

UPDATE ARTICLE

Tourette and tic disorders in ICD-11: standing at the diagnostic crossroads

Douglas W. Woods,¹ Per H. Thomsen²

¹Psychology Department, Texas A&M University, College Station, TX, USA. ²Centre for Child and Adolescent Psychiatry, Aarhus University Hospital, Risskov, Aarhus, Denmark.

This article reflects discussion by the WHO ICD-11 Working Group on the Classification of Obsessive-Compulsive and Related Disorders. After reviewing the historical classification of tic disorders, this article discusses their placement in ICD-11. Existing problems with diagnostic labels and criteria, appropriate placement of the tic disorders category within the ICD-11 system, and pragmatic factors affecting classification are reviewed. The article ends with recommendations to (a) maintain consistency with the DSM-5 diagnostic labels for tic disorders, (b) add a minimum duration guideline for a provisional tic disorder diagnosis, (c) remove the multiple motor tic guideline for the diagnosis of Tourette disorder, and (d) co-parent the tic disorder diagnoses in the disorders of the nervous system and the mental and behavioral disorders categories, with secondary co-parenting in the obsessive-compulsive and related disorders and neurodevelopmental disorders sections.

Keywords: Tourette disorder; diagnosis and classification; obsessive-compulsive disorder; neurology; behavioral neurology

Introduction

This article reviews the current diagnostic status of tic disorders in the ICD-10¹ and the DSM-IV,² as well as problems created by the existing structures, and describes the DSM-5 classification for tic disorders, along with various options for classification in the upcoming ICD-11. The paper closes with recommendations for the ICD-11 classification of tic disorders.

Historical background

Since the recognition of Tourette syndrome and related tic disorders as distinct syndromes, the appropriate home for their classification has been debated. In 1885, a French physician, Gilles de la Tourette, described the condition that would ultimately bear his name. In his initial description, Gilles de la Tourette noted many of the features that reflect the modern understanding of the disorder. He noted its childhood onset, presence of both motor and vocal symptoms, male preponderance, waxing and waning of symptoms, the heritability of the condition, and the ability of treatment to manage, but not cure, symptoms.³ Interestingly, 12 years before Gilles de la Tourette described the syndrome, another French physician, Armand Trousseau, also noted a condition that involved repetitive motor and vocal tics.⁴ Although both men described a condition in which the “mental status” of the patients was relatively normal, Trousseau described a

chronic condition that was focused primarily on motor and vocal tic symptoms. He noted that the tics could occur in “infinite” forms, often changed location, were hereditary, and that parents and other family members of persons with these disorders often experienced “different neuroses.” Nevertheless, his description focused primarily on the tic symptoms. In contrast, Gilles de la Tourette viewed the disorder as more complicated, emphasizing to a much greater degree the symptoms of coprolalia and echolalia/echopraxia. Likewise, he initially believed the disorder to be degenerative and was criticized by colleagues for not separating true “neurologic” symptoms from those brought about by other psychiatric conditions.⁵

From these initial biological interpretations of the disorder, Meige & Feindel began to include traditional psychiatric factors to enhance its understanding, noting that “the first manifestations of tic have their origin in and are dependent on, cortical activity...” (p. 49), and that “consensus of opinion admits diminution of will power to be the cardinal mental symptom of the tic patient” (p. 55).⁶ Essentially, Meige & Feindel suggested that tics were brought on by the repetition of a motoric action that eventually became habitual, but could not be stopped because the patient lacked the strength of will to do so, a weakness they attributed to parenting. As Meige & Feindel stated, “Exercise of the will can check the convulsive movement, but it is unfortunately in will power that the patient is lacking (p. 74)... for tics, generally speaking, are nothing more than bad habits, which, in the absence of all restraining influence, negligence and weakness on the side of the parents have allowed to degenerate into veritable infirmities (p. 77).”

Correspondence: Douglas W. Woods, 4235 TAMU, Texas A&M University, College Station, TX, USA, 77843.
E-mail: dowoods@tamu.edu

Meige & Feindel⁶ went even further, suggesting that some of the other behavioral problems that frequently co-occurred with tics, conditions similar to modern day attention deficit hyperactivity disorder (ADHD) and obsessive-compulsive disorder (OCD), were in part due to the same underlying “mental instability” that caused tics. For example, they stated that “mental instability is not uncommonly associated with a general restlessness and fidgetiness during intervals of respite from the actual tics” (p. 81). Likewise, they observed, “... if we compare the psychical stigmata of obsessional patients – the asymmetry of their mental development, their intellectual inequalities and lack of harmony, their alternating excitability and depression, their unconventionalities, eccentricities, and imaginativeness, their timidity, whimsicalness, sensitiveness, and all the other indications of a psychopathic constitution – if these are compared with the mental equipment of the sufferer from tic, we cannot but notice intimate analogies between the two, analogies corroborated by a glance at their symptomatology” (p. 83).⁶

