

# Tic or Compulsion? It's Tourettic OCD

Charles S. Mansueto  
David J. Keuler

A subgroup of individuals suffering from obsessive-compulsive disorder (OCD) frequently present to treatment with an atypical yet distinguishable array of symptoms akin to both Tourette's disorder (TD) and OCD. These individuals often receive standard treatments for OCD (or less likely, TD) that fail to address the blended features of their presentation. It is argued that these individuals would be better served, both psychotherapeutically and pharmacologically, by the adoption of a Tourettic OCD (TOCD) conceptual framework.

(Reprinted with permission from *Behavioral Modification* 2005; 29(5):784–799)

**Obsessive-compulsive disorder** (OCD) typically manifests itself as an array of thematically elaborated intrusive thoughts or images (obsessions) accompanied by ritualized, overt, or covert behaviors (compulsions) that individuals feel compelled to perform (American Psychiatric Association, 1994). However, the phenomenology of OCD is complex and varied, with important differences underscoring the likely heterogeneity of the disorder. In particular, certain distinctions involving the content of obsessions, the nature of compulsions, the functional relationship between obsessions and compulsions, and the response to treatment are potentially useful discriminators in the identification of valid OCD subtypes. Increasingly, these distinctions have become important components of a phenomenological analysis of OCD that can enhance diagnostic formulations and guide treatment planning (O'Sullivan, Mansueto, Lerner, & Miguel, 2000).

One area of emerging interest has been the substantial overlap between OCD and tic disorders including Tourette's disorder (TD). Tics are sudden, repetitive, stereotyped motor movements or phonic productions that are often perceived as involuntary but that are sometimes accompanied by premonitory sensory urges. Tics typically occur in bouts, vary in intensity, and wax and wane in severity. They may be simple such as eye blinking, neck jerking, shoulder shrugging, or throat clearing. They may also be complex such as facial gestures, smelling objects, touching, or repeating words or phrases out of context. TD is diagnosed when multiple motor tics and one or more phonic tics have been present during the course of the illness (American Psychiatric Association, 1994). Researchers have reported that 20% to 60% of TD sufferers display OCD symptoms, and studies of OCD patients have found tics in more than 50% of pedi-

atric cases and TD in 15% of cases (Leonard, Lenane, Swedo, Rettew, Gershon, & Rapoport, 1992; Pitman, Green, Jenike, & Mesulam, 1987). In addition, research findings support a genetic linkage between OCD and TD (Pauls, 1992; Pauls, Albrook, Goodman, Rasmussen, & Leckman, 1995), attest to possible shared neurobiological underpinnings (Baxter & Guze, 1992; Leckman, Goodman, et al., 1995), and describe similar clinical phenomenology (Como, 1995; Leckman, 1993). However, other evidence involving course (Leonard et al., 1992) and pharmacological treatment response (Delgado, Goodman, Price, Heninger, & Charney, 1992) suggests distinctive etiologies. OCD and TD are categorically distinct under the current *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.) diagnostic system (American Psychiatric Association, 1994); however, frequent cooccurrence of the disorders and family genetic studies challenge the adequacy of the current categorical approach.

In clinical practice, the boundary between symptoms arising from OCD and TD is not easily determined. Simple motor or phonic tics like eye blinking or throat clearing can usually be distinguished from compulsions by their relative brevity, lack of purpose, and typically involuntary nature. Complex motor tics, on the other hand, such as repeating actions a specific number of times, or until it feels right may be indistinguishable from compulsions (Castellanos, 1998; Towbin, 1988). For the clinician, however, this distinction has been a critical component of clinical decision making. If a pattern of repetitive, intrusive behaviors were construed as a compulsion, pharmacological and cognitive-behavioral treatment would appropriately be provided in accordance with current practice guidelines for OCD (March, Frances, Carpenter, & Kahn, 1997). The guidelines emphasize expo-

sure-based cognitive-behavior therapy and serotonin reuptake-inhibiting medication (SSRI's) as treatments of choice for OCD. If the behaviors were characterized as tics, behavioral strategies such as contingency management, relaxation training, self-monitoring and habit reversal would be appropriate choices (Azrin & Peterson, 1988). In these cases, neuroleptics and alpha 2 agonists have been likely choices for pharmacological treatment. A personal or family history of tics in OCD patients may provide cues for pharmacological treatment (e.g., SSRI with neuroleptic augmentation) but offers no clear treatment avenues for behavior therapy.

