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Trichotillomania and its treatment: a review and recommendations

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Abstract

Trichotillomania (TTM) is characterized as an impulse control disorder in which individuals fail to resist urges to pull out their own hair, and is associated with significant functional impairment and psychiatric comorbidity across the developmental spectrum. Onset in childhood or adolescence appears to be the norm, yet the research literature involving pediatric samples is particularly sparse. Efficacious treatments have been developed, in particular cognitive–behavioral interventions involving procedures collectively known as habit reversal training, yet relapse in adults appears to be common. Recent developments in pharmacotherapies for TTM and in combining cognitive–behavioral therapy approaches with medication hold promise, and efforts to examine their relative and combined efficacy are needed. Dissemination of information about TTM and its treatment is a critical next step in the field, since many affected individuals and families cannot find local treatment providers with sufficient knowledge to deliver interventions known to reduce hair pulling behavior.

Keywords

cognitive–behavioral therapy; combined treatments; habit reversal training; impulse disorders; pharmacotherapy; trichotillomania; TTM

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What is trichotillomania?

Trichotillomania (TTM) is a chronic impulse control disorder characterized by pulling out one's own hair, resulting in noticeable hair loss [1]. Although comprehensive, large-scale epidemiological studies have yet to be conducted, TTM is estimated by smaller studies to affect 1–3.5% of late adolescents and young adults [2]; rates among younger children unfortunately remain unknown [3]. Across the developmental spectrum, sufferers can experience medical complications such as skin irritations at the pulling site, infections and repetitive-use hand injuries [4]. The subset of individuals with TTM who ingest the hairs after pulling are at risk of gastrointestinal complications stemming from trichobezoars (i.e., hairballs [5,6]), which have been documented in children as young as 4 years of age [7]. Notably, TTM onset in childhood or adolescence appears to be the norm, and seems to precede that of most comorbidities [8]. Psychiatric comorbidity in adults appears to be very common, with anxiety disorders, mood disorders, substance use disorders, eating disorders [9] and personality disorders being the most common comorbid conditions in adults [10]; while anxiety and disruptive behavior disorders are commonly observed in youths [2,11].

How much does TTM affect functioning?

The effect of TTM on functional outcomes has been a topic of increased study over the past decade, and what has become evident from these investigations is that TTM is far from trivial in terms of its impact. Adults with TTM report impaired school, work and social functioning, lowered career aspirations and missed work days [12–14]. Adults also report spending considerable financial resources on concealment methods and on treatments with varying degrees of success [15]. As TTM usually strikes during the sensitive developmental years, it can be especially disabling [16]; indeed, TTM has been found to be at least moderately impairing in the social and academic realms for older children and adolescents [17]. Many adolescents with TTM encountered in our clinic express great fear that their classmates and friends will discover their bald patches and evaluate them negatively as a result. Unfortunately, it appears that their concerns about peer rejection may be well founded: developmentally normal eighth graders viewing videotaped segments of actors portraying individuals with TTM, chronic tic disorders (CTDs) or neither condition rated the social acceptability of those with TTM and CTDs as significantly lower than those without either condition [18]. Pulling can also negatively impact family functioning, contributing to family arguments and secrecy, which in turn can increase stress and exacerbate TTM symptoms [19,20]. It is unclear whether these family difficulties are causal or largely consequent to the development of TTM; longitudinal research is greatly needed to address this important question.

Implications of developmental factors in TTM psychopathology & treatment

A major priority in TTM psychopathology and treatment research is to recruit younger samples, with the goal of improving our understanding of TTM closer to its time of onset and, by extension, treating TTM effectively earlier. Treating TTM earlier will perhaps reduce future functional impairment and prevent the development of debilitating comorbid disorders. The few studies that have examined TTM and its treatment in younger samples document the presence of TTM in youths ranging from toddlers to adolescents [17,21], and have suggested its responsiveness to behavioral interventions [22]. For example, a case study suggested that pulling symptoms improved following behavior therapy for a 29-month-old child [23]. Nevertheless, despite the fact that TTM appears to be a relatively common pediatric-onset disorder associated with significant morbidity, comorbidity and functional impairment in adults [24], surprisingly few TTM psychopathology research studies have actually included adolescents or children. As yet, there are no published

