mg/day (Greist et al., 1995b), the lowest doses were effective with fewer dropouts than the higher dosages. Since a clinical response is unlikely in the first 3 weeks, it usually is preferable to start with a low dosage that is increased slowly, thereby allowing a patient to tolerate the medication and avoiding dose-related side effects. The duration of a trial may be as critical as dosage, suggesting the advisability of targeting a therapeutic dosage that is tolerable in terms of side effects and waiting at least 10 to 12 weeks before changing agents or undertaking augmentation regimens.

### Responders and Non-responders

Failure to respond to one SSRI does not necessarily predict failure to respond to another SSRI (Rasmussen et al., in press). Thus, if there is no clinical response after 10 to 12 weeks, switching to another SSRI is reasonable. Unfortunately, there are no systematic studies that compare switching medications to adding an augmenting agent to the initial medication. Even on adequate trials of different SSRIs, however, a substantial number of children and adults either are non-responders or have significant residual OCD symptoms (McDougle et al., 1994a).

For patients who have only a partial clinical response to the successive 10 to 12 week trials of various SRI/SSRIs, augmentation strategies may be useful. Of the numerous classes of medications tried as augmentation agents, only clonazepam, desipramine, risperidone, haloperidol, lithium, and buspirone have received systematic study, all in adults. Of these, only clonazepam (Pigott et al., 1992); haloperidol (McDougle et al., 1994a); and risperidone (McDougle et al., in press) have proven superior to placebo in controlled studies in adults. A comorbid tic disorder was associated with a positive response to haloperidol augmentation of fluvoxamine, as was a schizotypal personality disorder (McDougle et al., 1994a). Risperidone (mean dose 2.2 mg) was superior to placebo in reducing OCD, depressive, and anxiety symptoms in OCD patients unresponsive to SRI alone; there was no difference in treatment response to risperidone addition in OCD patients with or without chronic tics or schizotypal personality disorder (McDougle et al., in press).

Careful consideration, however, is required prior to prescribing a neuroleptic in children, due to potential side effects of cognitive impairment, sedation, dysphoria, weight gain, extrapyramidal symptoms (including acute and tardive dyskinesias), as well as the increased incidence of side effects with concomitant pharmacotherapeutic agents. In children, concerns have been expressed about benzodiazepine augmentation, including the need to avoid abrupt discontinuation, the potential for drug dependency, and the rare symptoms of disinhibition. Further studies are needed to clarify recommendations for children.

### Predictors of Response

The predictors of response are largely unknown. Individuals with a comorbid or family history of tic disorder may not respond as well to the SSRIs (McDougle et al., 1994a). In adult

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subjects, but not in pediatric samples, later age of onset may be a predictor of response to CMI (Ackerman et al., 1994).

### Long-term Maintenance

The optimal duration of maintenance treatment in an individual who has responded to an SRI/SSRI is unclear. Although periodic discontinuation trials are advisable, many responders require ongoing maintenance pharmacotherapy. In a double-blind discontinuation study (Leonard et al., 1991) using a 2-month desipramine substitution phase with children and adolescents on long-term CMI maintenance, 89% of patients relapsed within the 2 months of substitution. Comparable rates of relapse are observed within 7 to 12 weeks of withdrawal from maintenance CMI (Pato et al., 1988) or fluoxetine (Pato et al., 1991). These studies suggest that long-term maintenance may be required for some patients, although CBT may decrease the need for long-term pharmacotherapy (March et al., 1995a). Even patients on CMI maintenance may continue to exhibit some OC symptoms that vary in severity over time (Leonard et al., 1989).

Abrupt discontinuation of CMI (Leonard et al., 1989) or those SSRIs with shorter half-lives (e.g., sertraline, paroxetine, and fluvoxamine) has been noted to produce withdrawal syndromes consisting of gastrointestinal disturbance, headache, dizziness, malaise, and/or insomnia (Barr et al., 1994; Black et al., 1993; Dilsaver and Greden, 1984; Dominguez and Goodnick, 1995).

## INVESTIGATIONAL TREATMENTS

A variety of investigational treatments have been studied, primarily in adult patients, for OCD unresponsive to behavioral treatment or standard pharmacological approaches.