The frequent comorbidity between OCD and TD has focused attention on the differing clinical phenomenology of individuals presenting with combinations of the disorders. Phenomenological analysis has shown that a subset of individuals with OCD expresses a distinguishable constellation of symptoms if they or a family member have had a history of chronic tics or TD (Leckman, McDougle, et al., 2000). Leckman and colleagues have begun the important work of distinguishing these OCD subgroups on the basis of family genetic data and refer to these subgroups as *tic-related* and *non-tic-related* OCD (Leckman, McDougle, et al., 2000). They suggest a genetic vulnerability for TD that increases an individual's risk for development of a clinically distinguishable subtype of OCD: tic-related OCD. In brief, tic-related OCD, in contrast with non-tic-related OCD, is characterized by an earlier age of onset, an overrepresentation in males, symptomatology that tends to include touching, tapping and rubbing, a higher percentage of violent and aggressive intrusive thoughts and images, and concerns about symmetry and exactness. This contrasts with non-tic-related OCD that is characterized by onset after puberty, equal gender representation, contamination concerns and cleaning compulsions. Leckman, McDougle, et al. concluded that the distinction between tic-related and non-tic-related OCD was best drawn when family genetic data indicated that the individual or a first-degree family member had Tourette's syndrome (TS) or another chronic tic disorder. The authors argue that the putative subtypes of tic-related and non-tic-related OCD have enjoyed varying yet promising degrees of empirical support across phenomenological, neurobiological, genetic, and treatment outcome domains. With regard to treatment, the authors indicate that the tic-related form of OCD is less likely to respond well to pharmacotherapy employing SSRI's or to cognitive-behavior therapy for OCD.

Other authors have identified similar distinctive

phenomenological features and treatment response characteristics in some children (e.g. Geller, 1998; March & Mulle, 1998). In general, discussion of these cases has been limited, lacking both systematic explication of treatment implications and specific delineation of treatment options. Absent from the current clinical literature is a single unifying construct that facilitates identification of this common clinical phenomenon and serves to aid clinical decision making once it is identified. Clinicians, particularly those in nonspecialized practice, are likely, then, to be unaware that this symptom cluster warrants special consideration and are thus prone to treat these phenomena categorically as either tics or compulsions. In this article, we argue that this categorical approach unnecessarily limits the choice of therapeutic options and the potential for more effective treatment. The adoption of the Tourette OCD (TOCD) conceptual framework solves this problem by identifying this symptom cluster as a blend of OCD and TD, thus enhancing diagnostic formulations, guiding treatment planning, and generating a greater variety of therapeutic options.

## THE TOURETTIC OCD SYNDROME

Based on experience with hundreds of adults, adolescents, and children with OCD treated at our clinic, we argue that a substantial number of OCD patients present for treatment with an identifiable variant of OCD—more precisely, an OCD and TD blend. This blend is distinguishable from purer manifestations of either disorder and can be identified exclusively by phenomenological presentation. These patients or their first-degree family members may or may not have met criteria for TD or another tic disorder and may or may not have classic OCD symptoms; yet it is our position that their presentation is phenomenologically akin to both TD and OCD. Moreover, we believe that these patients express a constellation of symptoms (i.e., a syndrome) that is categorically distinct from more familiar forms of OCD, although this syndrome may coexist with OCD symptoms in many individuals.