randomized controlled trials of any psychopharmacological interventions for youths with TTM. Initial findings for cognitive–behavioral therapy (CBT) have been encouraging [25,26], but key questions pertaining to the role of developmental factors in TTM psychopathology and treatment response remain to be addressed. With respect to similarities and differences in TTM phenomenology across the developmental spectrum, very little is known about symptom presentation in young children, but it appears that the scalp is the most common pulling site in both adults and older children and adolescents [3,9,21,27]. Pulling can be both automatic (i.e., outside awareness) and focused (i.e., in response to identifiable affective triggers) within each individual, rather than exclusively one form or the other [28,29], although it appears that there may well be a greater preponderance of automatic pulling in younger samples. The concept of a premonitory urge, which has been discussed extensively in the context of CTDs [30,31], also appears to be important, as most participants in TTM studies to date have reported at least some tension or some other unpleasant sensation that precedes, if not precipitates, pulling [25]. It is possible that young children have not developed the expressiveness skills and emotional awareness required to be able to identify or to report such phenomena, which may necessitate an emphasis within behavioral treatment on the identification of high-risk times for pulling, rather than relying on the patient's ability to recognize and report that the urge to pull is mounting.

Assessment

Assessment of TTM must involve the integration of information from multiple sources to provide a cohesive understanding of the presenting concern in context. Good clinical practice relies on accurate assessment to obtain initial diagnoses, to gather information for treatment planning and to evaluate changes in symptom severity. Such assessments typically include presenting symptoms, diagnostic severity, functional impairment, differential diagnosis, comorbidity and global assessment of functioning. Several TTM-specific instruments developed in the last decade have increased our ability to identify key issues reliably, have furthered our understanding of TTM's psychopathology and have improved our understanding of the implications of certain core aspects of TTM for treatment response. Cognitive–behavioral interventions in particular, which are recommended by experts for TTM and related disorders [32], utilize these assessment data to identify appropriate points of interventions, and can be used to tailor treatment to the particular patient and symptoms.

Developmental factors not only influence the choice of assessment instruments, but also the way in which diagnostic and symptom-specific measures will be conducted. For example, the age of the child will often influence whether parents are invited to participate in the entire evaluation meeting with the clinician; with the suggestion that the younger the child is, the more important it is to have parents in the room for the entire interview. Within that same context, age and other developmental factors (e.g., shyness and previous experience in interacting with adults) may also affect whether questions are directed to the child or to the parent; it is important that, if both are present, the clinician explains that the goal of the meeting is to gather as much information about the pulling as possible and incorporate everyone's perspective, rather than to arrive at 'the truth'. This reminder of the overarching purpose of the assessment may help to reduce conflict when the child and the parent disagree over the details of pulling and its impact on the child. With adolescents, it is usually preferable to interview the adolescent alone, but to invite parents in later to provide a synopsis of the assessment in a way that is respectful of the adolescent's concerns about privacy, but also of the parent's needs to understand the clinical recommendations to follow. Adults are usually interviewed alone, although they do occasionally request that family members (e.g., spouses) be permitted to meet with the clinician as well in order to foster improved understanding of TTM and its effects.

Assessment difficulties are inherent in pediatric TTM, as a combination of factors, including lack of awareness of pulling, embarrassment or shame, developmental factors and parent/child disagreement, may all contribute to inaccuracy of reporting about symptom severity. Discrepancies may also arise in evaluating functional impairment, especially when parents and the child have differing perspectives on how much pulling is affecting the child's social, educational and personal lives. These differences may be more pronounced with adolescents, who may view their parents' assessments as extreme and wish to minimize the impact of TTM in order to save face with the evaluator. In order to minimize arguing, it is important for the clinician to gather information from multiple sources (parent and child self-report, reliable and valid diagnostic and symptom severity scales, self-monitoring and product recording) and to openly acknowledge to all parties that no one individual perspective is the 'correct' one. The evaluator should endeavor to model appropriate ways to discuss TTM within the family in order to help improve the accuracy of the information gathered and to ensure that the child and their parents feel as if their views are being taken into account.

In terms of specific instruments recommended to be included within the initial assessment, we suggest the following:

Trichotillomania Diagnostic Interview

The Trichotillomania Diagnostic Interview (TDI) [16] is a semi-structured interview that provides a 3-point clinician rating of each Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition criteria for TTM. Its format ensures that each criterion is investigated and allows for ratings to indicate threshold, subthreshold and absent symptomatology. The TDI takes approximately 10–15 min to administer, and requires minimal training or practice beside the typical experiences with diagnosis and psychopathology.

