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Evidence Base Update for Psychosocial Treatments for Pediatric Obsessive-Compulsive Disorder

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Abstract

Objective—Pediatric Obsessive Compulsive Disorder (OCD) is a chronic and impairing condition that often persists into adulthood. Barrett and colleagues (2008), in this journal, provided a detailed review of evidence based psychosocial treatments for youth with OCD. The current review provides an evidence base update of the pediatric OCD psychosocial treatment literature with particular attention to advances in the field as well as to the methodological challenges inherent in evaluating such findings.

Method—Psychosocial treatment studies conducted since the last review are described and evaluated according to methodological rigor and evidence-based classification using the JCCAP evidence based treatment (EBT) evaluation criteria (Southam-Gerow and Prinstein, this issue).

Results—Findings from this review clearly converge in support of CBT as an effective and appropriate first line treatment for youth with OCD (either alone or in combination with medication). Although no treatment for pediatric OCD has yet to be designated as "well established", both individual and individual family based treatments have been shown to be "probably efficacious."

Conclusions—Moderators and predictors of treatment outcome are discussed as are the areas where we have advanced the field and the areas where we have room to grow. The methodological and clinical challenges inherent in a review of the evidence base are reviewed. Finally, future research directions are outlined.

Keywords

Obsessive Compulsive Disorder (OCD); Cognitive Behavioral Treatment (CBT); Evidence based treatment (EBT)

Obsessive-compulsive disorder (OCD) is a chronic and impairing psychiatric condition that affects up to 2–3% of children and adolescents (Flament, Whitaker, Rapoport, & Davies, 1988; Valleni-Basile, Garrison, Jackson, & Waller, 1994) and is associated with impaired functioning at home, school, and with peers (Piacentini, Bergman, Keller, & McCracken, 2003). OCD often persists into adulthood (Flament et al., 1990; Rasmussen & Eisen, 1990), is a significant risk factor for later negative sequelae, including anxiety and depression (Wewetzer et al., 2001), and is considered the 11th greatest national cause of disability (National Institute of Mental Health, 1999, 2000). In response to the public health impact of OCD, efforts have been made to examine the efficacy of treatment approaches and to create

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expert consensus guidelines to direct practitioners in the treatment of this disorder (e.g. National Institute of Clinical Excellence, 2005; O'Kearney, Anstey, von Sanden, & Hunt, 2010; American Academy of Child and Adolescent Psychiatry, 2012).

One such effort includes a review of the research literature conducted on psychosocial treatments for child and adolescent OCD from 1994 through 2007 (Barrett, Farrell, Pina, Peris, & Piacentini, 2008). In this review, 16 identified studies were classified based on methodological rigor according to criteria established by Nathan and Gorman (2002). Additionally, using the criteria of Chambless, Baker, Baucom, Beutler and Calhoun (1998), Chambless and Hollon (1998) and Chambless et al. (1996), the identified treatments were categorized as well established, probably efficacious, possibly efficacious, or *experimental*. Based on these criteria, individual exposure-based, cognitive-behavioral therapy (CBT) was considered *probably efficacious* whereas non-family-focused group CBT and family-focused individual CBT were considered *possibly efficacious*. Barrett et al. (2008) offered numerous recommendations to guide future research, including the importance of replicating studies, examining the relative efficacy of various modalities (e.g., group vs. individual vs. family), developing strategies to address treatment non-responders, identifying the predictors, moderators, and mediators of treatment, and examining the dissemination and implementation of evidence-based treatments in community settings.

Given the advancement of research in these areas since the Barrett et al. (2008) review, the current update is warranted. Similar in format to the previous review, psychosocial treatment studies conducted to date are described and evaluated according to methodological rigor and evidence-based classification using the five-level JCCAP evidence based treatment (EBT) evaluation criteria (Southam-Gerow and Prinstein, this issue). The recommendations made by Barrett et al. (2008) are discussed with a particular focus on where the field has grown and the areas where growth is still needed. Lastly, recommendations for best practice and future research are offered.

Summary of Evidence-Based Psychosocial Intervention Studies for Pediatric OCD

In order to provide an update of Barrett and colleagues' (2008) review, a comprehensive search of the psychosocial treatment literature for child and adolescent OCD was conducted. Studies published between 2007 and 2012 were the focus of this review. Studies that were used in Barrett and colleagues' (2008) initial summary of this research are referenced as appropriate, but are not re-reviewed or included in Table 1. Of note, because this was a review of the evidence base for psychosocial treatments, the evidence base for pharmacological interventions for pediatric OCD is not reviewed. For further review of pharmacological interventions in pediatric OCD, see American Academy of Child and Adolescent Psychiatry (AACAP) practice parameters (2012). The authors fully acknowledge that CBT is considered a first line treatment for mild to moderate OCD and that combined (CBT and medication) treatment is the intervention of choice in youth with moderate to severe OCD (American Academy of Child and Adolescent Psychiatry, 2012). Medication alone is also sometimes warranted, but tends to produce less robust gains (Geller et al., 2001). As in the previous review, all of the pediatric psychosocial treatments that met the inclusion criteria for this review utilize some form of CBT. Some studies used full CBT packages while others used variants (e.g., expressly cognitive focus; exposure only), changed the frequency of treatment delivery (e.g., brief treatment; intensive treatment), or altered the number of participants (e.g., family based treatment; group treatment), among other variations. Only four controlled youth OCD psychosocial trials were conducted prior to 2007, and findings from nine such trials have subsequently been published. Although this speaks to the growth of pediatric OCD treatment research over the last five years, many of

these controlled trials are testing novel variants of CBT or are lacking in other aspects of methodological rigor, which leads to more tentative conclusions when evaluating their evidence base.

Southam-Gerow and Prinstein's (this issue) evidence-base level criteria (based on criteria introduced by Chambless et al., (1998) and elaborated on by Lonigan, Elbert & Johnson (1998) and Silverman and Hinshaw (2008)) include *well-established* (level 1), *probably efficacious* (level 2), *possibly efficacious* (level 3), *experimental* (level 4) treatments and *treatments of questionable efficacy* (level 5), as outlined in Table 2. In addition to requiring explicitly delineated levels of empirical support, a number of methodological criteria are included in these guidelines. The most rigorous treatment studies must be randomized controlled trials (RCT), use treatment manuals, clearly define inclusion criteria, administer reliable and valid assessment measures and employ appropriate data analytic techniques. Level 1 and level 2 treatment studies must satisfy all five of these criteria. Level 3 and level 4 treatment studies do not need to be RCTs, although they do need to fulfill the other four methods criteria. In order to be classified as a level 3 treatment, there needs to be at least one additional peer-reviewed study demonstrating the treatment to be efficacious. There are no other stipulations for classification as a Level 4 treatment. Many level 3 and level 4 studies are open trials and pilot studies with small sample sizes, but are important to include in the absence of larger controlled treatment trials. Treatments classified as Level 5 treatments are those tested with a good group-design, but shown to be inferior to other treatment groups or to a wait-list control group. The designation of evidence-base levels for each treatment format was discussed between the first and third authors. These decisions were further discussed among the remaining authors to refine and finalize the classifications. There was no formal record or reliability check for this process, although the decisions were discussed at length until the group came to a consensus.

Studies considered for review were identified through searches of PsycINFO and PubMed (keywords: *OCD* or *obsessive*, *exposure* or *behavior therapy* or *cognitive-behavior therapy*, and *child* or *adolescent* or *pediatric*). In addition, review articles and identified treatment studies were examined. Using the above criteria, our search yielded 49 peer-reviewed articles for consideration. The first and third authors examined these articles and determined that 18 of them were appropriate within the context of this review. Using the same criteria as Barrett et al. (2008), all included studies were written in English, involved more than one participant, and included children and adolescents between the ages of 5 and 17. Some studies (n=2) included a psychopharmacological component, but also had to include a psychosocial component (i.e. CBT) in order to be retained for review.