### Intravenous Clomipramine

Several small open trials have examined the efficacy of intravenous CMI in adults (Fallon et al., 1992; Warneke 1989) who were non-responders or could not tolerate the side effects of oral medication. Typically, intravenous CMI was administered for 2 to 6 weeks to patients who did not respond or could not tolerate oral CMI. Other double-blind, placebo controlled studies of small samples have found the method useful for OCD (Koran et al., 1997). Speculation about how intravenous treatment might work includes rapid down-regulation of serotonergic receptors and/or decreasing first-pass hepatic metabolism, thereby increasing the CMI: metabolite ratio and the relative potency of serotonin reuptake inhibition. This mode of administration is still investigational for adults and there are no data regarding its efficacy or safety in children.

Additionally, a double-blind controlled trial of penicillin prophylaxis (4 months of placebo and 4 months of penicillin) for children whose OCD or tic disorder symptoms are precipitated or exacerbated by GABHS is ongoing. If a unique subgroup of children with OCD and/or tic disorders can be identified, novel treatment methods (immunomodulatory and antibiotic) may be effective and may ultimately prove to have a role in long-term maintenance and prophylaxis.

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### Investigational Immunomodular and Antibiotic Treatments

The identification of a subgroup of children who developed OCD and/or tic disorders after GABHS pharyngitis (Allen et al., 1995; Swedo et al., 1989b, 1994, 1997) has led to investigational trials of immunomodulatory interventions based on trials in children with SC. These include plasmapheresis and intravenous immunoglobulin. Preliminary results describe significant improvement in children with severe illness who have an apparent underlying autoimmune basis to the triggering of their illness (Allen et al., 1995; Tucker et al., 1996). Treatment trials are ongoing. However, immunomodulatory approaches are investigational and should be used only for very severe cases that meet the appropriate criteria and in the context of a protocol approved by a human investigative committee. Plasmapheresis is an arduous procedure, while intravenous administration of pooled immunoglobulins may carry unknown risks of viral transmission.

### Psychosurgery

Psychosurgery has been used in adult patients with severe OCD not responsive to aggressive pharmacology and behavioral treatment. Although newer neurosurgery techniques, including use of the gamma knife and circumscribed anterior capsulotomy or cingulotomy and subcaudate tractotomy, have proven effective in investigational studies in some adults with intractable, incapacitating OCD (Baer et al., 1995), such irreversible surgical techniques have not been studied in children, nor is their effect on the developing nervous system known.

## INITIAL TREATMENT

If a child's OCD is unaccompanied by other significant psychopathology, developmental difficulties, or family dysfunction unrelated to the child's obsessions and compulsions, the initial treatment choices are CBT or anti-obsessional medication, either alone or in combination. If additional difficulties are limited to irritability and struggles with parents over the performance of compulsions, further interventions may not be required. In a large proportion of cases, however, where other significant psychopathology, developmental difficulties, or family problems accompany OCD, additional psychotherapeutic (individual and/or family), school, and/or pharmacological interventions are indicated from the onset.

In the absence of direct comparative trials, clear empirical guidelines are lacking for determining whether to begin with CBT, an SRI, or both. A recent panel of experts (March et al., 1997a) favored CBT as the initial treatment of choice for children and adolescents with OCD, especially in milder cases without significant co-morbidity. The choice of CBT as the initial treatment has the advantage of apparent durability and of avoiding the potential side effects of medication. Further, because the natural history of mild cases of OCD in younger children is unclear, this choice avoids committing the child to an uncertain period of medication. In specific cases, however, after consultation with parents, an anti-obsessional medication may be the initial choice of treatment because of the time, effort, expense, or anxiety associated with behavioral therapy or the unavailability of a clinician trained in the use of E/RP in children. Other indications for beginning with medication include the child's insufficient cognitive or emotional maturity to cooperate in CBT (including the ability to view the symptoms as ego-

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dystonic, form an alliance, or tolerate anxiety during exposure) or the lack of family support for the treatment.