National Institute of Mental Health Trichotillomania Questionnaire

Derived from the Yale–Brown Obsessive Compulsive Scale (Y–BOCS) [33,34], this semi-structured clinical interview consists of two clinician-rated scales: the National Institute of Mental Health Trichotillomania Severity Scale (NIMH-TSS) and the National Institute of Mental Health Trichotillomania Impairment Scale (NIMH-TIS) [35]. The NIMH-TSS consists of five questions related to the following aspects of TTM: average time spent pulling, time spent pulling on the previous day, resistance to urges, resulting distress and daily interference. NIMH-TSS scores range from 0 to 25. This section of the NIMH-TSS can also be administered in 10–15 min. The NIMH-TIS is an impairment scale, with scores ranging from 0 to 10. Minimal, mild and moderate/severe impairment ratings are dependent upon extent of distress experienced due to TTM, extent of hair loss and interference in daily activities. Higher scores on both of the TSS scales indicate greater severity/impairment. The NIMH-TSS has been found to be sensitive to changes in symptom severity and impairment following treatment [35–37]. In a randomized controlled trial recently completed by our group at the University of Pennsylvania (PA, USA) [26], inter-rater agreement at baseline was good (0.88). Moreover, test–retest reliability for the NIMH-TSS between intake and baseline (approximately 2 weeks) was also acceptable (0.70).

Photograph measurement

Another potentially useful objective measure of TTM severity and change following treatment is the use of photographs. These photographs are taken of patients' primary pulling sites, providing a concrete assessment of treatment success. It is often best to have the patients' photographs taken of the bald areas at pretreatment and post-treatment to assess for these concrete changes, although it is often the case that regrowth may not be evident

until some months after pulling has ceased. In addition, the patient may use this to monitor maintenance and predict relapse. Such procedures have been used in previous adult and pediatric TTM studies (e.g., [12,38,39]). Photographs may be assessed using a Likert scale to provide for greater precision. In our studies, a 7-point Likert scale ranging from no evidence of alopecia (1) to complete denudement of the area (7) is implemented. Understandably, patients and possibly even parents may be reticent to permit such a photograph to be taken, and it is up to the clinician to exercise their judgment in determining whether the data would be especially helpful in informing treatment.

Patient self-report instruments to document TTM severity

The most commonly used self-report measure for TTM in adults is the Massachusetts General Hospital Hairpulling Symptom Severity Scale (MGH-HS) [40], which consists of seven items, each scored on a 5-point scale, with ratings of 0–4. The total score ranges from 0 to 28, with higher scores indicating greater severity and lower scores indicating decreased severity. The measure assesses urge frequency, intensity, controllability, hair pulling frequency, resistance and associated distress during the prior week. The MGH-HS has demonstrated adequate convergent and divergent validity, strong test–retest reliability, internal consistency and sensitivity to changes in hair pulling symptoms [12,41]. For younger patients, the Trichotillomania Scale for Children (TSC) can be used to gather the patient's self-reported TTM symptoms [42]. Derived largely from the MGH-HS, this instrument has demonstrated acceptable psychometric properties, as well as relatively high parent–child agreement [43].

Milwaukee Inventory of Subtypes of Trichotillomania: adult version & children's version

The Milwaukee Inventory of Subtypes of Trichotillomania (MIST) questionnaires measure the style of pulling on a 9-point Likert scale [28,29]. These instruments are used to help the patient identify their common pattern of pulling, which are separated into automatic or focused pulling. Questions on the MIST questionnaires include information about the patient's level of urge awareness, level of active pulling behaviors and use of implements to pull; its purpose is to help determine the overall level of pulling awareness. Clinically, many have suggested that automatic pulling is probably more amenable to reduction via standard behavioral methods incorporated into habit reversal training protocols [44], whereas focused pulling may require more clinical attention to the affective cues that often drive this form of pulling [14]. As the MIST questionnaires survey this information, it is strongly recommended that clinicians make use of them as a routine part of initial and repeated assessment during treatment.