We refer to this syndrome as TOCD to underscore our view that these clinical manifestations are best understood and treated as a hybrid with features associated with the two disorders, as described in detail below. TOCD was chosen (a) to emphasize the fact that many of these patients exhibit symptoms closely resembling those found in the later developmental manifestations of TD in which OCD symptoms and complex tics are said to coexist (Bruun, 1988); (b) to deemphasize a personal or family history of tics, thus including individuals

who never displayed clearly discernable motor or phonic tics; and (c) to promote this conceptual tool for the clinicians who are most likely to encounter patients with these characteristics, namely those working within the OCD realm. The TOCD term will help remind clinicians to address the Tourette features of the clinical presentation. The new term also has the advantage of being clearly distinguishable from *tic-related OCD* and *intentional repetitive behavior*, terms that focus more on the presence and nature of particular behaviors rather than on broader pathological processes involved (i.e., repetitive behaviors of types commonly associated with OCD but driven largely by experiences of sensory discomfort typically associated with TD). Finally, the TOCD term may also promote greater interest in research on the OCD and TD interface, an arena that has had only minimal impact on standard clinical practice.

From the standpoint of clinical use, there are significant benefits to subsuming these characteristics into a single, well-defined syndrome based on clinical phenomenology. O'Sullivan et al. (2000) argue that phenomenological analysis of OCD spectrum disorders, including TD, can facilitate diagnostic formulations as well as treatment planning. In this spirit, the TOCD formulation as proposed here affords clinicians the opportunity to make a differential diagnostic determination based solely on presenting clinical characteristics. Accurate information regarding personal or family history, when available, bolsters diagnostic and clinical decision making, but in clinical practice, as in clinical research, these data are often difficult or impossible to ascertain (Swerdlow, Zinner, Robert, Seacrist, & Hartston, 1999). Thus, presence or absence of a personal or family history of TD or tics would not be required for assignment to the TOCD subgroup. When TOCD is identified, the clinical quandary indicated by the frequently asked question "Is it a tic or a compulsion?" can be resolved from the new perspective: "It is a blend of the two with characteristics associated with both." More importantly, it will be argued here that such a determination will greatly enhance the likelihood that individuals who display TOCD can be more effectively treated.

As a heuristic device and conceptual framework, TOCD can do the following:

1. describe interactions between two frequently comorbid conditions,
2. emphasize the nature of the functional relationship between subjective experiences and problematic repetitive behaviors,
3. guide the process of deriving treatment com-

- ponents from the OCD and TD literature for a distinguishable subset of individuals, and
4. facilitate communication among clinicians and with patients

## **DISTINGUISHING FEATURES OF TOCD**

It has been our experience that individuals with TOCD present regularly to treatment, with a greater proportion of these being children and adolescents. Among adults the vast majority had childhood or adolescent onset of symptoms, but some developed their symptoms in early adulthood. They conform to many of the phenotypic distinctions reviewed by Leckman, McDougle, et al. (2000) in their description of tic-related OCD. TOCD patients often report a relative absence of elaborated obsessions and beliefs in catastrophic consequences, although they may report vague notions that something bad might happen if they do not perform compulsions. In addition, they frequently report explicit concerns that their discomfort will be intolerable and possibly unending if their compulsions are not performed. Compulsions themselves typically involve just-right or just-so requirements with an emphasis on symmetry, arrangement, positioning, evening up, ordering, touching, and numbers. A number of these elements (e.g., preoccupation with numbers) may be found among arrays of symptoms in purer forms of OCD. However, these tend to be relatively minor elements in larger and more elaborate obsessional systems in which anxiety derives from specified catastrophic consequences (e.g., washing hands a set number of times to protect against AIDS). In TOCD, compulsions reportedly are not associated with anxiety but with sensory phenomena such as localized physical tension, generalized somatic discomfort, and diffuse psychological distress (such as feelings of incompleteness). The performance of compulsions tends to serve the express purpose of reducing the focal, localized, or general discomfort as opposed to playing a more central role in the modulation of anxiety and prevention of catastrophic consequences. Elements of this formulation have been described by others such as O'Connor (2001) as cognitive tics, sensory-based rituals, sensory fulfillment, and Factor II as described by Leckman, Grice, et al. (1997).