### OCD with Comorbid Psychopathology

Many clinicians believe the presence of co-morbid depression, anxiety, or disruptive behaviors are indications for including an SRI as part of the initial treatment (March et al., 1997a). The impact of CBT alone on co-morbid difficulties, such as irritability, depression, general anxiety, and impulsivity, remains largely unstudied. To the extent that some such difficulties reflect the burden of OCD symptoms on the child and family, effective CBT for the core OC symptoms might be expected to have broadly beneficial effects. In other cases, however, co-morbid symptoms may reflect the influence of neurobiological factors underlying the pathogenesis of both the core OCD symptoms and mood, anxiety, attention, tic, and/or temperamental difficulties. Whether CBT is as effective as pharmacological interventions with associated psychopathology remains to be determined. In some cases, the severity of these co-morbid difficulties may warrant medication in their own right.

As various potential subtypes of OCD are elucidated (e.g., tic-related vs. non-tic-related; familial vs. non-familial; prepubescent vs. pubertal vs. adult onset; infection-triggered vs. non-infection related), it is important to establish whether these subtypes also differ in their relative responsivity to CBT alone or in combination with medication. For example, in contrast to washing compulsions driven by contamination fears, many of the compulsions that occur in children with tic disorder are driven by a premonitory urge or need to repeat an action until it feels just right. The latter compulsions may benefit from habit-reversal techniques, which use self-monitoring, relaxation, and competing motoric responses in addition to response prevention and have proven useful in habit disorders such as trichotillomania (Baer, 1992; Vitulano et al., 1992).

Clinically, pharmacotherapy and CBT work well together, and many clinicians believe (without supporting empirical documentation) that children with OCD require or benefit optimally from combined CBT and pharmacotherapy (March et al., 1995a, 1997a; Piacentini et al., 1992). In the March et al. (1994) study of protocol-driven CBT, when CBT was added to a stable medication regimen, the average magnitude of improvement on the Y-BOCS was greater than that usually seen with medications alone. Wever and colleagues (1994) reported similar results in Australian children and adolescents treated with CMI who accepted brief high-intensity hospital-based CBT. In the March et al. study (1994), two-thirds of CBT responders successfully discontinued medication during a 2-year follow-up interval, implying that CBT may reduce relapse rates in patients withdrawn from medication. Although studies are in progress (Van Engeland et al., 1994), currently available data provide no definitive answer to the clinically relevant question of whether CBT and medication are equally effective, or whether combined effects are synergistic relative to individual treatments; nor do studies adequately address the effect of CBT on relapse prevention. Pending more detailed studies, however, there appears to be tentative support for the benefits of combining both approaches, even in those patients for whom ongoing pharmacotherapy proves necessary, since CBT, including booster treatments during medication discontinuation, may improve both short and long-term outcome in medication-responsive patients.

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Children whose OC symptoms are accompanied by other substantial psychopathology, developmental difficulties, and/or family problems usually require the corresponding appropriate individual and/or family psychotherapeutic, educational, and/or pharmacological interventions. Although family or social problems do not appear to cause OCD, improving family functioning and the child's adaptive functioning at home and school also can have non-specific beneficial effects on the child's symptoms and treatment compliance.

Children whose OC symptoms, or accompanying anxiety, depression, attention, conduct, or learning problems interfere with participation in school or academic progress require close collaboration between the clinician and school personnel to provide and monitor appropriate educational and curricular adjustments (Adams et al., 1994). When OCD symptoms are prominent at school, specific response guidelines for school personnel may be useful.

### **Potentially Post-infectious OCD**

A positive streptococcal throat culture warrants standard antibiotic treatment. Evidence of the onset or exacerbation of OCD associated with streptococcal exposure warrants ongoing monitoring for recurrent streptococcal infection.

## **ONGOING TREATMENT**

To monitor treatment response, it is necessary to assess, in a systematic fashion, the child's symptom frequency, intensity, distress, and impairment, both at home and in school, using parent-, teacher-, and self-reports. Ongoing evaluation is necessary to guide treatment planning and to indicate the need for modifications in treatment modality, dosage, or setting.

### **Non-responders and Partial Responders to CBT**

For children who do not respond or have only a partial response to CBT alone, the next strategy is to alter the CBT technique, intensity, setting, or format and/or to add an SRI. Techniques that may facilitate E/RP include positive reinforcement to encourage exposure; anxiety management for coping with exposure-related anxiety; thought-stopping or cognitive restructuring; modeling and shaping; and family intervention to improve compliance (March, 1995). Although CBT usually is implemented initially with 13 to 20 weekly individual or family sessions with E/RP homework assignments, partial or non-responders may require more frequent visits, out-of-office therapist-assisted E/RP, or even, in severe and unresponsive cases, daily visits in an office, partial hospital, or inpatient setting. Hospitalization also may be necessary when self-injurious or aggressive compulsions are prominent.