Premonitory Urge for Tics Scale

The Premonitory Urge Scale or Premonitory Urge for Tics Scale (PUTS) [31] is a 9-item self-report questionnaire designed to assess for the presence of premonitory sensory urges common in persons with CTDs, but can be adapted clinically for use with TTM and related conditions to assess various aspects of urges. Higher scores represent greater levels of premonitory urges. A study of youths with CTDs indicated that the PUTS was internally consistent ($\alpha = 0.81$) and temporally stable at two weeks ($r = 0.86$; $p < 0.01$), although data also suggest that very young children (9 years of age or younger) were unable to respond reliably to questions about the nature of their urges to engage in tics [31]. Since urges also appear to be a common and important phenomenon for individuals with TTM, adapting the PUTS for use in assessing urge presence and intensity is strongly recommended. For example, an item on the PUTS reads: "right before I do a tic, I feel 'wound up' or tense inside." Adapting this measure simply entails interchanging tics for TTM – such as "right before I pull a hair, I feel 'wound up' or tense inside." Psychometrics on the TTM version of this scale are not yet available.

What are the current treatment options?

A wide variety of treatments are attempted clinically to alleviate TTM symptoms in adults, adolescents and children, including cognitive and behavioral therapies, supportive counseling, support groups, hypnosis, medications and combined approaches [14,17]. However, the scientific literature supporting the efficacy of these approaches is not well developed, with fewer than 20 randomized controlled trials available to guide treatment choice and implementation. Most of the available randomized treatment outcome studies have examined behavioral therapies or medications, and their collective findings have been somewhat mixed, especially with respect to the efficacy of medication. Furthermore, only one of these randomized trials was conducted with a pediatric sample [26], despite clear evidence that onset during childhood or adolescence is the norm. A comprehensive review of the entire extant treatment literature is beyond the scope of the current article, but recent reviews (e.g., [14,45]) and a quantitative meta-analysis [46], as well as our own article, have highlighted several key points: first, CBTs are associated with relatively large effect sizes in adults following acute treatment, although relapse appears to be a problem; second, selective serotonin-reuptake inhibitors (SSRIs) generally do not appear to be efficacious in reducing hair pulling symptoms *per se*; third, several compounds that appear to affect other neurotransmitter systems hold some promise for the treatment of TTM; fourth, combined treatments of behavioral therapy plus medication may also prove useful; and fifth, the absence of evidence from randomized controlled trials conducted with pediatric samples hinders treatment development and treatment planning for perhaps the most vulnerable population of TTM sufferers.

Behavioral interventions for TTM (e.g., [44]) have generally included three core elements: first, awareness training, wherein techniques (e.g., self-monitoring) are implemented to improve the patient's awareness of pulling and, better yet, the patient's awareness of the urge that precedes pulling; second, stimulus control, which includes a variety of methods that serve as 'speed bumps' to reduce the likelihood that pulling behavior begins; and third, competing response training, where patients are taught at the earliest sign of pulling, or of the urge to pull, to engage in a behavior that is physically incompatible with pulling for a brief period of time until the urge subsides. These core methods were initially developed and tested by Azrin and Nunn [47], and comprise the main elements of contemporary behavioral treatment, although some habit reversal training protocols have also included other techniques (e.g., relaxation training and cognitive strategies to address dysfunctional thoughts that precipitate pulling).

Expert opinion [32] is convergent with the treatment outcome literature in supporting the use of CBTs that include habit reversal training as the first-line option in TTM. It is also now generally accepted that SSRIs, although potentially useful to address comorbid symptoms of anxiety and depression, are not considered first-line treatments for pulling *per se*. One recent study did support the efficacy of an SSRI in combination with behavioral therapy over behavioral therapy or medication alone [48]; replication of these findings is needed. New developments in pharmacotherapy discussed in the next section open up the possibility of examining the relative and combined efficacy of these novel approaches in concert with behavior therapy too. Whether these treatments should be started simultaneously or delivered sequentially – for example, premedication with an agent of established efficacy followed by behavioral intervention when pulling urges are lowered by medication effects – also needs to be examined using randomized designs.

Behavioral therapy, although efficacious, is not without its limitations, the most pressing of which is the observation that relapse following treatment is common (e.g., [36]). Treatment development work is already underway in several laboratories to examine whether

behavioral therapy involving habit reversal training can be augmented by methods designed specifically to address negative emotions. There is also hope that the research tools developed to more specifically examine pulling styles will aid clinical researchers in providing more targeted behavioral interventions that can be tailored to individual pulling profiles.