In order to most effectively summarize the studies conducted since Barrett and colleagues' (2008) initial review, each article was categorized according to treatment format. With regard to type, all studies used some form of CBT. The specific emphasis of the CBT (i.e., exposure versus cognitive strategies) is noted when describing the studies below. The format was divided based on the criteria used by Barrett et al. (2008) and included individual CBT (Bjorgvinsson et al., 2008; Bolton & Perrin, 2008; Bolton et al., 2011; Franklin et al., 2011; Storch, Murphy et al., 2010; Whiteside & Jacobsen, 2010; Williams et al., 2010) family-focused individual CBT (Freeman et al., 2008; Ginsburg, Burstein, Becker, & Drake, 2011; Merlo et al., 2010; Piacentini et al., 2011; Storch, Lehmkuhl et al., 2010), non-family focused group CBT (Olino et al., 2011; Sochting & Third, 2009), and family-focused group CBT (Farrell, Waters, Milliner, & Ollendick, in press; Farrell, Schlup, & Boschen, 2010). Family-focused CBT treatments had to consistently rely on parent (and sometimes sibling) involvement throughout treatment, rather than just including psychoeducation or a limited number of parent sessions. This criterion is consistent with the definition used by Barrett et al. (2008), with a distinction made between some necessary degree of parental involvement

in child and adolescent treatment and a systematic need for parents to participate in treatment (e.g. Barrett, Dadds, & Rapee, 1996; Cobham, Dadds, & Spence, 1998). A new treatment format, Technology-Based (or Non-face-to-face) CBT (Storch et al., 2011; Turner, Heyman, Futh, & Lovell, 2009), was also included in this review. This novel format uses recent technology-orientated interventions via web-camera or telephone, which are unique both in their delivery and in their role in treatment dissemination. Each of the studies selected for inclusion are summarized in the following sections, providing a comprehensive overview of the extant OCD psychosocial treatment literature.

Following the division of individual articles into treatment formats, each of these formats was assigned an evidence base level according to Southam-Gerow and Prinstein's (this issue) criteria described above. No treatments were classified as *well-established* or as *treatments of questionable efficacy*. Two treatments were classified as *probably efficacious* (Individual CBT and Family-focused individual CBT). Two were classified as *possibly efficacious* (Non-family focused group CBT and Family-focused group CBT) and one was classified as an *experimental treatment* (Non-face-to-face or technology–based CBT). Given the addition of new studies to the literature, the evidence level for some treatments has shifted since Barrett et al.'s (2008) initial review. These shifts in evidence level are discussed in more detail in the section following the literature review below.

Review of the Psychosocial Treatment Literature in Pediatric OCD

Theoretical Foundation for Cognitive Behavioral Treatment

Each of the specific treatments reviewed below include some variant of CBT as the core of the intervention. Early behavioral theories on the development and maintenance of OCD symptoms grew from Mowrer's two-factor theory, and suggested that a conditioned stimulus came to elicit a conditioned fear response through pairing with an aversive unconditioned stimulus (Mowrer, 1960). OCD symptoms are theorized to be maintained when the conditioned fear response evokes avoidance/rituals, which are negatively reinforced by anxiety reduction. Although development of anxiety may occur for reasons other than this conditioning process (Menzies & Clarke, 1995), maintenance of OCD symptoms through negative reinforcement forms the foundation for the treatment rationale. Exposure with Response Prevention (EX/RP), the primary component of treatment for OCD that builds upon this theory, emphasizes exposure to feared thoughts/situations while children refrain from engaging in compulsions and/or avoidance.

Cognitive-behavioral theories have additionally emphasized the role of distorted cognitions in the development and maintenance of OCD. Specifically, errors in the interpretation of cognitive intrusions, such as thought-action fusion, doubting, overestimating harm probability, and inflated responsibility have been implicated and are frequent targets of cognitive restructuring during treatment (Cartwright-Hatton, Reynolds, & Wilson, 2011; Salkovskis, 1985). In addition to mechanisms purported by behavioral theory (i.e. habituation and extinction), cognitive-behavioral theory suggests that changes in faulty cognitions are an active mechanism of change during CBT for OCD. In particular, this theory proposes that habituation occurring during EX/RP promotes the emotional processing of fear and provides patients with information that disconfirms obsessional content.

Building upon these theories, the large majority of studies focusing on psychosocial treatment of pediatric OCD have tested Cognitive-Behavioral Therapy (CBT) treatment packages. CBT for pediatric OCD contains several elements, such as psychoeducation, hierarchy building, EX/RP, cognitive strategies, reward programs, family/parent training, and relapse prevention (March & Mulle, 1998; Piacentini, Langley, & Roblek, 2007). Despite a strong overarching theoretical rationale to support the inclusion of these elements

in CBT treatment packages, there is limited evidence regarding the "active" ingredients. Studies with adults suggest that an optimal increase in anxiety (i.e. during EX/RP) must occur to produce therapeutic effect (Foa & Kozak, 1986; Kozak, Foa, & Steketee, 1988), and meta-analysis suggests that treatment packages including EX/RP produce the largest effect sizes (Abramowitz, Whiteside, & Deacon, 2005). This line of evidence suggests that EX/RP is a critical component of CBT treatment packages, but does not clarify the mechanism(s) of change that is activated through use of EX/RP procedures.

Review of Individual Treatment Studies

Seven studies examining individual CBT have been published since the Barrett et al. (2008) review (See Table 1). Although the studies reviewed below all share an individual (child primarily seen alone) CBT model, many employ different variants of CBT (i.e., exposure only, emphasis on cognitive components, intensive treatment). However, there are not yet enough studies of these "variants" to make clear decisions among them as to their incremental or differential benefit.

The POTS II trial (Franklin et al., 2011) examined the efficacy of augmenting pharmacotherapy with CBT or instructions in CBT to treat youth with primary OCD. Results point to the efficacy of medication management augmented with CBT, but the novel adaptation of a condensed version of CBT without in session in vivo exposure failed to separate from continuation of medication management alone (MM only). Unlike the prior POTS Study (Pediatric OCD Treatment Study Team, 2004), site effects were not found. Youth in the MM only condition were more likely to prematurely terminate and to receive outside treatment. Post hoc analyses, which accounted for youth who received out-of-protocol treatment after premature termination, yielded similar results to the intent to treat analyses.

Two studies have examined the efficacy of individual CBT packages that emphasized cognitive strategies (Bolton et al., 2011; Williams et al., 2010). Both approaches emphasized the identification of maladaptive cognitions (e.g., responsibility attribution) and the introduction of cognitive coping strategies. Behavioral experiments were enlisted to challenge maladaptive cognitions. Although ERP could occur within the context of these behavioral experiments, there was no formal development of a fear hierarchy and the emphasis of behavioral experiments was on addressing the cognitions, not habituating to the anxiety. Results indicated efficacy of the active treatment conditions as compared to the waitlist, but in the Bolton et al. (2011) study, which compared two different versions of the treatment package, no difference in outcome was detected between the versions of the treatment.

In contrast to the emphasis on cognitive strategies in the studies reviewed above, Bolton and Perrin (2008) examined the efficacy of an intensive ERP treatment alone for children and adolescents with OCD as compared to a waitlist control. In addition to the fact that this treatment did not include any cognitive training component, it was also delivered in somewhat more intensive format than traditional weekly treatment. Due to the goal of examining the efficacy of ERP alone, therapists did not incorporate the following components into treatment: psychoeducation on neurobiology or cognitive models of OCD, cognitive strategies for addressing OCD, narrative approaches, family interventions, or relaxation. The treatment condition demonstrated significant improvements over time (42% change from baseline to posttreatment). However, assessors were not blind to condition.

In a novel approach to augment individual CBT, Storch, Murphy et al. (2010) examined the effectiveness of a combination of individual CBT and D-cycloserine (DCS) to treat pediatric OCD based on animal research showing that DCS, an N-methyl-D-aspartate agonist,

enhances extinction of learned fear responses (Davis, Ressler, Rothbaum, & Richardson, 2006; Norberg, Krystal, & Tolin, 2008). Youth were randomized to receive CBT + DCS or CBT + Placebo. DCS/placebo was not given prior to out-of-session exposure tasks to avoid potential desensitization to the effects of DCS. Results generally found improvements in both conditions, but the two treatment conditions did not differ significantly from one another. No adverse effects were reported by youth who received DCS. Physical examination lab results were all normal following treatment with DCS.