Historical indicators for TOCD may include one or more of the following: early signs of sensory hypersensitivity (e.g., bothered excessively by clothing tags, scratchy fabrics, uneven shoe laces, confining clothes, etc.); a personal or family history of chronic or transient motor or phonic tics; multiple comorbid diagnoses including attention deficit disorder,

learning disorders, and impulse control problems; a nonresponse or weak response to SSRI monotherapy; and a nonresponse, weak, or otherwise anomalous response to exposure (E) and response prevention (RP). Contrary to other reports (see George, Trimble, Ring, Sallee, & Robertson, 1993), we would not at this time include aggressive or sexual imagery as a defining feature of TOCD given our impression that the vast majority of TOCD individuals we have seen have not reported these symptoms.

The following three case studies illustrate several ways in which TOCD manifests itself. No individual symptoms are pathognomonic of TOCD; however, a distinguishable array of symptoms is identifiable in each case. These symptoms include

1. pronounced touching, tapping, and repeating behaviors that serve an identifiable function of relieving somatic discomfort or vague psychological distress,
2. a preoccupation with unrelenting discomfort for nonperformance of the repetitive behaviors, and
3. the presence of unelaborated obsessional themes.

As these cases demonstrate, TOCD may manifest itself in the absence of a personal or family history of TD or chronic tic disorders (Case 1). Conversely, the TOCD syndrome may also present in the context of TD (Case 2). These patients may carry separate diagnoses of TD and OCD, although the phenomenological presentation of OCD symptoms conforms to the TOCD syndrome proposed here. Finally, Case 3 illustrates how the TOCD conceptualization can be applied to a subset of presenting OCD symptoms.

## CASE 1

A 17-year-old male adolescent reported being bothered by the urge to touch or tap various objects until it felt right. The discomfort experienced was described less as anxiety and more as generalized discomfort “in my head” and “in the tips of my fingers.” For example, the patient felt compelled to repeatedly turn the ignition key in the car until the pressure in his fingers was relieved. In addition, he frequently had to retouch objects until they felt right and had to repeat various behaviors such as turning off light switches or placing objects down a certain number of times (that often changed) until the just-right feeling was attained. The patient reported no elaborated catastrophic fears if he did not perform the compulsions but did express the belief

that the sensations would be impossible to bear and would “drive me crazy all day long” if he did not perform the associated compulsions. There was no personal or family history of chronic tics; however, mild transient tics (throat-clearing and blinking) and notable exacerbation of OCD symptoms appeared following a trial on stimulant medication. Tics ceased, and OCD symptom severity returned to prior levels on withdrawal of medication. Childhood history included frequent streptococcal infections, impulsivity and attention deficit disorder, aggressive outbursts, and possible sensory hypersensitivity involving food and clothing textures. The patient responded poorly to sertraline in standard doses and only moderately well to E/RP. However, dramatic improvement in symptoms occurred following a trial of clonidine and with further behavioral treatments that included E/RP augmented by differential muscle relaxation.

## CASE 2

A 10-year-old boy presented with repeated excoriation of his forehead in response to words that rhymed with, or reminded the patient of, toilet behavior. The patient would grunt and scratch his forehead (at times until it bled) in response to words such as *to* (rhymed with *do* and was associated with *doo-doo*) and *party* (associated with *potty*). This excoriating behavior did not occur randomly but was emitted consistently in the presence of a finite set of auditory and visual word cues. The patient reported little voluntary control of the behavior and reported no elaborated obsessional themes related to nonperformance of the self-injurious behavior. The patient had been diagnosed with TD prior to his arrival at the clinic in addition to substantial language delays, learning disabilities, OCD, and possible pediatric autoimmune neuropsychiatric disorders associated with strep. The patient was medicated on 150mg of fluvoxamine with no observable reduction in the intensity or frequency of the excoriating behavior. During the course of 6 months, the patient received E/RP in addition to a change in medications from fluvoxamine to guanfacine in standard doses. The guanfacine reduced the intensity of the excoriating behavior and allowed for successful E/RP. In short, the patient was presented with the taboo words at a rate faster than he could emit the repetitive behavior. In time, this procedure produced substantial improvement; the patient's parents reported a 90% reduction in the excoriating behavior that subsequently evolved into an occasional, subtle waving motion that was no longer self-injurious. The patient had maintained gains at a 6-month follow-up.