Recent developments in pharmacotherapy offer encouragement that therapies that modulate neurotransmitter systems other than serotonin will prove helpful in reducing pulling behavior and pulling urges. Bloch and colleagues' thorough review of the treatment outcome literature highlights the fact that SSRIs offer very little in the way of clinical benefit above and beyond what can be expected from a placebo pill [46]. Clomipramine, a tricyclic antidepressant with serotonergic and other properties, appears to be more efficacious than placebo, but its unfavorable side-effect profile renders it a second-line treatment. Instead, new data have emerged to support, at least preliminarily, the efficacy of an opioid antagonist (naltrexone), a glutamate modulator (*N*-acetylcysteine [NAC]) and an atypical neuroleptic (olanzapine) for TTM. A summary of each is provided in the following section.

Two studies have examined the effects of naltrexone on pulling behavior; the logic of its use is that TTM appears to be appetitive, and some investigators have emphasized the phenomenological and underlying neurobiological overlap with other forms of addictive behavior (e.g., [49]). Accordingly, medications that block opi-oid binding may well prove useful in decreasing the positive reinforcement derived from pulling, hence decreasing urge strength and affecting the behavior. A recent open-label study on 14 children with TTM found that naltrexone reduced hair pulling urges and behavior, and was not associated with any significant side effects [50]. Similarly, a randomized double-blind trial on adults with TTM found some improvement in hair pulling behaviors in adults taking naltrexone [51,52]. This trial, however, was never peer reviewed. To date, there has yet to be a positive peer-reviewed, double-blind study of naltrexone in individuals with TTM that compromises assessment of its potential usefulness in clinical practice. Further study of the efficacy and safety of this intervention is needed, as is more basic research on its mechanism of action.

Formal, if not functional, similarity between the repetitive behaviors seen in tic disorders and those seen in TTM led other neurobiologically oriented investigators to examine the potential utility of atypical neuroleptics to treat hair pulling, either alone or in combination with SSRIs. Initial open trials attested to their use as an augmentative agent [53,54], as well as a monotherapy [55,56]. In the first randomized controlled study of this intervention, monotherapy with the atypical neuroleptic olanzapine was found to be superior to pill placebo in adults [57], although the potentially significant side-effect profile for this class of medications, which includes significant weight gain, metabolic dysfunction and extra-pyramidal symptoms [58,59], continues to render them a second-line option when other treatments are available or have not yet been attempted in a given patient.

Perhaps the most important recent development in pharmacotherapy for TTM involves the use of the glutamate modulator NAC, which was found to be superior to pill placebo in a randomized controlled trial for adults with TTM [60]. Treatment response rates for the NAC condition were not only clearly superior to the control condition, but they also yielded rates that were comparable to those observed in CBT trials with adults. In addition, the side-effect profile was quite favorable, which may well make this compound the most promising recent development in the field. Notably, NAC is not a US FDA-regulated product, so it is readily available in health food stores. However, comparability of products containing NAC between different manufacturers is unknown.

Recommendations regarding existing & new clinical strategies

Research conducted over the past 5 years has focused on TTM's prevalence [61], the functional impact and effectiveness of treatments currently being utilized in clinical practice [17,24], TTM's core psychopathology [28,29], clinical recommendations from the perspective of expert treatment providers [32], the potential utility of combined treatment approaches [48], and the development and empirical evaluation of novel pharmacological approaches that hold promise for clinical care, while simultaneously informing us about TTM's underlying neurobiology. Collectively, this wealth of new information has advanced the field considerably with respect to TTM assessment, has improved our understanding of its phenomenology, and has put us collectively in a better position to evaluate the treatments that are currently available.