Researchers have always recognized the neurological basis of Tourette disorder, but the influence of psychiatric/psychological factors on symptom expression and as a part of the presentation of this disorder has varied. Interestingly, this continues today. In the DSM-5, Tourette disorder is defined simply as a cluster of motor and vocal tics⁷; yet, others suggest that Tourette disorder occurs along a spectrum ranging from relatively benign motor and vocal tics to a complex cluster of psychiatric conditions that includes motor and vocal tics along with copro- and echophenomena, ADHD, and obsessive-compulsive features.⁸

Perhaps due to the varied ways in which it has been conceptualized, Tourette disorder has not been easily classified. After the initial description by Gilles de la Tourette, it was adopted primarily as a psychogenic illness and viewed through a psychodynamic/psychoanalytic lens.⁹ However, after antipsychotic medications were found to be effective in the management of Tourette disorder,¹⁰ the neurobiological basis of the disorder became the dominant model. In more recent years, the conceptualization of Tourette disorder as a biologically based condition that is highly influenced by psychosocial factors has emerged, given the growing research demonstrating the efficacy of behavioral approaches for the treatment of tics.¹¹ Of course, the efficacy of a particular mode of treatment should not be viewed as evidence of a disorder’s cause, but with the discovery that different modalities of treatment could be effective, the broad factors seen as impacting symptoms have changed, and this has resulted in various approaches to classification. Diagnostically, tics were included in the first version of the DSM, though they were categorized as “neurotic traits” and viewed as a symptom of an underlying neurosis.¹² In the more recent revisions of the DSM, tic disorders have been divorced from their presumed causes in the classification structure. Tics were listed in multiple categories of ICD-6,¹³ and, ever since, tic disorders have been classified continuously within both the DSM and ICD systems.

Summary of ICD-10 approaches

The ICD-10 and DSM-IV approaches to the classification of tic disorders were largely similar.² With the exception of tics due to drug use, tic disorders were placed in the mental and behavioral disorders category of ICD-10. ICD-10 utilized the following diagnostic labels for the various tic disorders: transient tic disorder; chronic motor and/or vocal tic disorders; combined vocal-multiple motor tic disorder (Tourette disorder); other tic disorder; and tic disorder, unspecified.

Comparison of DSM-IV, ICD-10, and DSM-5 approaches

Table 1 provides a comparison of the tic disorder diagnoses in DSM-IV,² DSM-5,⁷ and ICD-10.¹ In DSM-IV,² Tourette disorder and other tic disorders were placed in the diagnostic grouping of “disorders usually first diagnosed in infancy, childhood, or adolescence.” Thus, tic disorders shared their diagnostic umbrella with other categories, such as mental retardation, learning disorders, ADHD, elimination disorders, autism and other pervasive developmental disorders (PDD), and feeding disorders. Within the tic disorder category, DSM-IV outlined four specific tic disorders: transient tic disorder; chronic motor or vocal tic disorder; Tourette disorder; and tic disorder, not otherwise specified (NOS). Overall, DSM-IV and ICD-10 were very similar in their types of tic disorder diagnoses, as well as in the specific criteria/guidelines for diagnosis. Placed in the primary parent category of mental and behavioral disorders within the ICD-10, tic disorders were in the subcategory of behavioral and emotional disorders with onset usually occurring in childhood and adolescence. Other disorders in this subcategory included, but were not limited to, hyperkinetic disorders, conduct disorders, separation anxiety disorder of childhood, sibling rivalry disorder, elimination disorders, elective mutism, reactive attachment disorder, pica, stuttering, and cluttering.

DSM-5 made relatively few substantive changes with respect to the DSM-IV tic disorders category. Although the DSM-5 retained the concepts of transient tic disorder, chronic motor/vocal tic disorder, Tourette disorder, and tic disorder NOS, the labels used for these disorders differed slightly from those of DSM-IV. In particular, DSM-5 changed the name of transient tic disorder to provisional tic disorder, and chronic motor/vocal tic disorder became persistent motor or vocal tic disorder. In addition, the DSM-5 added categories of substance-induced tic disorder and tic disorder due to a general medical condition.

Issues considered for ICD-11

From the Working Group’s perspective, there were various problems with respect to the ICD-10 guidelines and DSM-IV diagnostic criteria for tic disorders. Some of these were addressed with the DSM-5, but some were either not addressed or addressed in a way that led to unresolved issues. Each of these issues is described below. The article ends with recommendations for ICD-11 and the rationale for those recommendations.