Finally, two open trials have been conducted with intensive individual CBT. Björgvinsson et al. (2008) conducted an open trial examining intensive inpatient treatment for adolescents with a primary diagnosis of OCD. The majority of the participants had previously failed to respond to outpatient treatment. Youth stayed at the unit for an average of 9.5 weeks (ranging from 4 to 21 weeks). Patients participated in psychoeducational interventions as well as CBT groups and individualized family interventions. In addition to psychosocial interventions, youth could also receive medication management. Results indicated significant decreases from baseline to posttreatment in obsessions, compulsions, thought action fusion, state and trait anxiety, responsibility and threat estimation, perfectionism and certainty, and importance/control of thoughts. Seventy percent of patients exhibited clinically significant decreases in their CY-BOCS scores using Jacobson and Truax's (1991) Reliable Change Index.

Similar improvements in OCD symptoms were found in an open trial examining a 5-day intensive treatment program for youth with a primary diagnosis of OCD (Whiteside & Jacobsen, 2010). Treatment, which was based on commonly used adult and child protocols (Kozak & Foa, 1997; March & Mulle, 1998), consisted of ten 50-minute traditional CBT sessions over five days (one each morning and one each afternoon). Results indicated significant decreases in CY-BOCS total scores from baseline to posttreatment as well as from posttreatment to 5-month follow-up. Although this study demonstrated less of a decrease in CY-BOCS scores as compared to other trials examining 3-week intensive programs (Franklin et al., 1998; Storch et al., 2007), it demonstrated comparable reductions at follow-up.

The addition of seven individual treatment studies since Barrett and colleagues' (2008) initial review demonstrates substantial growth in this subset of treatment research. As stated above, however, the fact that these studies employed diverse variants of individual CBT (i.e., exposure only, emphasis on cognitive components, intensive treatment, etc…) makes it challenging to compare across studies. Additionally, only three of the seven studies compared the active treatment to a psychological placebo or to another active treatment.

Family-focused Individual CBT—At the time of the review by Barrett et al (2008), the literature on family-focused individual CBT was notably small (Barrett, Healy-Farrell, & March, 2004; Storch et al., 2006; Waters, Barrett, & March, 2001). Since the original review, six studies have examined individual CBT with a focus on family involvement. It should be noted that the distinction of family-focused here is meant to imply a format for treatment delivery (i.e., inclusion of family) rather than a proposed mechanism. None of the studies reviewed below compared family-focused CBT to individual CBT and therefore were not clearly testing family focus as the source of change. Freeman and colleagues (2008) evaluated the efficacy of family-focused individual CBT for young children with primary OCD. Children ages 5 to 8 years were randomized to 12 sessions of either family-focused CBT or family-focused Relaxation Therapy (RT). Drawing on the March and Mulle (1998) manual for older children, the CBT protocol was adapted to fit the cognitive developmental level of young children and included greater emphasis on parent-based strategies to support ERP implementation. Intent to treat analyses indicated a significant

difference in rates of remission on the CY-BOCS in favor of CBT. The mean change in CY-BOCS total score did not differ across groups in intent to treat sample, but a significant difference favoring CBT was demonstrated among completers.

Piacentini et al. (2011) randomized participants to one of two conditions: family-focused CBT or psychoeducation and relaxation training. Intent to treat analyses indicated higher response rates on the Clinical Global Impression (CGI) scale in the CBT group as compared to the psychoeducation/relaxation training group. Those in the CBT condition had a faster rate of decline of OCD symptoms (CY-BOCS scores) and OCD-related impairment, but group differences in both variables at posttreatment were not detected.

Storch, Lehmkuhl et al. (2010) completed an open trial with youth who were partial responders or nonresponders to two or more trials of SRIs and/or SRIs augmented with an atypical antipsychotic medication. Treatment involved 14 90-minute family sessions delivered in an “intensive” manner such that all 14 sessions occurred in a 3-week span. Results indicated a 54% reduction in symptom severity at both posttreatment and 3-month follow-up.

Merlo and colleagues (2010) randomized youth to family-focused CBT plus motivational interviewing or family-focused CBT plus psychoeductation. As in Storch, Lehmkhul et al. (2010), treatment was delivered in an intensive manner, with 14 sessions over 3 weeks. By session 5, CY-BOCS scores for those in the CBT plus motivational interviewing condition were significantly lower than those in the other condition. At session 9, this difference remained, but by posttreatment, CY-BOCS scores between conditions were not different. Additionally, at posttreatment, there were no differences between conditions on the CGI-I.

Ginsburg and colleagues (2011) examined family-focused CBT in children ages 3 to 8 years, using a multiple baseline design in which children were randomized to baseline lengths of 1, 2, or 3 weeks. Assessments were conducted by a trained independent evaluator using standardized measurements. Results indicated a significant reduction in OCD symptoms and OCD-related impairment at posttreatment, and results were maintained at 1-month follow-up. Finally, reductions in family accommodation throughout treatment were reported.

During the period since the last review, O'Leary, Barrett, and Fjermestad (2009) conducted a long-term follow up (7-years) of a study that originally found individual family-focused treatment to be efficacious relative to waitlist and equivalent to a family focused group treatment (Barrett et al., 2004). Forty-nine percent of the original sample participated in the long-term follow up and results suggest that these gains were maintained in the two treatment groups.

As with individual CBT, the number of new studies of family focused CBT since Barrett et al.'s original review demonstrates a notable advancement in this area of OCD treatment research. As will be described in some more detail below (see Evidence Based Status of Treatments for OCD and Evaluative Conclusions), these studies of family focused CBT have some significant limitations including mixed findings on primary outcome measures and/or the use of methodologically weaker control groups.

Review of Group Delivered CBT

Four studies of group delivered CBT were reviewed by Barrett et al. (2008). Although there was preliminary support for this format of CBT, all of these studies were open trials and included other methodological limitations related to small sample size, limited assessment, and lack of control groups (Asbahr et al, 2005; Himle, Fischer, Van Etten, Janeck, & Hanna, 2003; Martin & Thienemann, 2005; Thienemann, Martin, Cregger, Thompson, & Dyer-

Friedman, 2001). In particular, there were no controlled evaluations comparing group to another active OCD treatment.

Two more recent studies have examined non-family focused group CBT for pediatric OCD, but they have similar limitations with regard to lack of control groups and small sample size. Sochting & Third (2009) treated 7 adolescents using 10 2-hour sessions of group CBT. Outcome was assessed by the same individual who facilitated the group. Results indicated a significant decrease in symptoms from pretreatment to 12-month follow-up, but a significant difference was not detected between pre- and post-treatment.

Olino and colleagues (2011) treated 41 children and adolescents, ages 6 to 17 years, in an open trial involving intensive outpatient program. Sessions occurred up to 4 times per week, with the average length of treatment being 12 weeks. Results indicated a significant decrease in OCD symptoms from pre- to post-treatment. Depression scores also showed significant reductions from pre- to post-treatment. Although they did not statistically compare the trials, the authors suggest that the magnitude of symptoms reduction in this trial is similar to that seen in POTS I, which they take to mean one can achieve similar acute effects with Individual– and Group-administered ERP.

Although these two more recent studies on non-family focused group CBT are encouraging, because of the lack of control groups and small sample sizes, few conclusions can be drawn at this time.

Family-focused Group CBT—In Barrett et al. (2008), there was a single study of family-focused group CBT (Barrett et al., 2004). The group treatment led to significant reduction in OCD symptoms and was statistically equivalent to individual treatment and statistically different than the waitlist condition. Since the original review, there have been two additional studies of family-focused group CBT. Farrell, Waters, Milliner, and Ollendick (in press) conducted an open trial of group CBT in youth with complex comorbidity. Treatment involved two manualized versions of individual CBT (one for adolescents and one for younger children). Thirteen weekly sessions and 2 booster sessions (1 and 3 months posttreatment) were provided. In addition to individual sessions, the treatment protocol included 3 parent group sessions and 2 individual family sessions designed to address family accommodation and to assist with exposure. Significant reductions on the CY-BOCS pre- to posttreatment were reported (mean reduction of 45%), and gains were maintained at 6-month follow-up. Comorbidity status and functional impairment were unrelated to acute treatment outcome, however, multiple comorbid diagnoses and a diagnosis of ADHD at pretreatment both were associated with nonresponder status at follow-up.