One of the prevailing themes that can be gleaned from recent studies is that the style of pulling may be very important clinically, may vary with development and may reflect different affective functions that need to be taken into account when devising new treatment strategies. Automatic pulling, or pulling that takes place outside of awareness and often in the context of sedentary activities, appears to be highly responsive to tactile antecedents (e.g., touching head with fingertips), whereas focused pulling seems to be more responsive to affective or cognitive antecedents. Individuals probably engage in both forms of pulling, but the preponderance of automatic or focused pulling is important to identify as this has treatment implications. Many experts believe that automatic pulling may be more responsive to the behavioral techniques that comprise habit reversal training, most notably awareness training (increasing the patient's awareness of the environmental and tactile antecedents of pulling episodes), stimulus control (making the environment less conducive to pulling) and competing response (engaging in a behavior that is physically incompatible with pulling in response to urges to pull). Focused pulling, on the other hand, may also require techniques that address affective and cognitive antecedents more directly, such as those offered in dialectical behavior therapy (DBT) [62] and acceptance and commitment therapy [63]. Ongoing studies seek to determine the effectiveness of including emotion-regulation elements within TTM treatment for adults [62,64]; within the next 5 years, these trials will inform the field regarding their acute, and perhaps more importantly, long-term efficacy. An open clinical trial of DBT provides preliminary support for the efficacy of DBT-enhanced CBT in treating adults with TTM [62]. A follow-up to this study provided preliminary evidence of the durability of the effects of DBT, with significant improvement from baseline on hair pulling measures and emotion regulation at both 3 and 6 months [65].

In contrast to patterns of pulling in adults, pulling in children and adolescents may well be characterized by a greater preponderance of automatic pulling [17,28,29], which could be one potential explanation for why initial reports on the efficacy and durability of habit reversal training are more promising in younger samples [3,22]. Larger sample sizes will permit clinical scientists to study this more formally by directly comparing the relative outcomes of children and adolescents with a preponderance of automatic pulling, to those with a pulling profile characterized by more focused pulling. Such a study is currently underway [64]: 60 children and adolescents will be randomly assigned to treatment with behavioral therapy involving habit reversal training or to a comparison condition consisting of psychoeducation and supportive counseling. MIST children's version data are being collected in the context of this trial to document the pulling styles of each participant, which will then permit a direct comparison of the preponderance of focused or automatic pulling in order to determine whether pulling style predicts outcome (regardless of treatment assignment) or moderates outcome (affects one treatment condition more than the other).

Expert commentary

As indicated in the discussion of current treatment options, people with TTM should receive CBT, more specifically habit reversal training, which includes the components of awareness training, stimulus control and competing response training. Unfortunately, the lack of evidence from randomized controlled trials in younger populations until very recently leaves those who treat children and adolescents with TTM with an insufficient evidence base to guide clinical decision-making [22]. Our ongoing treatment study focusing on habit reversal training versus a psychoeducation/supportive counseling control condition in youths with TTM will improve our understanding of CBT for pediatric TTM and will provide much-needed information to improve the efficacy and durability of behavioral interventions. With respect to evaluating the usefulness of pharmacotherapy in treating TTM, randomized controlled trials of NAC and other promising therapies, both alone and in combination with behavioral treatments, are needed across the developmental spectrum. It may be the case that combined treatment will allow increased symptom improvement and less severe relapse rates than behavioral treatment alone; however, we cannot be certain of this until the field conducts a greater number of efficacy trials on this topic.

Our expert opinion regarding treatment options must include the caveat that although CBT is the first-rate treatment for TTM, this line of treatment is rarely accessible to TTM sufferers. Many clinicians do not practice CBT, nor do they incorporate habit reversal training into their treatment. Dissemination efforts must increase in order to allow this treatment to become practiced more commonly in community settings. Currently, the gains made in TTM research concerning assessment and treatment effectiveness have not impacted clinical practice beyond the academic context.

Five-year view

The last 5 years have been highly productive with respect to TTM research, and the work that has been carried out recently sets the stage for the next generation of TTM researchers to further advance our knowledge regarding TTM's core psychopathology, TTM's underlying neurobiology, TTM's responsiveness to existing treatment, empirically informed treatment development, and dissemination of the most effective methods into community settings where patients and their families can access them. Instrument development efforts have been critical in laying the foundation for what is to come: we now have psychometrically acceptable measures of TTM severity and pulling styles across the developmental spectrum, which will enable researchers to document symptom severity, symptom change and to examine what may well be a critical predictor, if not moderator, of treatment outcome – namely, the preponderance of automatic versus focused pulling. Much research surrounding TTM in the past has been conducted through open and uncontrolled trials. This methodology does not meet the gold standard of determining treatment efficacy. In fact, open-label studies led to the espousal of certain treatments for TTM, such as SSRIs, which did not ultimately prove themselves to be efficacious after further investigation in double-blind trials. Randomized controlled trials in both adults and children with TTM are needed in order to provide clinicians with the most accurate estimates regarding the likelihood of treatment efficacy. More randomized controlled trials will be needed to replicate the recent findings with behavioral therapy for children and adolescents, for combined treatment in adults, and for NAC, atypical neuroleptics and opioid antagonists across the developmental spectrum. Given that the evidence from treatment studies indicates that treatment response to any of the available therapies is neither universal nor complete, it is also clear that the development of new pharmacotherapies opens up the possibility of studying how these approaches can best be combined with behavioral interventions. It will also be imperative to do in TTM what has begun in earnest in obsessive–compulsive