Table 1 Differences between DSM-IV, DSM-5, ICD-10, and proposed ICD-11 categories and labels for tic disorders

	Labels	Parent category
DSM-IV	Tourette's disorder; chronic motor or vocal tic disorder; transient tic disorder; tic disorder not otherwise specified	Disorders of infancy, childhood, & adolescence
ICD-10	Combined vocal and multiple motor tic disorder (de la Tourette); chronic motor or vocal tic disorder; transient tic disorder; other tic disorders; tic disorder, unspecified	Behavioral and emotional disorders with onset usually occurring in childhood and adolescence
DSM-5	Tourette's disorder; persistent (chronic) motor or vocal tic disorder provisional tic disorder; other specified tic disorder; unspecified tic disorder	Neurodevelopmental disorders
ICD-11 (proposed)	Tourette syndrome (combined vocal and motor tic disorder); persistent (chronic) motor or phonic tics; provisional tic disorder; substance-induced tic disorder; tic disorder due to general medical condition	Disorders of nervous system – primary; mental and behavioral disorders – secondary; obsessive-compulsive and related disorders; neurodevelopmental disorders

Problems with definitions

With respect to ICD-10, aspects of the diagnostic labels and some of the diagnostic guidelines were problematic. The first problem involved the transient tic disorder diagnosis. Two issues emerge with the diagnosis of transient tic disorder. First, the term “transient” is problematic, as it implies tics will last only a short time and that the problem will pass. Second, the diagnosis can only be rendered accurately *ex post facto*. Under current guidelines, tics must be present for less than 1 year to receive a transient tic disorder diagnosis. However, the clinician cannot know whether this is true until at least 1 year has passed. If tics had come and gone within that year, then a transient tic disorder would have been appropriate. However, if the tics were still present at the end of the year, then the diagnosis would either be Tourette disorder or chronic motor/vocal tic disorder. The label “transient” is misleading and uninformative with respect to predicting the potential course of illness, and does not appear to convey useful clinical information, except that the person has tics.

A second problem involves the amount of time for which patients were required to exhibit symptoms before being diagnosed with transient tic disorder. In DSM-IV,² symptoms had to be present for at least 4 weeks before transient tic disorder could be diagnosed.² The 4-week criterion was arbitrary, and, perhaps for that reason, neither ICD-10,¹ nor DSM-5⁷ required it. Nevertheless, there may be a good reason for ICD-11 to include a minimum duration guideline. Tics are quite common and truly transient in young children. Estimates suggest that as many as 20% of school-aged children may exhibit tics.¹⁴ Under the current diagnostic guidelines of ICD-10 or DSM-5, a child who exhibits hard eye-blinking over 1 or 2 days could be diagnosed with either transient or provisional tic disorder. Having a minimum duration could preclude the overdiagnosis of tic disorder in children.

A third problem involves the temporal distribution of tics required in DSM-IV for diagnoses of Tourette disorder and chronic motor/vocal tic disorder. Specifically, both

disorders require that tics occur for at least 1 year, but that there not be a tic-free period of more than 3 consecutive months. This is problematic, because tics wax and wane. As a result, there may be periods of greater than 3 months in which tics become imperceptible or completely absent. ICD-10 did not include this as a guideline, and DSM-5 eliminated it, but it is an issue the ICD-11 revision must consider.

A fourth problem involves the criteria for Tourette disorder. In DSM-IV, DSM-5, and ICD-10, the minimum criteria for a diagnosis requires multiple motor tics and at least one vocal tic. However, it is unclear why these criteria were chosen. The primary feature that sets Tourette disorder apart from the chronic motor or vocal tic disorder is the presence of both motor and vocal symptoms. Most patients with Tourette exhibit multiple motor and vocal tics, but should a patient exhibit one motor tic and five vocal tics, or one motor and one vocal tic, for example, he or she would not have a Tourette diagnosis when adhering strictly to criteria. The requirement that multiple motor tics exist seems arbitrary and unnecessarily exclusive.

The final question regarding the diagnostic guidelines is whether chronic motor or vocal tic disorders should be separate from Tourette disorder. One could argue that the distinction between vocal and motor tics is arbitrary and that, ultimately, all tics involve movement (i.e., sound is not possible without movement). In addition, some data suggest that chronic motor/vocal tic disorder and Tourette disorder are similar with respect to general psychiatric comorbidity as well as neuropsychological and psychosocial impairments.¹⁵ Nevertheless, data also suggest that individuals with chronic motor/vocal tic disorder and Tourette disorder differ in rates of co-occurring OCD, oppositional defiant disorder (ODD), and simple phobias,¹⁵ with those in the Tourette disorder group exhibiting higher rates.

In addition, recent factor analysis findings suggest that differentiating the disorders on the basis of tic complexity may have greater predictive power. For example, Mathews et al.¹⁶ delineated two tic symptom clusters (simple tics

and complex tics) and found that the complex cluster was much more highly related to greater tic severity, impairment, and comorbid OCD. Interestingly, a third factor analytic study¹⁷ also found factors that separated out more simple tics from what could be considered more complex tics. Conducted in the context of a heritability study, this research showed that the simple tic factor was unrelated to ADHD and OCD in first-degree relatives of the Tourette-affected probands, but the complex tic factor was related to ADHD and OCD in the relatives.