Farrell and colleagues (2010) examined family-focused CBT in a community-based outpatient clinic. Treatment was delivered primarily in a group format (although some cases (n=6) were treated individually), depending on whether a group was available at the time of intake. Assessments were conducted by trained master's level clinicians who were blind to treatment condition at pretreatment only (they were not blind at posttreatment evaluation). Seven children participated in individual therapy and 26 participated in group. Treatment was based on a standardized manual that had been used in a previous trial. Results indicated significant pre to posttreatment changes in all outcome variables. Authors reported a mean reduction in symptom severity of 61%. Benchmarking analyses indicated that effect size within group (CY-BOCS change scores) was similar to one previous RCT (Pediatric OCD Treatment Study Team, 2004) but less robust than Barrett et al. (2004).

Both of these family-focused group treatments show promising results but the small number of studies and lack of control groups limit the conclusions that can be drawn at this point. Notably, however, each of these studies tackled important effectiveness elements including treatment of complex comorbidity and provision of treatment in a community clinic by master's level clinicians—elements which will be discussed below with regard to future directions.

Review of Technology-Based CBT (non face-to-face CBT)

Since the original review, treatments incorporating the use of technology, which allows greater access to care, have been developed and preliminarily examined. Specifically, two studies examining non face-to-face (using technology such as phone or webcamera) formats of CBT were identified. Given the novelty of these formats, information pertaining to these investigations is provided in greater detail than the previously reviewed studies.

Turner and colleagues (2009) conducted an open pilot study to examine the effectiveness of CBT delivered via telephone (TCBT) for youth with primary OCD. They treated ten predominantly male youth aged 13 to 17. All youth lived too far away from the clinic to regularly attend in-person sessions. Treatment involved weekly CBT sessions conducted via telephone. Treatment followed a CBT manual originally developed for traditional face-to-face therapy and youth received an accompanying workbook in which to record their homework assignments. No other details describing the treatment were included. Family involvement occurred via telephone conference format or sequential telephone calls. Specifics regarding treatment length, treatment content, and family involvement were not described.

Results provide preliminary support for the efficacy and acceptability of TCBT. At posttreatment, 70% of participants had CY-BOCS scores at or below 10 and this decline was maintained across the two follow-up assessments. Open-ended feedback from participants and their families indicated acceptability of the treatment. Specifically, participants found the treatment to be convenient, flexible, and less stressful than attending a clinic. They reported that participation in telephone-delivered CBT allowed them to receive treatment they would not have otherwise been able to receive.

Storch et al. (2011) investigated the efficacy of family-focused CBT delivered via web-camera (W-CBT) compared to a waitlist control. Thirty-one youth ages 7 to 16 were randomly assigned to one of these conditions. A majority of the participants (74%) lived over 90 miles away from the treatment providers. Many patients lived out of state, and two lived out of the country. Youth were required to have a primary diagnosis of OCD, to have access to a computer, and to be stable on medications for at least 8 weeks prior to the treatment entry (if applicable). A majority of the youth had comorbid diagnoses. Youth were excluded if they had a psychotic disorder, bipolar disorder, conduct disorder, or an autism spectrum disorder. Participants were required to attend an initial in-person evaluation and rapport-building session with their therapist. They were then assigned to the treatment condition or to a 4-week waitlist condition. Treatment was based on the POTS (2004) protocol and was delivered by trained doctoral students. Treatment consisted of fourteen 60–90 minute web sessions of family-focused CBT over 12 weeks. Treatment handouts were e-mailed to participants. Out-of-session exposure tasks were assigned for homework each week, the results of which were read aloud or e-mailed to the therapist. At least one parent attended all sessions. Parents received instruction on how to respond to their child's OCD symptoms and how to coach their child through exposure tasks that were conducted outside of the therapist's view.

Results provide preliminary support for W-CBT. Analysis of CY-BOCS scores evidenced a 56.1% reduction from baseline to posttreatment for W-CBT compared to a 12.9% reduction for those on the waitlist. Similar improvements were found based on the CGI-S. With regard responder status, 81% of those in the treatment condition were responders according to the CGI-I compared to only 13% of those in the waitlist condition. Remissions were also significantly higher for those who received W-CBT versus those on the waitlist (56% vs. 13%). With regard to maintenance of gains, a slight but significant increase in CY-BOCS scores was found for treatment completers from posttreatment to 3-month follow-up. However, follow-up scores remained significantly lower than baseline scores. No significant difference was found between posttreatment and follow-up CGI-S scores. At 3-month follow-up, slightly fewer participants were considered treatment responders (71%) but remission rates maintained (57% at follow-up vs. 56% at posttreatment).

The inclusion of these studies of technology-based CBT in this evidence base update demonstrates an important future direction for the field. Though the results are encouraging, they are at this point limited by small sample sizes and the lack of active control groups.

Evidence-Based Status of Treatments for OCD

The results of this review suggest that there have been significant advancements in the evidence-base for several psychosocial treatments for pediatric OCD, but there is still much work to be done (See Table 3). Despite the large number of published studies, there is still no treatment for pediatric OCD that has been deemed "*well-established*" as specified by the criteria outlined by Southam-Gerow and Prinstein (this issue). As described earlier, the designation of "*well-established*" requires that a treatment demonstrate superiority to psychological placebo or another active treatment in at least two independent, methodologically rigorous randomized controlled trials.

Individual CBT was previously designated as a *probably efficacious* treatment (Barrett et al., 2008) based on findings from the POTS Team (2004) study suggesting equivalent benefit to the established selective serotonin reuptake inhibitor (SSRI), sertraline, and superiority to pill placebo. This study, however, was critiqued for a site effect in which CBT outperformed sertraline at one site but not another. During the period covered by the present review, the randomized controlled trial by Franklin et al. (2011) also tested the efficacy of individual CBT and demonstrated that the addition of CBT to medication management resulted in significantly greater response rates than medication management alone. These results build upon those of the POTS Team (2004) and there was no site effect in this study as opposed to the one found in the original POTS (2004) trial. However, this study is not a pure test of CBT alone in that CBT was used as an augmentation treatment for SSRI partial responders. Although both the POTS Team (2004) and Franklin et al. (2011) studies meet Level 1 methods criteria, both studies were conducted by the same research groups. Therefore, individual CBT remains *a probably efficacious* treatment.

Previously considered a *possibly efficacious* treatment (Barrett et al., 2008), family-focused individual CBT now meets the criteria for a *probably efficacious* treatment as specified by Southam-Gerow and Prinstein (this issue). Family-focused individual CBT meets these requirements based on the findings from Barrett et al. (2004) (included in Barrett et al., 2008) as well as additional papers by Freeman et al. (2008) and Piacentini et al. (2011).

In the study by Barrett et al. (2004), individual family-focused CBT was equivalent to group delivered family-focused CBT and both of these treatments were better than waitlist. Freeman et al. (2008), in a preliminary pilot study of family-focused CBT for young children with OCD (ages 5–8), compared their treatment against an active, family-focused relaxation treatment. Results were significant for the ITT sample with regard to overall

response rates on the CYBOCS, but there was not a significant difference between groups when the CYBOCS was examined as a continuous measure (there was a trend and a significant difference in the completer sample). Although the results were promising, especially considering the active psychosocial control, the study was limited by small sample size, a narrow age range of young children, and mixed results.

In the study by Piacentini et al. (2011), the authors also compared an individual family based CBT treatment to a relaxation control group, although the age range of the study was wider. The authors found significant group differences (in favor of CBT) with regard to responder status, rate of change on the CYBOCS, and remission rates. However, there were not significant group differences on measures of OCD severity and functioning when examined as total scores. Both studies, conducted by independent research teams, demonstrated the superiority of family-based individual CBT to RT on some outcome measures, but the results were not unequivocal. Given the methodological strength of both studies, particularly the use of an active psychosocial control, and the fact that both studies found significant group differences (remission status and rate of change) on a gold-standard measure (the CYBOCS), a careful decision was made to raise the level of evidence for individual family focused treatment from *possibly efficacious* to *probably efficacious*. That said, the authors acknowledge the limitations of this literature (see also Evaluative Conclusions) and, in particular, the fact that the significant group differences were not found on the primary dimensional measure of OCD (the continuous CYBOCS).