## CASE 3

A 21-year-old woman presented to the clinic substantially impaired by freezing and repeating behaviors that were time-consuming and exhausting. In a variety of contexts, the patient felt compelled to pause and repeat a motion until the tension in her hand and arm felt right. For example, these behaviors occurred while attempting to screw on bottle tops, put down objects, put on clothing, and close doors and windows. The patient reported that the troublesome behaviors were associated with vague notions such as “bad things might be happening to my parents” approximately 50% of the time. The remaining 50% of the time, the patient reported that she was unaware of any specific concerns but felt compelled to engage in the behavior because of specific discomfort in various body parts or more general discomfort “in my head.” The patient reported no personal or family history of TD or chronic tic disorders. Childhood history was unremarkable for attention problems, learning disabilities, impulsivity or sensory hypersensitivity. Substantial improvement in symptoms occurred following prolonged exposure sessions in which the patient was required to practice many behaviors in just-wrong ways until the reported discomfort abated. For example, the patient was instructed to close doors repeatedly with a speed and pressure that felt maximally wrong. In addition, rote practice was incorporated that involved picking up and putting down objects slowly while relaxing the tension in her arms and practicing diaphragmatic breathing concurrently.

## ANALYSIS

In each case, the question may arise as to whether the behaviors that relieve the tension are tics (simple or complex) or are technically compulsions. A growing body of research has begun to address this question by differentiating OCD-repetitive behaviors from Tourette's and tic-related behaviors (Cath, Spinhoven, Hoogduin, et al., 2001; George et al., 1993; Holzer et al., 1994; Miguel, Baer, et al., 1997; Miguel, Coffey, Baer, Savage, Rauch, & Jenike, 1995; Miguel, Rosario-Campos, et al., 2000). Collectively, these studies report more cognitive and affective phenomena associated with OCD as well as more contamination concerns and cleaning compulsions. OCD in the context of Tourette's or tics alone was associated more with sensory phenomena as well as more touching, tapping, and repeating behaviors. However, as Miguel, Coffey, et al. (1995) note, such discriminations do not distinguish between mutually exclusive diag-

nostic categories. Some individuals with OCD and Tourette's or tics will report contamination concerns and cleaning compulsions. Conversely, some individuals with OCD alone will report compulsions that involve repetitive touching, tapping, and repeating behavior with a relative absence of cognitive and affective components.

Arguably, the distinction between OCD-related phenomena and Tourette's-related phenomena is often too difficult if not impossible to make, even by clinicians well versed in this literature. This difficulty may arise, in part, because the symptoms manifested in a subgroup of individuals (i.e., those with TOCD) may in fact represent the same phenomenon. Cath, Spinhoven, Van Woerkom, et al. (2001) identify this possibility by noting that “the suggestion that the GTS [Gilles de la Tourette's Syndrome] plus OCD subjects constitute yet another subgroup distinct from GTS and from OCD can not be excluded” (p. 226). As such, conceptualization of these cases as a blend of both tics and compulsions may temporarily resolve the question of whether a particular behavior represents a tic or a compulsion. Viewed as a blend, the TOCD classification obviates the need to place patients in discrete TD or OCD diagnostic camps, thus limiting treatment options.

## TREATMENT IMPLICATIONS OF TOCD

Many TOCD patients are at risk of being treated pharmacologically and psychotherapeutically as run-of-the-mill OCD patients. However, these patients are more difficult to treat and may be more susceptible to premature termination or to be labeled as *treatment refractory*. As such, these patients require special consideration, both pharmacologically and psychotherapeutically.

## PHARMACOLOGICAL INTERVENTIONS

Clinicians working with TOCD patients are advised to coordinate the patient's care with psychiatry to advocate for pharmacological changes to the patient's medication regimen when it is necessary to do so. TOCD patients are likely to benefit more from SSRI augmentation with low-dose neuroleptics or alpha 2 agonists, neuroleptic monotherapy, or alpha 2 monotherapy than typical OCD patients. It has been our experience that psychiatrists routinely coadminister low-dose neuroleptics with SSRI's when overt tics are present. However, adjunctive treatment with alpha 2 agonists, such as clonidine or guanfacine, are less frequently considered, particularly in the absence of motor or phonic tics. Likewise, the addition of low-dose neurolep-

tics may not be considered in the absence of tics. TOCD patients are likely to benefit more when psychiatrists conceptualize their cases as involving TD rather than strictly a resistant subtype of OCD.