Appropriate placement within the ICD system

Among the WHO ICD-11 Working Group on the Classification of Obsessive-Compulsive and Related Disorders, there was little disagreement regarding the retention of DSM-5 tic disorder diagnostic labels for incorporation into ICD-11. Rather, the primary questions for ICD-11 had to do with the appropriate parent categories in which the tic disorders group should be housed. In making these decisions, one must consider that the purpose of the ICD-11 is to ensure that disorders and diseases be effectively recognized and treated. As such, guidelines need to be clear, and categorization of disorders needs to be arranged effectively so those health care professionals most likely to contact and treat persons with these disorders are able to recognize them.

Tic disorders exist at the crossroads of neurology and psychiatry. Furthermore, within psychiatry, these disorders are often viewed as either a neurodevelopmental disorder, existing in the same diagnostic category as ADHD and autism, or as disorders more similar to those in the obsessive-compulsive spectrum. From a purely scientific perspective, strong reasons exist to categorize tic disorders into any of the aforementioned groupings. Clearly, tic disorders involve disordered movement resulting from dysregulated brain circuitry that is widely involved in many other movement disorders.¹⁸ For this reason, classification as a neurological disorder is appropriate. However, it is also well understood that tic disorders have features that are unlike those of many other movement disorders (i.e., premonitory urges, controllability, etc.), are highly influenced by behavioral factors,¹⁹ and frequently co-occur with a number of other psychiatric disorders, thus making classification as a psychiatric disorder appropriate.

Within the context of psychiatric classification, tic disorders historically have been classified as a developmental disorder, in the same category as ADHD, Asperger's disorder, autism, and elimination disorders. Indeed, there are good reasons for this grouping. Tic disorders almost always have a childhood onset, and, arguably, the most common psychiatric comorbidity in persons with tic disorders is ADHD. Furthermore, tic disorder rates are much higher in children with autism spectrum disorders,²⁰ and some research suggests that response inhibition deficits, a problem shared by persons with ADHD, exist in children with tic disorders.²¹

Nevertheless, the existing data are not entirely consistent with the notion that tic disorders should be

grouped in with the other neurodevelopmental disorders. Although there is a generally higher prevalence of PDD in the Tourette disorder population (i.e., ~5% of Tourette disorder population may have some form of PDD),²² this research is limited and often does not control for the fact that ADHD, frequently comorbid with Tourette disorder, confers a documented increase in risk for a PDD diagnosis.²³ In fact, outside of the comorbidity with ADHD, there is little evidence that the incidence or prevalence of many other neurodevelopmental disorders is higher in children with tic disorders. For example, mental retardation and learning disorders appear to be no more common in children with Tourette disorder than in normal children,²⁴ nor are elimination disorders, stuttering, or other language disorders more common in the Tourette disorder population.²⁵ More recent data even suggest that ADHD may not be the most common comorbid psychiatric disorder in persons with Tourette disorder²⁶; studies showing that response inhibition is a core deficit in children with tic disorders have not been uniformly replicated, and some research suggests the response inhibition deficits found in the Tourette population may be due to the presence of comorbid ADHD rather than a deficit specific to tic disorders.²⁷ Furthermore, there is little evidence that children with pure tic disorders are affected by the language and social delays that affect children with autism spectrum disorders,²⁸ and recent family genetic studies have found negligible direct heritability between tic disorders and ADHD.⁸

Credible scientific arguments can also be made for and against the placement of tic disorders in the obsessive-compulsive and related disorders (OCRD) category. From a phenomenological perspective, both tic disorders and OCD are often preceded by an uncomfortable/unpleasant internal sensation that is temporarily relieved contingent on a repetitive behavior. In the case of OCD, these events are most often cognitions or autonomic arousal, whereas in the case of tics, the phenomena are more often sensory in nature, and are called "premonitory urges."²⁹ In both cases, a repetitive behavior (compulsion in the case of OCD; tics in the case of tic disorder) serves to temporarily reduce the aversive experience.

In addition to the phenomenological similarities between tics and OCD, there are other sources of evidence supporting their co-location in the ICD-11. First, numerous studies have shown a high degree of comorbidity between Tourette disorder and OCD.²⁶ In fact, a recent large study on a community-based sample found that the most common comorbidity in children with tic disorders was OCD, not ADHD.²⁶ Second, there is strong evidence from family studies supporting the genetic link between OCD and tic disorders.³⁰ Third, recent imaging studies suggest that both OCD and tic disorders involve disruption in the corticostriatal thalamo-cortical pathways.³¹ Fourth, factor analytic studies suggest that one cluster of tic symptoms (i.e., complex tics) is highly related to OCD severity,¹⁷ and that specific clusters of OCD symptoms (e.g., symmetry) are related to tic symptoms.³² Finally, both OCD and tic disorders

respond to behavioral treatments (exposure and response prevention in OCD; habit reversal in tic disorders) that appear to share a similar mechanism of change – namely, habituation to aversive cognitive, autonomic, or sensory experiences.¹¹