Based on this review, both family-focused group CBT and non-family-focused group CBT can be considered *possibly efficacious* treatments. Family-focused group CBT was previously classified as possibly efficacious (Barrett et al., 2008) based on a study demonstrating its superiority to a waitlist control condition (Barrett et al., 2004). Although additional research examined this treatment (Farrell et al., in press; Farrell et al., 2010), both studies were uncontrolled open trials, resulting in no change for this treatment's evidence-based designation. Non-family-focused group CBT was previously designated as experimental due to an absence of controlled data (Barrett et al., 2008). The study by Olino et al. (2011) also lacks controlled data but similarly demonstrated significant reductions in OCD symptoms from pre- to post-treatment. Another recent study by Sochting & Third (2009) also examined non-family-focused group CBT for OCD, but is limited by a very small sample size, lack of control group, and significant results at follow-up but not at the end of acute treatment. Taken together, these studies indicate that non-family focused group CBT is a *possibly efficacious* treatment at this time.

Although traditional face-to-face CBT is a *probably efficacious* treatment, delivery of CBT using alternative, non face-to-face delivery modalities such as via the telephone (Turner et al., 2009) or webcam (Storch et al., 2011), can be designated a *possibly efficacious* treatment based on the promising results of Storch et al. (2011).

Moderators and Mediators of Treatment Response

The preceding classifications handle treatment outcome as if outcomes are generalizable to entire populations. However, when treatment outcome research incorporates investigations of predictors and moderators of outcome more sophisticated questions can be answered. Predictors indicate *which patients* are likely to benefit from a treatment. Moderators answer the question of *which patients in which treatment conditions* are likely to benefit from a treatment. Identifying predictors and moderators of treatment outcome is difficult because it requires large sample sizes, larger than those that are typically recruited for efficacy studies. Therefore, the number of studies that have been able to investigate predictors or moderators of treatment outcome in pediatric OCD is small. A review of 21 treatment studies in

pediatric OCD published between 1985 and 2007, found that a total of nine predictors were examined in more than one study (Ginsburg, Kingery, Drake, & Grados, 2008). These predictors were gender, age, duration of illness/age at onset, baseline severity of obsessive compulsive symptoms, type of OC symptoms, comorbid disorders/symptoms, psychophysiological factors, neuropsychological factors, and family factors. The authors concluded that neither gender, age, nor duration of illness (age at onset) was associated with treatment response. Baseline severity of obsessive compulsive symptoms and family dysfunction were associated with poorer response to CBT, and comorbid tics and comorbid oppositional defiant disorder/aggression predicted poorer response to medication-only treatment.

Ginsburg and colleagues (2008) conclusions' were similar to those drawn by another group of authors who looked across the full developmental range for predictors of treatment response (Keeley, Storch, Merlo & Geffken, 2008). Keeley and colleagues (2008) concluded that the most consistent predictors of outcome were symptom severity and symptom subtype (specifically hoarding). Family accommodation and family dysfunction have also yielded consistent associations with treatment response. Inconsistent evidence has been reported for predictor status for comorbid depression, comorbid tics, age of onset, and illness duration, insight, and motivation. Few studies have found demographic variables to be predictive of treatment response.

Since the last review in this journal, and not included in the Ginsburg and colleagues (2008) review of the pediatric OCD predictors/moderators literature, one group has published several articles on factors that are associated with poorer response to CBT (intensive or traditional outpatient) in their setting (Merlo et al., 2009; Storch, Bjorgvinsson et al., 2010; Storch, Merlo, Larson, Bloss et al., 2008; Storch, Merlo, Larson, Geffken et al., 2008; Storch, Merlo, Larson, Marien et al., 2008). The only addition to the conclusions from Ginsburg et al. (2008) is that comorbid disruptive behavior disorders (including attention-deficit/hyperactivity disorder) have a negative impact on treatment response.

Three articles that included information about predictors/moderators of outcome from the POTS I study have been published since the Ginsburg and colleagues (2008) review (Flessner et al., 2010; Garcia et al., 2010; Przeworski, 2012). Across these three articles and the previously reviewed article about tics in this sample (March et al., 2007) the conclusions about predictors and moderators from POTS I are that baseline symptom severity, OCD-related functional impairment, insight, externalizing symptoms, family accommodation, child and maternal expressed emotion (EE), and problems with executive functioning were predictors of outcome; and tic status and presence of OCD in a first degree relative were moderators of outcome. However, tic status was not associated with an attenuation of treatment effects for CBT containing treatments, only for medication alone. Whereas, family history of OCD was associated with a six-fold decrease in effect size in CBT monotherapy. Although from a different study and using a different variant of CBT, consistent with this finding, Peris and colleagues (2012) reported that parental blame, family conflict, and family cohesion were associated with treatment response in a family-based CBT.

All of the prior literature has been focused on variables that are present at pre-treatment and are not associated with treatment assignment. Two recent articles have begun to examine the factors that are associated with the treatment itself or the clients' reactions to the treatment itself. Keeley and colleagues (2011) found that stronger therapeutic alliance (as rated by child, parent and therapist) was predictive of better treatment outcome, and larger and more positive early alliance shifts (changes in child rating between sessions 1 and 5) were predictive of better outcome. Lewin and colleagues (2011) found that better treatment expectancies were associated with better treatment outcome, lower attrition, better

homework compliance, and reduced impairment. They also examined the relationships among the previously mentioned predictor variables and treatment expectancy and found that some of the same variables that predict treatment outcome also predict treatment expectations (i.e., baseline depressive symptoms, functional impairment, externalizing behavior problems) and in addition they also found relationships with number of comorbid psychiatric disorders and lower perception of control.

In summary, examination of predictors and moderators of treatment in pediatric OCD is underway but is still in the early stages, and there have been no studies to date of mediators. Despite its nascent state, this literature suggests further examination of the following: longer duration (>12 weeks) or more intensive visit schedule for those with more severe symptoms, augmentation strategies (either pharmacological or psychotherapies) that target externalizing symptoms, and family-based treatment strategies.

Evaluative Conclusions

What the Evidence Tells us Today (or Why CBT is Good for Pediatric OCD)

The results of this updated review clearly converge in support of CBT as an effective and appropriate first line treatment for youth with OCD (either alone or in combination with medication). Although no treatment for pediatric OCD has yet to be designated as a “well established” treatment, both individual and individual family based treatments have been shown to be probably efficacious treatments. Rates of remission range from 42% to 100% across probably and possibly efficacious treatments. Effect sizes in these same categories also range from .4 to 2.77.

There have been many new and high quality studies demonstrating the efficacy of CBT across different settings, formats, age groups, and ranges of severity and comorbidity. Since the original review, many published papers have been derivative treatments or variations on the core CBT model. These include different formats (intensive, group, family based), different emphases (cognitive focus, exposure only), and augmentative models (CBT+SSRI, CBT+DCS). Studies across different variants of treatment routinely find significant symptom reductions (See Table 1) which are promising, yet preliminary.

We have made methodological advances. A greater number of studies reviewed above utilized active treatments as comparison groups as compared to the original Barrett et al. (2008) review. This included the use of brief versions of CBT (Bolton et al., 2011; Franklin et al., 2011), a well-established medication treatment (POTS II), full CBT as a comparison (Storch, Murphy et al., 2010), and active psychosocial control treatments such as relaxation (Freeman et al., 2008; Piacentini et al., 2011). The ability to control for the nonspecific effects of treatment and/or to demonstrate the incremental benefit of a treatment in comparison to another form of CBT for pediatric OCD is an important step forward, yet it also has the potential to lead to more ambiguous results (i.e., a weaker signal) and smaller effect sizes (depending on the treatment against which an experimental condition is being compared).