## PSYCHOTHERAPEUTIC INTERVENTIONS

Clinicians working with TOCD patients likely will need to employ a modified approach to E/RP and incorporate adjunctive techniques to produce maximal treatment gains. TOCD patients are likely to experience more varied and anomalous responses to standard E/RP procedures. Some patients require substantial rote practice engaging in the just-wrong versus the just-right behavior before they experience any reduction in tension. As such, the clinician and the patient must be prepared for a longer regimen of E/RP. With persistence, reductions in uncomfortable feelings and sensations will occur. Less frequently, patients may experience an anomalous response in which relatively few repetitions of the just-wrong behavior produces a surprisingly quick reduction in tension and a rapid normalization of behavior.

In addition, E/RP is likely to benefit from augmentation with muscle relaxation techniques, imagery, diaphragmatic breathing, and substitution strategies. Muscle relaxation techniques may be used strategically to reduce overall arousal levels and as a tactical procedure (i.e., differential relaxation) employed to relieve focal or more general somatic tension associated with nonperformance of the repetitive behaviors. Likewise, imagery techniques and diaphragmatic breathing may be used alone or in conjunction with E/RP. TOCD patients may be asked to imagine the tension leaving their body or to focus on breathing away the tension. Substitution strategies may also be employed to help discharge an urge, for example rubbing away tense feelings in a particular body part as elements of habit-reversal training might do (Azrin & Nunn, 1973). A patient might for example practice stretching both arms away from an object he feels compelled to touch (i.e., use a competitive motor response) at critical times during E/RP.

Treatment with E/RP may not produce the significant reductions in obsessions and compulsions that are characteristic of treatment results with typical OCD patients. However, E/RP may produce reductions in symptoms if the treatment is sustained for longer periods of time and focuses more heavily on rote practice of therapeutic skills. Additional problems may arise in cases where the repetitive behaviors are not under sufficient degrees of stimulus control, and it is therefore difficult or impossible to generate the discomfort in the clinical

context. In these cases, therapy of necessity must rely on patient-managed E/RP. Child and adolescent cases may require home visits to address specific issues. Moreover, parents or caretakers may need to be taught E/RP tactics to help facilitate change in these younger clients.

In our experience, TOCD cases require greater measures of willingness to adopt an experimental posture within the therapeutic process. The nurturance of a truly collaborative relationship between therapists and even their youngest patients will maximize the chances of developing the right combination of therapeutic ingredients for successful treatment. Finally, given the increased challenge of treating these patients, the treatment plan will often require augmentation with family therapy, school consultations, and supportive psychotherapy to address the peripheral problems so often associated with TOCD cases.

## CONCLUSION

At this time, we would argue that there are practical benefits to be derived from the adoption of a clearly defined TOCD classification by clinicians. A significant number of patients who present with this atypical array of symptoms could be easily distinguished and identified. From that point, clinicians would be directed to potentially effective therapeutic components that otherwise might be overlooked in favor of standard OCD or TD treatments.

Questions may be raised as to how well this proposed formulation will stand up to scientific scrutiny. Information derived from research endeavors such as family genetic studies may suggest an appropriate diagnostic placement for individuals described here. Furthermore, the implications drawn here regarding neurological underpinnings, and effective therapeutic components, both pharmacological and behavioral, should be subjected to further empirical examination. Additional empirical research questions include whether the TOCD conceptualization will hold up as a heuristic: Is it valid? Can TOCD patients be distinguished reliably from TD and OCD? What is the best way of identifying TOCD? Will this conceptualization lead to more successful treatments? Is a new diagnostic category warranted?