disorder research [66,67; Franklin ME, Sapyta J, Freeman JB. Cognitive–behavior therapy augmentation of pharmacotherapy in pediatric obsessive compulsive disorder: the pediatric OCD treatment study II (POTS II) randomized, controlled trial. Manuscript submitted], which is to examine how best to improve patient outcomes in those who have completed an adequate course of empirically supported treatment, yet still have residual symptoms. In TTM in particular, it is also important to continue to focus on efforts to improve the durability of treatment gains, given that relapse appears to be common even in those adults who have received adequate treatment and responded well to it initially.

N-acetylcysteine may well prove to be the most influential of the new treatments, given initial findings regarding its efficacy and safety, as well as the interesting questions that can be raised about its mechanisms of action. Studies of its long-term efficacy and safety are also needed, and its effects in younger samples need to be evaluated. As NAC appears to be both efficacious and tolerable, it stands out among the various medication candidates for direct comparison with CBT and with combined treatment in future trials.

The progress made in the past 5 years in TTM has yet to have a major impact on clinical practice for TTM outside the academic context, and this remains as the next, if not the largest, challenge still facing the field. Investigators have noted that empirically supported CBTs for a wide variety of disorders are often not available in community settings and, when accessed in such settings, are often delivered suboptimally (e.g., [68]). We concur that this issue is a general problem that faces the field more broadly, but our experience clinically and in conducting treatment trials for TTM suggests that it may be even more pronounced for this condition. Families have contacted our clinic to participate in our TTM research trials from outside of our region and even nation, and report doing so because they have exhausted local efforts to find a treatment provider that has even minimal expertise with TTM [17,24]. Efforts to improve awareness of TTM must be accelerated in order to assist providers in developing more basic awareness, knowledge and competence in TTM and its treatment. We are pleased to see that patient-oriented organizations devoted to dissemination of information about anxiety disorders (e.g., Anxiety Disorders Association of America) and obsessive–compulsive disorder (e.g., Obsessive–Compulsive Foundation) have been working with the leading patient-oriented organization in TTM (Trichotillomania Learning Center) in attempts to include more presentations about TTM to their respective members in the last 5 years. Efforts such as these will be vital in getting mental health practitioners more directly involved in the process of providing treatments for TTM. In the next 5 years, it will be critical for clinically oriented TTM researchers to meet this burgeoning demand for information and training by developing optimized models for doing so, as these efforts may well be the best way to address the major shortage of therapist expertise in TTM that is unfortunately evident in most regions of the USA, as well as globally.

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Key issues

- Assessment tools have been developed over the past 5 years that have permitted more accurate evaluation of pulling styles across the developmental spectrum and of trichotillomania (TTM) severity in children and adolescents.
- Recent reviews have highlighted the efficacy of cognitive–behavioral therapy for TTM in adults, but have also noted problems with relapse; these same reviews have noted the general lack of benefit associated with treatment with selective serotonin-reuptake inhibitors alone.
- Recent developments in pharmacotherapy have suggested that other medications – atypical neuroleptics, opioid blockers and glutamate modulators – hold promise as treatments for TTM.
- More research is needed to develop a better understanding of TTM phenomenology across the developmental spectrum, the psychological and biological mechanisms underlying the disorder, and how best to make use of the treatments already developed that have shown efficacy for TTM.
- Demonstration of treatment efficacy must now be followed by dissemination of this information to mental health providers in order to address the paucity of therapists available to provide these treatments for families and individuals who need them.

Learning objectives

Upon completion of this activity, participants should be able to:

- Describe the clinical characteristics of TTM, based on a review
- Describe diagnostic assessment of TTM, based on that review
- Describe management of TTM, based on that review