Where We Still Have Room for Improvement

Although we have expanded the range of youth that are targeted with our treatment models in terms of age, severity, comorbidity, and medication status (See Table 1), certain methodological limitations have persisted. The vast majority of studies in this review that have included demographic information (See Table 1) have samples that are more than 65% Caucasian (range- 65%–100%) and in those studies that report SES, the samples are moderate to high income. Our current literature in this area makes it impossible to draw conclusions about treatment efficacy as a function of race/ethnicity. It also prevents us from

making accurate decisions about whether or not certain treatments require any kind of cultural adaptation. Without knowledge that a treatment does not work for a given group of youth, the task of cultural adaptation is less clear (Lau, 2006; Southam-Gerow, Rodriguez, Chorpita, & Daleiden, 2012)

In the original review, Barrett et al. (2008) also pointed to concerns regarding relatively "clean" samples with regard to levels of symptom severity and comorbidity. The studies reviewed here have improved upon this problem with some groups focusing specifically on more severe and comorbid criteria and allowing for less stringent inclusion criteria (e.g. Bjorgvinsson et al., 2008; Farrell et al., in press; Franklin et al., 2011; Whiteside & Jacobsen, 2010). That said, these studies have not (with the exception of Farrell et al., 2010) been designed as effectiveness studies. It remains unclear how our various CBT for OCD variants would fair in community samples of youth with OCD including both racially, ethnically, and economically diverse populations as well as more severe and complicated clinical presentations.

Barrett and colleagues (2008) also pointed to some other limitations in child OCD treatment literature at the time of their review. These included less than optimal response rates, limited examination of other non-symptom specific outcomes such as functioning and quality of life, and limited follow-up data. Based on our review, it seems that these issues have been addressed to some extent across this most recent group of studies (See Table 1), but there is still considerable room for improvement.

Why this Task is Complicated from a Methodological Standpoint (or Comparing Apples and Oranges)

The field as a whole has made significant gains, yet there are a number of issues that make the task of updating the evidence base in this area a complicated undertaking. In selecting and reviewing studies for this paper, we were limited by the criteria upon which we were basing our conclusions. Issues with choice of control group (e.g., waitlist versus a placebo or active control) and inconsistent outcomes and analytic strategies across reliable and valid measures (e.g., CGI and CYBOCS results differed) were common. As much as variation in the focus of CBT (e.g., cognitive emphasis vs exposure only), format of treatment (e.g., group or individual), or added ingredients (e.g., medication or DCS) are strengths of this growing literature, they also make comparing across studies akin to comparing apples and oranges.

For example, with regard to control groups, there was a great degree of variability across the studies reviewed here. A number of trials did not have a control and therefore were subject to the methodological limitations of an open trial. For the controlled studies, the first question was whether it was a waitlist or some other "active" control. Again, the limitations of a waitlist control are understood, but how does one compare across a wide range of "active" treatments including, for example, brief versions of CBT, well-established medication treatment, full CBT, or varied psychosocial controls? Although many studies were thoughtfully designed to control for non-specific effects of treatment and/or the incremental benefit of a novel variant of CBT, it is difficult to make comparisons across studies. Many preliminary studies set themselves up for a tough test by comparing against a rather powerful control (Freeman et al., 2008; Piacentini et al., 2011; Storch, Murphy et al., 2010). This tougher test may have led to ambiguous results across different measures and smaller effect sizes, however, these studies are being held to the same standard as others that may have used a less powerful control.

Another issue that makes for difficult comparisons involves the composition of the active treatment. As noted above, this is in some ways a strength of the literature but it makes it

harder to compare the specific results of one study to another when the treatment was in some ways the same (i.e., individually delivered CBT), but in other ways different (i.e., cognitive focus (Williams et al., 2010), exposure alone (Bolton & Perrin, 2008), intensive treatment (Bjorgvinsson et al., 2008; Whiteside & Jacobsen, 2010). In addition to variants with regard to the specific ingredients in a given CBT treatment, there is also the question of what proportion of the outcome is due to CBT when combination treatment (i.e., CBT plus medication) is what is being tested.

A final concern with regard to comparing across studies involves issues of measurement. This includes inconsistent outcomes across measures within a given study. For example, in the POTS I study, different results were found on the CYBOCS depending on whether it was examined categorically or continuously (Pediatric OCD Treatment Study Team, 2004). This was also a concern in the tests of family based treatment by Freeman et al (2008) and Piacentini et al. (2011) in which significant group differences were found on some measures of symptom severity (i.e., remission rates and rate of change on the gold standard CYBOCS) but not others (i.e., dimensional CYBOS). One possible explanation is of course related to some of these being preliminary studies that involve a small sample size or perhaps a test against a powerful control condition that leads to a weak or inconsistent signal in the results. Another issue is our use of common symptom measures, yet differing approaches to definitions of remission (CYBOCS less than 10, 11, 12, or 16 depending on the study) or clinically meaningful change (could be defined as any decrease in symptoms, 25% decrease in symptoms, 30% decrease in symptoms, etc…).

Why this Task is Complicated from a Clinical Standpoint

In evaluating the current evidence base for pediatric OCD treatment, another significant issue is the chasm that exists between the identification of empirically supported results and how a practitioner can best make use of these data. A major limitation in most published RCTs is a lack of significant detail with regard to the specifics of a given treatment. Although there is certainly great variability in terms of the amount of detail that is in a given study or whether there is a publicly available treatment manual, there are many cases where specific details are absent and/or treatment programs or manuals are unavailable. Additionally, lack of specific detail about the training of therapists or in some cases lack of detail about the therapists' prior experience with CBT, makes it difficult for many practitioners to use the treatment in the way it may have been executed in the manual.

In addition to the potential lack of clarity with regard to the specifics of treatment and therapist training, data about the specific evidence level of a given intervention may not be particularly helpful at directing which treatment (especially among many variants of CBT) is necessarily best for a given patient. The conclusions drawn from efficacy studies and reviews of the evidence level across studies draw conclusions at the group level in terms of who is likely to benefit from treatment. This is even true when one factors in predictors or moderators of treatment – those results still do not answer the question faced by individual patients – how will I do if I receive treatment x? or the question faced by practitioners choosing an approach to use with a specific patient – how will my patient do if I give them treatment x? These questions build upon the evidence base from reviews such as this one, but are part of a larger endeavor to define an evidence based decision model (Chorpita et al., 2011) to guide patient-centered care (Lambert, 2001).

Future Directions for Pediatric OCD Treatment Research

There is no question as to the significant advancements in the treatment of youth with OCD over the past 10–15 years. We have a number of manualized, yet flexible interventions that lead to significant and lasting treatment gains for a large number of patients. CBT is at this

point the best studied and most efficacious psychosocial treatment for OCD. We have begun to consider what might constitute the core ingredients of treatment (e.g., exposure alone) and a broader range of treatment responses (e.g., global functioning, quality of life). However, there are a number of areas that should be addressed in future research endeavors.

First, there remains a clear need for replication studies in this area. Despite the growth of the intervention literature in pediatric OCD, there is no treatment that has reached the level of "well established." This is in part due to the fact that some of the most rigorous studies of certain treatments have come from the same research groups (e.g. Franklin et al., 2011; Pediatric OCD Treatment Study Team, 2004) and therefore lack independence. The need for replication also stems from the fact that that many of the variations on CBT for pediatric OCD reviewed here have only been tested once and in some cases only in open trials. Although such replication studies are inherently less novel, and also perhaps less fundable, without such work we will be limited with regard to the level of evidence for these treatments.

Along these lines, it is also important that future trials include comparisons against active treatments. This is particularly relevant if we hope to determine whether there is differential benefit of certain formats of treatment over others (e.g., family based versus individual treatment). This work may also include studies of mechanism to isolate the key ingredients in treatment and/or to help make determinations about the most active ingredients of treatment and for whom they work.

Second, as called for in Barrett et al.'s (2008) original review, we need to explore further the patients who are partial- or non-responders to CBT. Although the overall response rates are encouraging in the context of an RCT, there is still more work to be done, particularly for the most severe and complex patients. At issue may also be our use of "one size fits all" treatment manuals despite emerging phenomenological research confirming the heterogeneity of OCD. Treatment refinement based on developing models of OCD subtypes and symptom dimensions may help to expand the reach of existing treatments to benefit those children with "atypical" OCD presentations (e.g. "Tourettic OCD," Mansueto & Keuler, 2005). With regard to work reviewed here, there is room for methodologically rigorous studies of intensive treatment models as well as for further exploration of novel treatment approaches including DCS (Storch, Murphy et al., 2010).