Specific studies that will help determine the answers to these questions can begin with the development of an assessment device that includes items to discriminate features unique to TOCD from pure OCD and TD features. A large sample study should then be conducted to determine whether TOCD can reliably be discriminated from OCD

and TD. Further down the line, studies examining family history, personal history, course, treatment response and prognosis would be important in validating the TOCD construct.

## REFERENCES

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Azrin, N. H., & Nunn, R. G. (1973). Habit reversal: A method of eliminating nervous habits and tics. *Behavior Research & Therapy*, 11, 619–628.
- Azrin, N. H., & Peterson, A. L. (1988). Behavior therapy for Tourette's syndrome and tic disorders. In D. J. Cohen, R. D. Bruun, & J. F. Leckman (Eds.), *Tourette's syndrome and tic disorders* (pp. 237–256). New York: Wiley.
- Baxter, L. R., & Guze, B. A. (1992). Neuroimaging. In R. Kurlan (Ed.), *Handbook of Tourette's syndrome and related tic and behavioral disorders* (pp. 289–304). New York: Dekker.
- Bruun, R. D. (1988). The natural history of Tourette's syndrome. In D. J. Cohen, R. D. Bruun, & J. F. Leckman (Eds.), *Tourette's syndrome and tic disorders* (pp. 21–40). New York: Wiley.
- Castellanos, F. X. (1998). Tic disorders and obsessive-compulsive disorder. In T. B. Walsh (Ed.), *Child psychopharmacology* (p. 1–28). Washington DC: American Psychiatric.
- Cath, D. C., Spinhoven, P., Hoogduin, C. A. L., Landman, A. D., Van Woerkom, T. C. A. M., Van de Wetering, B. J. M., et al. (2001). Repetitive behaviors in Tourette's syndrome and OCD with and without tics: What are the differences? *Psychiatric Research*, 101, 171–185.
- Cath, D. C., Spinhoven, P., Van Woerkom, T. C. A. M., Van de Wetering, B. J. M., Hoogduin, C. A. L., Landman, A. D., et al. (2001). Gilles de la Tourette's syndrome with and without obsessive compulsive disorder compared with obsessive-compulsive disorder without tics: Which symptoms discriminate? *Journal of Nervous and Mental Disease*, 189, 219–228.
- Como, P. (1995). Obsessive-compulsive disorder in Tourette's syndrome. In W. Weiher & A. E. Land (Eds.), *Behavioral neurology of movement disorders* (pp. 281–291). New York: Raven.
- Delgado, P. L., Goodman, W. K., Price, L. H., Heninger, G. R., & Charney, D. S. (1992). Fluvoxamine/pimozide treatment of concurrent Tourette's and obsessive-compulsive disorder. *British Journal of Psychiatry*, 157, 762–765.
- Geller, D. A. (1998). Juvenile obsessive-compulsive disorder. In M. A. Jenike, L. Baer, & W. E. Minichiello (Eds.), *Obsessive-compulsive disorders: Practical management* (pp. 44–64). St. Louis, MI: Mosby.
- George, M. S., Trimble, M. R., Ring, H. A., Sallee, F. R., & Robertson, M. M. (1993). Obsessions in obsessive-compulsive disorder with and without Gilles de la Tourette's syndrome. *American Journal of Psychiatry*, 150, 93–96.
- Holzer, J. C., Goodman, W. K., McDougle, C. J., Baer, L., Boyarsky, B. K., Leckman, J. F., & Price, L. H. (1994). Obsessive-compulsive disorder with and without a chronic tic disorder: A comparison of symptoms in 70 patients. *British Journal of Psychiatry*, 164, 469–473.
- Leckman, J. F. (1993). Tourette's syndrome. In E. Hollander (Ed.), *Obsessive-compulsive related disorders* (pp. 113–137). Washington, DC: American Psychiatric.