Despite these arguments for including tic disorders in the obsessive-compulsive spectrum category, there are findings that argue against such a classification. First, medications often used to effectively treat OCD (i.e., selective serotonin reuptake inhibitors) are not effective in reducing tics.³³ Second, there are great differences in the ages of onset between the two disorders. Tic disorders almost always start in early childhood, whereas OCD often begins later.³⁴ Third, the two disorders tend to have different courses. Left untreated, a substantial proportion of children with tic disorders will remit after peak severity in early adolescence.³⁵ The outcome in persons with OCD is less clear. Approximately 50% of children with OCD will remit by adulthood, particularly those with a comorbid tic disorder.³⁶ However, in adult OCD, the prognosis is slightly less positive, with many improving but still retaining core symptoms of the disorder.³⁷

Overall, scientific/logical reasons exist to place tic disorders in any of the three aforementioned categories (disorders of the nervous system, neurodevelopmental disorders, and obsessive-compulsive spectrum disorders). As a result, one should also consider pragmatic reasons for appropriate classifications.

Pragmatic factors

ICD-11 considers not only the scientific appropriateness of classification, but the pragmatic effect (i.e., the clinical utility) of the classification system on the recognition and effective treatment of illness. The appropriate “home” for tic disorders may differ when viewed through such a lens. Ultimately, when considering this issue, one must look at (a) the number and type of providers available to recognize and treat the problem, (b) the other conditions that often co-occur, (c) the treatment options that exist and which types of disciplines provide such options, and (d) the effect classification may have on the perception of those with the problem. In doing so, a global perspective must be considered.

Primary care physicians are the most often the first health care professionals to see tic disorders, and have the ability to recognize the condition and either treat or refer for treatment.³⁸ If and when a referral happens, it is likely to either a neurologist or a psychiatrist. Referral to a psychologist or therapist is much less common.³⁸ For this reason, it would be beneficial for the disorder to be recognized as both a disorder of the nervous system and as a mental or behavioral health condition.

Another factor to consider involves the types of conditions that often co-occur with tic disorders. The most common co-occurring conditions include ADHD and OCD. Thus, it is important to categorize tics in such a way that care providers who may be more apt to recognize ADHD and OCD will also recognize tic disorders as a distinct diagnostic entity that may require separate

intervention. Tics can often be confused for motoric hyperactivity, and complex tics can be misdiagnosed as symptoms of OCD. However, having tic disorders appropriately categorized can ensure that specialists in ADHD and OCD at least consider the possibility of a comorbid tic disorder if appropriate.

When considering that part of the ICD’s purpose is to enhance the treatment being received around the world, it must be considered that categorization may lead to treatment accessibility or treatment practices that are more common within a particular subdiscipline. With respect to the treatment of tics, it is well understood in both neurology and psychiatry that the two most effective classes of medication for tics are alpha-2 adrenergic agonists and antipsychotics.¹⁰ There is also growing recognition that behavior therapy is an effective option.¹¹ Because psychologists may be much more likely to work alongside psychiatrists than neurologists, it is possible that categorizing tic disorders as only a disorder of the nervous system could result in fewer providers being aware of, and ultimately fewer patients benefitting from, behavior therapy for tics. Another common problem confronted by those who treat children with tic disorders is how to effectively treat the commonly co-occurring ADHD. Despite early concerns about the use of stimulant medications to treat ADHD in children with tic disorders, recent evidence suggests that such medications are typically safe and effective.³⁹ However, if a health care professional does not routinely manage ADHD symptoms, he or she may operate under a dated understanding of current ADHD treatment protocols for children with tics.

The final consideration that should be weighed is the impact classification can have on persons with the disorder. Since the early psychoanalytic interpretations of Tourette disorder,⁹ patient advocacy groups have argued that it should be conceptualized as a biologically rather than a psychologically based problem.⁴⁰ The establishment of antipsychotic medications as an effective treatment for tics was a turning point in the conceptualization of tic disorders from a psychological to a biological illness. As a result, there is concern that categorizing tic disorders as a mental or behavioral disorder in existing classification schemes may have an unexpected effect of broadly categorizing the issue as a psychological problem, and thus result in diminished healthcare benefits and further stigma for those with the condition.⁴¹

Specific tentative recommendations for ICD-11 and rationale

In weighing both empirical and pragmatic factors, the WHO ICD-11 Working Group on the Classification of Obsessive-Compulsive and Related Disorders has the following recommendations for both the content and placement of tic disorders within the revised classification.

Diagnoses included

The Working Group recommends that four tic disorders be retained, and that diagnostic labels similar to those of

DSM-5 be utilized. The four tic disorder diagnoses are provisional tic disorder, chronic motor or vocal tic disorder, Tourette disorder, and other specified tic disorder.