One such novel approach involves the use of technology (e.g., computer, smart phones) to deliver treatment (cite phone and webcam study). In addition to severity of illness, family barriers (i.e., scheduling issues, transportation, concerns about stigma, parental stress/ psychopathology) and system barriers (i.e., not enough providers, insurance barriers) prevent many youth from getting the treatment they need (Gunter & Whittal, 2010). Technology-based interventions have been shown to reduce the cost of treatment (Newman, 2000; Olmstead, Ostrow, & Carroll, 2010) and to enhance anonymity and privacy (Kendall, Khanna, Edson, Cummings, & Harris, 2011) thereby addressing family concerns about stigma. They also reduce clinician burden and increase therapist fidelity by automating aspects of treatment, such as assessment and documentation of symptoms (Khanna, Aschenbrand, & Kendall, 2007).

Third, and related to concerns about non-response, we must consider the need for non-CBT alternatives. Notably, all of the interventions included herein are not only rooted in a CBT model, but specifically focused on some variant of EX/RP. This narrowness is a concern. From a research standpoint, there is little in the way of empirical evidence to inform the treatment of youth with OCD who have failed to benefit fully from a course of the most efficacious treatment available. A trial currently underway in Norway (Ivarsson, et al., 2010)

will examine the issue of whether medication augmentation enhances outcome in pediatric OCD partial- or nonresponders to CBT, which will assist the field in developing an empirically informed strategy for addressing this somewhat common occurrence. However, many patients and families would prefer a psychological treatment alternative. Because of the “action” orientation required to engage in CBT, other psychotherapeutic approaches (e.g., motivational interviewing, family therapy, parent training, and acceptance and commitment therapy (ACT)) are often used in clinical practice, but these have not been studied formally, and the current federal funding climate in this country does not support studies designed to look for such incremental gains. These augmentative approaches, however, are often still rooted (with the possible exception of family therapy) in a CBT model.

As in other areas of anxiety, future results about attention bias modification or other means of altering more basic processes than just outward symptom modification will be helpful in broadening the literature base beyond CBT alone, but unfortunately, these efforts have not been pursued as yet in the context of pediatric OCD. From an affective neuroscience perspective, patients with OCD can be thought of as presenting with neurocognitive deficits in two key domains corresponding to the clinical presentation of the disorder: 1) inhibitory control (e.g., lack of control over intrusive thoughts, images, or mental rituals, inability to suppress rituals); and (2) cognitive flexibility (e.g., performance of rituals in accordance with rigid rules, focus on irrelevant stimuli rather than the larger whole) (Beers et al., 1999; Ornstein, Arnold, Manassis, Mendlowitz, & Schacher, 2008; Shin et al., 2008). Despite these face valid hypotheses and some supportive evidence from adult studies, little research has examined neurocognitive functioning among youth with OCD, and the studies in youth that have been done have yielded mixed results. Documenting neurocognitive deficits in a pediatric population with OCD has important implications for improving our understanding of the neurobiology of the disorder and for enhancing the efficacy of treatment approaches by guiding the development of more biologically-based adjuncts (i.e., cognitive remediation strategies) to existing CBT programs as well the possibility of stand-alone interventions.

From a clinical standpoint, it is imperative to conduct a functional analysis to determine the possible causes of non-response to treatment. Was it family accommodation or other family-based psychopathology? Was it the patient's psychiatric comorbidity, the severity of their OCD, or a lack of insight? Was it other patient or therapist factors? The adult literature shows that between session non-compliance predicts less robust response to CBT for OCD (Simpson et al., 2010). However, there is much work left to be done in identifying these predictive factors and then pursuing the potential moderators of these effects, which could in turn lead to more focused and ultimately more effective interventions. The pediatric OCD field has not advanced to this level of analysis as yet, and the large sample sizes that would be needed to examine such factors will necessitate creative designs and collaborations that could afford sufficient statistical power for such analyses.

Fourth, and also as called for in Barrett et al's original review, we must work to expand further the populations of youth (e.g., increase racial/ethnic diversity, range of SES, comorbidity) served by these treatments and the settings (e.g., outside of academic medical settings) in which they are provided (Barrett et al., 2008). These efforts are underway in OCD (Farrell et al., 2010; Valderhaug et al., 2007) and much further along in other pediatric anxiety disorders (Barrington, Prior, Richardson, & Allen, 2005; Kendall, Settipani, & Cummings, 2012; Southam-Gerow et al., 2010). However, despite superior efficacy of empirically supported treatments for child mental health problems in general, significant problems with implementation have been reported when transitioning treatment from university laboratories to community settings (National Institute of Mental Health, 1998). In addition to the obvious importance of doing this type of research, we must consider that

such indicators of effectiveness also should factor into our overall reviews of the evidence base (Chorpita et al., 2011)

In line with efforts to increase the evidence base of treatments, efforts must be made to understand how best to disseminate, implement, and sustain such treatments in community settings. Powell et al. (2012) have identified six processes relevant to the implementation of evidence-based treatments, including planning, educating, financing, restructuring, managing quality, and attending to policy context. An added complication in OCD, however, is its overall low base rate. This complicates the problem of testing treatments in community settings both due to lack of patient volume in any one setting as well as potential lack of relevance for clinicians to invest great amounts of training time in mastering an intervention they may not use on a routine basis.

Finally, it is important to underscore the significant, positive advancement of both the pediatric OCD treatment literature as well as our use and understanding of evidence based treatment summaries such as this one. Perhaps the next frontier will involve greater thought as to how we guide treatment choices among many good alternatives and how we use such “evidence level determinations” as part of an evidence informed decision model (Chorpita et al., 2011; Daleiden & Chorpita, 2006). This process may be one in which we overlay some empiricism on what at this point remains a clinical process of deciding what treatment (among those with sufficient evidence) is best for whom.

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Table 1

Studies Included in Review

Authors	Sample	Treatment(s)	Trial Type	Measures	Results	Effect Size	Follow up
Individual CBT (ICBT)							
Bjorgvinsson et al. (2008)	*N* = 23 Age 13–17 48% female Ethnicity: 95.9% Caucasian Comorbidity: 65% had comorbid diagnosis; 35% mood disorder, 17% ADHD, 17% developmental disorder, 13% other anxiety, 9% tic disorder, 9% eating disorder	ICBT - 4–21 weeks (*M* = 9.5 weeks) intensive inpatient treatment with group practice component	Naturalistic	CY-BOCS, OBQ-44, STAI, RADS-2, TAF-R, IUS-12	70% participants showed clinically significant decrease on CY-BOCS at post-treatment	Within-Group: CY-BOCSpre-post = 1.07	None
Whiteside & Jacobsen (2010)	*N* =16 Age 10–18 43% female Ethnicity: NR Comorbidity: 43.75% had 1–5 comorbid diagnoses; 25% GAD, 25% specific phobia, 25% depressive disorders, 12.5% SAD, 12.5% eating disorder, 6.25% ADHD, 6.25% Social phobia	ICBT - 5 days (intensive)	Open	ADIS-C, CY-BOCS, SCAS, CSDS	CYBOCS: 83% participants scores < 19.52 (2 standard deviations below mean of pretreatment scores) and > 6 points change in CY-BOCS scores	Within-Group: CY-BOCSpre-post = 2.77	5 months
Bolton & Perrin (2008)	*N* = 20 Age 8–17 30% female Ethnicity: 65% Caucasian Comorbidity: NR	E/RP only - 10 sessions in 7 weeks (1–3 times weekly); Waitlist - 4–7 weeks	RCT	ADIS-C, CY-BOCS, CHOCI	CYBOCS: 42%↓, CHOCI: 58%↓ (includes 2 non-completers), CHOCI: 71% ↓ (8 completers only)	Between-Group: ERP-WLcybocs = 1.23 (ITT); ERP-WLcybocs = 1.64 (Completers)	3 months
Bolton et al. (2011)	*N* = 96 Age 10–18 yrs 60% female Ethnicity: NR Comorbidity: 2.1% tic disorder, 13.5% ODD, 8.3% ADHD, 9.4% MDD	Full ICBT (cognitive focus) - 12 sessions; Brief ICBT (cognitive focus) - 5 sessions; Waiting-list - 12 weeks	RCT	CY-BOCS, ADIS-C/P, OCI, COIS-C, COIS-P, MASC, CDI, MANSA, HSUQ, CRIQ, CRAS	IT: Full CBT: 61.1% remission, Brief CBT: 48.6% remission, WL: 8.3% remission; both treatment groups improved significantly on other outcome variables compared to waitlist	Between-Group: FULL-WLcybocs = 2.2 ; BRIEF-WLcybocs = 1.6	3 months
Williams et al. (2010)	*N* = 21 Age 9–18 years 38% female Ethnicity: NR Comorbidity: 50% had comorbid diagnosis, 19% GAD, 19% specific phobia, 19% SAD, 9.5% ADHD, 9.5% social phobia,	ICBT (cognitive focus) -10 sessions;	RCT	CY-BOCS, ADIS-C, OCI, CDI, MASC, CRAS, CRIQ	Significant improvement in CYBOCS scores for CBT group; no significant group effects	Between-Group: ICBT-WLcybocs: 1.07	6 months