Depending on the severity of symptoms, an SRI or SSRI should be considered for compliant patients who have no response after 2 to 4 weeks to a well-delivered trial of CBT, or who have only a partial response after 4 to 7 weeks of CBT (March et al., 1997a).

### **Non-responders and Partial Responders to Medication**

A substantial number of children obtain no improvement or only partial relief of OCD symptoms on SRIs alone, even after 10 to 12 weeks at maximum tolerated doses. In such cases, the next strategy is to add CBT if not already initiated. In addition, it may be useful to switch

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SRI. If successive trials of two or three SRIs are unsuccessful, consideration should be given to augmentation with clonazepam or a low dose of neuroleptic. Addition of a neuroleptic may be particularly useful in children with a co-morbid tic disorder.

### Duration of Pharmacotherapy

For children whose OCD responds satisfactorily to anti-obsessional medication with or without CBT, an important treatment decision concerns how long to maintain the patient on medication. The decision to maintain a child on anti-obsessional medication indefinitely should be made only if relapse occurs repeatedly following attempts to taper medication. Patients should be maintained on anti-obsession medication for 12 to 18 months following a satisfactory response before attempting to discontinue medication (March et al., 1997a).

### Discontinuation of Pharmacotherapy

Once the decision is made to attempt a reduction or discontinuation of medication, the tapering should be gradual. Although there is no systematic evidence that gradual tapering reduces the likelihood of relapse, most experts advise gradual discontinuation, for example, by decreasing the medication 25% and observing for 2 months before making any further reductions (March et al., 1997a). As noted above, withdrawal studies in both children and adults suggest that a majority of patients relapse within a few months following complete discontinuation of medication (Leonard et al., 1991). Hence, trials of discontinuing medication should be timed for periods that are relatively low in stress when potential symptom recurrence would be least disruptive. Abrupt discontinuation of TCAs and SSRIs with short half-lives should be avoided, as it may produce a withdrawal syndrome such as gastrointestinal disturbance or malaise.

There is some evidence that CBT may reduce the need for long-term pharmacotherapy (March et al., 1995a). For those patients who experience some symptom recrudescence following medication dose reduction, booster sessions of CBT or the introduction of CBT de novo (for those who have not previously received it) may help minimize the need to return to previous medication levels.

Children and adolescents with OCD and their families are best served by continuity of care and the long-term availability of and monitoring by a knowledgeable clinician familiar with the child's unfolding developmental course and needs.

## CONFLICT OF INTEREST

As a matter of policy, some of the authors to these practice parameters are in active clinical practice and may have received income related to treatments discussed in these parameters. Some authors may be involved primarily in research or other academic endeavors and also may have received income related to treatments discussed in these parameters. To minimize the potential for these parameters to contain biased recommendations due to conflict of interest, the parameters were reviewed extensively by Work Group members, consultants, and Academy members; authors and reviewers were asked to base their recommendations on an objective evaluation of the available evidence; and authors and reviewers who believed that they might



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have a conflict of interest that would bias, or appear to bias, their work on these parameters were asked to notify the Academy.

### **SCIENTIFIC DATA AND CLINICAL CONSENSUS**

Practice parameters are strategies for patient management, developed to assist clinicians in psychiatric decision-making. These parameters, based on evaluation of the scientific literature and relevant clinical consensus, describe generally accepted approaches to assess and treat specific disorders, or to perform specific medical procedures. The validity of scientific findings was judged by design, sample selection and size, inclusion of comparison groups, generalizability, and agreement with other studies. Clinical consensus was determined through extensive review by the members of the Work Group on Quality Issues, child and adolescent psychiatry consultants with expertise in the content area, the entire Academy membership, and the Academy Assembly and Council.

These parameters are not intended to define the standard of care; nor should they be deemed inclusive of all proper methods of care or exclusive of other methods of care directed at obtaining the desired results. The ultimate judgment regarding the care of a particular patient must be made by the clinician in light of all the circumstances presented by the patient and his or her family, the diagnostic and treatment options available, and available resources. Given inevitable changes in scientific information and technology, these parameters will be reviewed periodically and updated when appropriate.

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