Diagnostic guidelines

The proposed ICD-11 diagnostic guidelines for provisional tic disorder, chronic motor or vocal tic disorder, Tourette disorder, and other specified tic disorder are listed in Table 2. As can be seen, there are two major differences between the criteria used in DSM-5 and the proposed guidelines. The first guideline establishes a minimum time frame during which symptoms should occur before a diagnosis of provisional tic disorder is given. Specifically, the Working Group recommends that ICD-11 include a minimum period of 2 weeks in which the tics have been occurring on a regular basis.

Rationale. By including a relatively short minimum time frame over which symptoms should be present, it is expected that the likelihood of overdiagnosing provisional tic disorder would diminish. Nevertheless, it is understood that this 2-week requirement is arbitrary.

The second change affects the Tourette disorder diagnosis. Specifically, the Working Group recommends the removal of the multiple motor tic guideline. Instead, it is recommended that the presence of one or more motor tics and one or more vocal tics should suffice for diagnosis of Tourette disorder.

Rationale. Although it is highly likely that a person presenting with both motor and vocal symptoms will have

multiple forms of each, the exclusion of individuals who may exhibit only one motor tic plus vocal symptoms does not seem empirically warranted and makes the ICD-11 guidelines needlessly complex with respect to a Tourette disorder diagnosis.

Placement

To enhance recognition of the disorder as well as to recognize that various types of health care professionals can effectively treat persons with tic disorders, it is recommended that the tic disorders group should have co-parent categories. Tic disorders should be categorized in the neurological disorders category as well as the mental and behavioral disorders category. Furthermore, under the mental and behavioral disorders category, the tic disorders should be categorized under both the neurodevelopmental disorders category and the OCRD category.

Conclusion

This article reviewed the current placement of tic disorders across the DSM and ICD systems. Appropriate placement, labels, and criteria for the upcoming ICD-11 were considered. After taking into account multiple factors, including problems with the diagnostic labels and criteria, appropriate placement within the ICD system, and pragmatic factors related to diagnosis, a number of recommendations were made. It

Table 2 Differences between DSM-IV-TR, DSM-5, ICD-10, and proposed ICD-11 diagnostic criteria for tic disorders

	Tourette	Persistent/chronic motor or vocal tic disorder	Provisional/transient tic disorder
DSM-IV-TR	<ul style="list-style-type: none"> - Multiple motor and one or more vocal tics at some point in illness - Tics occur daily or periodically, but > 1 year since onset, and no tic-free period of more than 3 consecutive months - Onset before 18 years - Not caused by substance or other condition 	<ul style="list-style-type: none"> - One or more motor or vocal tics present at some point, not both motor and vocal symptoms - Tics occur daily or periodically, but > 1 year since onset, and no tic-free period of more than 3 consecutive months - Onset before 18 years - Not caused by substance or other condition - No history of Tourette 	<ul style="list-style-type: none"> - One or more motor and vocal tics - Tics occur daily or periodically, but for > 4 weeks and <12 months - Onset before 18 years - Not caused by substance or other condition - No history of Tourette - Specify if single episode or recurrent
ICD-10	<ul style="list-style-type: none"> - Multiple motor and one or more vocal tics, not necessarily occurring at the same time 	<ul style="list-style-type: none"> - One or more motor or vocal tics, but not both types - Symptoms occur > 12 months 	<ul style="list-style-type: none"> - One or more motor and/or vocal tics - Symptoms occur <12 months
DSM-5	<ul style="list-style-type: none"> - Multiple motor and one or more vocal tics at some point in illness - May wax and wane, but have persisted > 1 year since onset - Onset before 18 years - Not caused by substance or other condition 	<ul style="list-style-type: none"> - One or more motor or vocal tics present at some point, not both motor and vocal symptoms - May wax and wane, but have persisted > 1 year since onset - Onset before 18 years - Not caused by substance or other condition - No history of Tourette - Specify if motor tics only, vocal tics only 	<ul style="list-style-type: none"> - One or more motor and/or vocal tics - Tics present for <1 year since onset - Onset before 18 years - Not caused by substance or other condition - No history of Tourette or persistent tic disorder
ICD-11 (proposed)	<ul style="list-style-type: none"> - One or more motor and/or vocal tics occurring over the same period of time - Symptoms occur > 12 months 	<ul style="list-style-type: none"> - One or more motor and one or more vocal tics - Symptoms occur > 12 months 	<ul style="list-style-type: none"> - One or more motor or vocal tics, but not both types - Symptoms occur > 2 weeks and <12 months

is hoped that these recommended changes will result in greater recognition and more effective treatment for persons with tic disorders.