- Leckman, J. F., Goodman, W. K., Anderson, G. M., Riddle, M. A., Chappell, P. B., & Swiggen-Hardin, M. T. (1995). Cerebrospinal fluid biogenic amines in obsessive-compulsive disorder, Tourette's syndrome, and healthy controls. *Neuropsychopharmacology*, 12, 73–86.
- Leckman, J. F., Grice, D. E., Boardman, J., Zhang, H., Vitale, A., Bondi, C., et al. (1997). Symptoms of obsessive-compulsive disorder. *American Journal of Psychiatry*, 154, 911–917.
- Leckman, J. F., McDougle, C. J., Pauls, D. L., Peterson, B. S., Grice, D. E., King, R. A., et al. (2000). Tic-related versus non-tic-related obsessive-compulsive disorder. In W. K. Goodman, M. V. Rudorfer, & J. D. Maser (Eds.), *Obsessive-compulsive disorder: Contemporary issues in treatment* (pp. 43–68). Mahwah, NJ: Lawrence Erlbaum.
- Leonard, H. L., Lenane, M. C., Swedo, S. E., Rettew, D. C., Gershon, E. S., & Rapoport, J. L. (1992). Tics and Tourette's disorder: A 2- to 7-year follow-up of 54 obsessive-compulsive children. *American Journal of Psychiatry*, 149, 1244–1251.
- March, J. S., Frances, A., Carpenter, D., & Kahn, D. A. (Eds.). (1997). The expert consensus guideline series: Treatment of obsessive-compulsive disorder. *Journal of Clinical Psychiatry*, 58 (Suppl. 4), 65–72.
- March, J. S., & Mulle, K. (1998). *OCD in children and adolescents: A cognitive-behavioral treatment manual*. New York: Guilford.
- Miguel, E. C., Baer, L., Coffey, B. J., Rauch, S. L., Savage, C. R., O'Sullivan, R. O., et al. (1997). Phenomenological differences appearing with repetitive behaviours in obsessive-compulsive disorder and Gilles de la Tourette's syndrome. *British Journal of Psychiatry*, 170, 140–145.
- Miguel, E. C., Coffey, B. J., Baer, L., Savage, C. R., Rauch, S. L., & Jenike, M. A. (1995). Phenomenology of intentional repetitive behaviors in obsessive-compulsive disorder and Tourette's disorder. *Journal of Clinical Psychiatry*, 56, 246–255.
- Miguel, E. C., Rosario-Campos, M. C., Silva Prado, H., Valle, R., Rauch, S. L., Coffey, B. J., et al. (2000). Sensory phenomena in obsessive-compulsive disorder and Tourette's disorder. *Journal of Clinical Psychiatry*, 61, 150–156.
- O'Connor, K. P. (2001). Clinical and psychological features distinguishing obsessive-compulsive and chronic tic disorders. *Clinical Psychology Review*, 21, 631–660.
- O'Sullivan, R. L., Mansueto, C. S., Lerner, E. A., & Miguel, E. C. (2000). Characterization of trichotillomania: A phenomenological model with clinical relevance to obsessive-compulsive spectrum disorders. *Psychiatric Clinics of North America*, 23, 587–604.
- Pauls, D. L. (1992). The genetics of obsessive-compulsive disorder and Gilles de la Tourette's syndrome. In M. A. Jenike (Ed.), *Psychiatric clinics of North America* (pp. 759–766). Philadelphia: Sanders.
- Pauls, D. L., Alsobrook, J. P., Goodman, W., Rasmussen, S., & Leckman, J. F. (1995). A family study of obsessive-compulsive disorder. *American Journal of Psychiatry*, 152, 76–84.
- Pitman, R. K., Green, R. C., Jenike, M. A., & Mesulam, M. M. (1987). Clinical comparison of Tourette's disorder and obsessive-compulsive disorder. *American Journal of Psychiatry*, 144, 1166–1171.
- Swerdlow, N. R., Zinner, S., Robert, F. H., Seacrist, C., & Hartston, H. (1999). Symptoms in obsessive-compulsive disorder and Tourette's syndrome: A spectrum? *CNS Spectrums*, 4, 21–33.
- Towbin, K. E. (1988). Obsessive-compulsive symptoms in Tourette's syndrome. In D. C. Cohen, R. D., Bruun, & J. F. Leckman (Eds.), *Tourette's syndrome & tic disorders* (pp. 137–150). New York: Wiley.

## NOTES