Acknowledgements

The Department of Mental Health and Substance Abuse, World Health Organization, has received direct support that contributed to the activities of the Working Group from several sources: the International Union of Psychological Science, the National Institute of Mental Health (USA), the World Psychiatric Association, the Spanish Foundation of Psychiatry and Mental Health (Spain), and the Santander Bank UAM/UNAM endowed Chair for Psychiatry (Spain/Mexico). The authors would like to thank the other members of the Working Group on the Classification of Obsessive-Compulsive and Related Disorders: Murad Atmaca, Naomi Fineberg, Leonardo Fontenelle, Jon Grant, Hisato Matsunaga, Janardhan Reddy, Blair Simpson, Dan Stein, Odile A. van den Heuvel, and David Veale.

Disclosure

DWW and PHT are members of the WHO ICD-11 Working Group on the Classification of Obsessive-Compulsive and Related Disorders, reporting to the International Advisory Group for the Revision of ICD-10 Mental and Behavioural Disorders. Unless specifically stated, the views expressed in this article are those of the authors and do not represent the official policies or positions of the Working Group, of the International Advisory Group, or of the WHO.

DWW receives book royalties from Guilford Press, Springer Press, and Oxford University Press. PHT reports no other conflicts of interest.

References

- World Health Organization (WHO). The ICD-10 classification of mental and behavioural disorders: clinical description and diagnostic guidelines. Geneva: WHO; 1992.
- American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR). Arlington: American Psychiatric Publishing; 2000.
- Goetz CG, Klawans HL. Gilles de la Tourette on Tourette syndrome. *Adv Neurol*. 1982;35:1-16.
- Rickards H, Woolf I, Cavanna AE. "Trousseau's Disease:" a description of the Gilles de la Tourette syndrome 12 years before 1885. *Mov Disord*. 2010;25:2285-9.
- Lajonchere C, Nortz M, Finger S. Gilles de la Tourette and the discovery of Tourette syndrome. Includes a translation of his 1884 article. *Arch Neurol*. 1996;53:567-74.
- Meige H, Feindel E. Tics and their treatment. New York: William Wood and Company; 1907.
- American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). Arlington: American Psychiatric Publishing; 2013.
- Mathews CA, Grados MA. Familiality of Tourette syndrome, obsessive-compulsive disorder, and attention-deficit/hyperactivity disorder: heritability analysis in a large sib-pair sample. *J Am Acad Child Adolesc Psychiatry*. 2011;50:46-54.
- Mahler MS, Rangell L. A psychosomatic study of maladie des tics (Gilles de la Tourette's disease). *Psychiat Quart*. 1943;17:579-603.
- Weissman H, Qureshi IA, Leckman JF, Scahill L, Bloch MH. Systematic review: pharmacological treatment of tic disorders—efficacy of antipsychotic and alpha-2 adrenergic agonist agents. *Neurosci Biobehav Rev*. 2013;37:1162-71.
- Piacentini JC, Woods DW, Scahill L, Wilhelm S, Peterson AL, Chang S, et al. Behavior therapy for children with Tourette disorder: A randomized controlled trial. *JAMA*. 2010;303:1929-37.
- American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. Washington: APA; 1952.
- WHO. Manual of the international statistical classification of diseases, injuries and causes of death. 6th revision (ICD-6). Geneva: WHO; 1948.
- Kurlan R, McDermott MP, Deely C, Como PG, Brower C, Eapen S, et al. Prevalence of tics in schoolchildren and association with placement in special education. *Neurology*. 2001;57:1383-8.
- Spencer T, Biederman J, Harding M, Wilens T, Faraone S. The relationship between tic disorders and Tourette's syndrome revisited. *J Am Acad Child Adolesc Psychiatry*. 1995;34:1133-9.
- Mathews CA, Jang KL, Herrera LD, Lowe TL, Budman CL, Erenberg G, et al. Tic symptom profiles in subjects with Tourette Syndrome from two genetically isolated populations. *Biol Psychiatry*. 2007;61:292-300.
- Alsobrook JP 2nd, Pauls DL. A factor analysis of tic symptoms in Gilles de la Tourette's syndrome. *Am J Psychiatry*. 2002;159:291-6.
- Greene DJ, Black KJ, Schlaggar BL. Neurobiology and functional anatomy of tic disorders. In: Martino D, Leckman JF, editors. *Tourette Syndrome*. Oxford: Oxford University Press; 2013. p. 238-75.
- Conelea CA, Woods DW. The influence of contextual factors on tic expression in Tourette's syndrome: a review. *J Psychosom Res*. 2008;65:487-96.
- Baron-Cohen S, Scahill VL, Izaguirre J, Hornsey H, Robertson MM. The prevalence of Gilles de la Tourette's syndrome in children and adolescents with autism: a large scale study. *Psychol Med*. 1999;29:1151-9.
- Georgiou N, Bradshaw JL, Phillips JG, Bradshaw JA, Chiu E. The Simon effect and attention deficits in Gilles de la Tourette's syndrome and Huntington's disease. *Brain*. 1995;118:1305-18.
- Burd L, Li Q, Kerbeshian J, Klug MG, Freeman RD. Tourette syndrome and comorbid pervasive developmental disorders. *J Child Neurol*. 2009;24:170-5.
- Gillberg C, Gillberg IC, Rasmussen P, Kadesjö B, Söderström H, Råstam M, et al. Co-existing disorders in ADHD – implications for diagnosis and intervention. *Eur Child Adolesc Psychiatry*. 2004;13:180-92.
- Khalifa N, von Knorring AL. Psychopathology in a Swedish population of school children with tic disorders. *J Am Acad Child Adolesc Psychiatry*. 2006;45:1346-53.
- Spencer T, Biederman J, Hardin M, O'Donnell D, Wilens T, Faraone S, et al. Disentangling the overlap between Tourette's disorder and ADHD. *J Child Psychol Psychiatry*. 1998;39:1037-44.
- Scharf JM, Miller LL, Mathews CA, Ben-Shlomo Y. Prevalence of Tourette syndrome and chronic tics in the population-based Avon longitudinal study of parents and children cohort. *J Am Acad Child Adolesc Psychiatry*. 2012;51:192-201.
- Sukhodolsky DG, Landeros-Weisenberger A, Scahill L, Leckman JF, Schultz RT. Neuropsychological functioning in children with Tourette syndrome with and without attention-deficit/hyperactivity disorder. *J Am Acad Child Adolesc Psychiatry*. 2010;49:1155-64.
- Channon S, Sinclair E, Waller D, Healey L, Robertson MM. Social cognition in Tourette's syndrome: intact theory of mind and impaired inhibitory functioning. *J Autism Dev Disord*. 2004;34:669-77.
- Miguel EC, Coffey BJ, Baer L, Savage CR, Rauch SL, Jenike MA. Phenomenology of intentional repetitive behaviors in obsessive compulsive disorder and Tourette's disorder. *J Clin Psychiatry*. 1995;56:246-55.
- Leonard HL, Lenane MC, Swedo SE, Rettew DC, Gershon ES, Rapoport JL. Tics and Tourette's disorder: a 2- to 7- year follow-up of 54 obsessive-compulsive children. *Am J Psychiatry*. 1992;149:1244-51.
- Milad MR, Rauch SL. Obsessive-compulsive disorder: beyond segregated cortico-striatal pathways. *Trends Cogn Sci*. 2012; 16:43-51.

- 32 McKay D, Abramowitz JS, Calamari JE, Kyrios M, Radomsky A, Sookman D, et al. A critical evaluation of obsessive-compulsive disorder subtypes: symptoms versus mechanisms. *Clin Psychol Rev.* 2004;24:283-313.
- 33 Scahill LD, Riddle MA, King RA, Hardin MT, Rasmussen A, Makuch RW, et al. Fluoxetine has no marked effect on tic symptoms in patients with Tourette's syndrome: a double-blind placebo-controlled study. *J Child Adolesc Psychopharmacol.* 1997;7:75-85.
- 34 Weissman MM, Bland RC, Canino GJ, Greenwald S, Hwu HG, Lee CK, et al. The cross national epidemiology of obsessive compulsive disorder. The Cross National Collaborative Group. *J Clin Psychiatry.* 1994;55:5-10.
- 35 Bloch MH, Peterson BS, Scahill LD, Otko J, Katsovich L, Zhang H, et al. Adulthood outcome of tic and obsessive-compulsive symptom severity in children with Tourette syndrome. *Arch Pediatr Adolesc Med.* 2006;160:65-9.
- 36 Bloch MH, Craiglow BG, Landeros-Weisenberger A, Dombrowski PA, Panza KE, Peterson BS, Leckman JF. Predictors of early adult outcomes in pediatric-onset obsessive-compulsive disorder. *Pediatrics.* 2009;124:1085-93.
- 37 Skoog G, Skoog I. A 40-year follow-up of patients with obsessive-compulsive disorder [see comments]. *Arch Gen Psychiatry.* 1999;56:121-7.
- 38 Woods DW, Conelea CA, Himle MB. Behavior therapy for Tourette's disorder: Utilization in a community sample and an emerging area of practice for psychologists. *Prof Psychol Res Pract.* 2010;41:518-25.
- 39 Bloch MH, Panza KE, Landeros-Weisenberger A, Leckman JF. Meta-analysis: treatment of attention-deficit/hyperactivity disorder in children with comorbid tic disorders. *J Am Acad Child Adolesc Psychiatry.* 2009;48:884-93.
- 40 McNaught KS. History and research into Tourette syndrome. In: Walkup JT, Mink J, McNaught KS, editors. *A family's guide to Tourette Syndrome.* Bayside: Tourette Syndrome Association; 2012. p. 222-8.
- 41 Jankovic J, Kurlan R. Tourette syndrome: evolving concepts. *Mov Disord.* 2011;26:1149-56.