Authors	Sample	Treatment(s)	Trial Type	Measures	Results	Effect Size	Follow up
	4.8% dysthymia	Waitlist - 12 weeks			on other measures		
Franklin et al. (2011)	*N* = 124 Age 7–17 yrs Female: 53% Ethnicity: 92.7% Caucasian Comorbidity: 74% had comorbid diagnosis, 27% ADHD, 55% Anxiety/ Mood, 19% Tic, 2% Externalizing	Medication Management (MM) only - 7 sessions in 12 weeks; instructions in ICBT (iICBT) - 7 sessions in 12 weeks; MM + ICBT - 14 sessions in 12 weeks	RCT	CY-BOCS, ADIS-C, NIMH-GOCS, Conners/March Developmental questionnaire, CGI-S	CY-BOCS score reduction of 30% or more from baseline to wk. 12 to be considered significant: MM + CBT = 68.6%; MM + iCBT = 34%; MM only = 30%; NIMH-GOCS - MM +CBT was superior to other groups	Between-Group: MM+CBT-MMcybocs = .85; MM+iICBT-MMcybocs = .16	None
Storch et al. (2010)	*N* = 30 Age 8–17 years 37% Female Ethnicity: 97% Caucasian Comorbidity: 73% had comorbid diagnosis, 46.6% ADHD, 16.6% GAD, 13.3% ODD, 10% Tourette's Syndrome, 10% MDD, 6.6% Social phobia, 6.6% enuresis, 3.3% specific phobia	ICBT - 10 sessions; ICBT + D-cycloserine; ICBT + placebo	RCT	CY-BOCS, ADIS-IV-P, CGI-S, MASC, CDI	CYBOCS: CBT + DCS = 57%↓ in symptoms; CBT + placebo = 41%↓ in symptoms	Between-Group: DCS-PLACEBOcybocs = .67	None
Non-family-focused Group CBT							
Olino et al. 2011	*N* = 41 Age 6–17 years 53% female Ethnicity:NR Comorbidity: 12.2% Anxiety disorder; 14.6% Depressive disorder; 24.4% ADHD	Group CBT- up to 4 group sesssions/week, M = 12.13 weeks	Naturalistic	Cy-BOCS, DY-BOCS, SCARED, MFQ	CY-BOCS score decreased over the course of treatment (from M = 19.42 to M = 11.39)	Within-Group: CY-BOCSpre-post = 1.19	None
Sochting & Third (2009)	*N* = 7 Age 15–17 43% female Ethnicity: NR Comorbidity: 57% (4 out of 7) had a comorbid diagnosis (including ADHD, BDD, Tourette's and Depression)	Group CBT - 10 weekly 2-hour sessions	Pilot Study (Open)	DSM-IV diagnosis, YBOCS, BDI, BAI, OBQ-87	YBOCS: marginally significant ↓ (from M = 28.3 to M = 20.3)	Within-Group: CY-BOCSpre-post = 1.12	1 year
Family-focused Group CBT							
Farrell et al. (2012)	*N* = 43 Age 7–17 yrs 30% female Ethnicity: NR Comorbidity: 84% had comorbid diagnosis; 35% had PDD, 12% depressive symptoms, 19% ADHD	13 weekly child group CBT sessions + 3 structured parent group sessions + 2 individual family review sessions + 2 post-treatment booster sessions	Pilot Study (Open)	ADIS-P, NIMH-GOCS, CY-BOCS, COIS- C/P, MASC, CDI, FAS	45%↓ in CY-BOCS scores, 60.5% of participants were responders (>= 25% reduction in CY-BOCS scores), no significant differences based on comorbidity	Within-Group: CY-BOCSpre-post= .92	6 months
Family-Focused Individual CBT							

Authors	Sample	Treatment(s)	Trial Type	Measures	Results	Effect Size	Follow up
– Piacentini et al. 2011	*N* = 71 Age 8–17 yrs 63% female Ethnicity: 77.5% Caucasian Comorbidity: 66.2% had comorbid diagnosis (tic disorders, anxiety disorders, ADHD, ODD, Mood disorders, other)	Child CBT + Family intervention - 12 sessions in 14 weeks; Psychoeducation + Relaxation Therapy	RCT	CY-BOCS, ADIS-IV, COIS-R, CGI-I, FAS-PR	CYBOCS <11 (remission): 42.5% for FCBT, 17.6% for PRT; CY-BOCS: FCBT 46.2% ↓, PRT = 32% ↓	Between-Group: FCBT-PRTcybocs = .40	1 month and 6 months
Freeman et al. (2008)	*N* = 42 Age 4–8 years 57% female Ethnicity: 80% white Comorbidity: 54.8% comorbid internalizing diagnoses, 35.7% comorbid externalizing diagnoses, 9.5% tic disorder, 19% ADHD	Family-focused ICBT- 12 sessions in 14 weeks; Relaxation Therapy	RCT	K-SADS-PL, CY-BOCS, CGI-I, NIMH-GOCS, Conners Parent Rating Scale-Revised (Long Version), Beck Depression Inventory, OCI, BSI, SCARED	ITT: CBT - 50% remission (posttreatment CY-BOCS <= 12), RT - 20% remission; Completers only: CBT - 69% remission, RT - 40% remission	Between-Group: CBT-RTcybocs = .53 (ITT); CBT-RTcybocs = .85 (completers)	None
Ginsburg, Burnstein, Decker & Drake (2011)	*N* = 7 Age 3–8 yrs 57% Female Ethnicity: 100% Caucasian Comorbidity: 43% (3 out of 7) had comorbid diagnosis (SAD, social phobia, GAD, ODD, ADHD, specific phobia)	Family-focused ICBT-12 weekly sessions	Multiple Baseline Design	ADIS-C,WROC, FAS-PR-R, CY-BOCS, COIS-RP, CGI-I, BASC-2, FAD	CY-BOCS: 100% demonstrated at least a 25% reduction in scores; CGI-I: 86% rated as responders (“much improved”)	Within-Group: CY-BOCSpre-post = 2.56	1 month
Merlo et al. 2010	*N* = 16 Age 6–17 yrs 37.5% female Ethnicity: 81.25% Caucasian Comorbidity: NR	Intensive (14 sessions in 3 weeks) family-based ICBT + 3 Motivational Interviewing (MI) sessions; Intensive family-based ICBT + 3 psychoeducation (PE)	RCT	ADIS-C/P, CY-BOCS, CGI-S, CGI-I	At session 5, mean CY-BOCS score for MI group was significantly lower than for PE group, but by posttreatment, there were no significant group differences in CY-BOCS scores	Between-Group (at session 9): ICBT +MI-ICBT+PEcybocs = 1.18	None
Storch et al. (2010)	*N* = 30 Age 7–19 yrs 50% female Ethnicity: 77% Caucasian Comorbidity: 84% had comorbid diagnosis; 36.6% ADHD, 33.3% Disruptive Behavior Disorders, 26.6% GAD, 26.6% Depressive disorders, 13.3% Tic Disorder/ Tourette's	Intensive (14 sessions in 3 weeks) family-based ICBT	Open	ADIS-IV-P, CY-BOCS, CGI-S, COIS-C/P, MASC, CDI, CBCL, FAS	Symptom severity reduced by 54% from pretreatment levels at both posttreatment and follow up	Within-Group: CY-BOCSpre-post = 2.37	3 Months

Authors	Sample	Treatment(s)	Trial Type	Measures	Results	Effect Size	Follow up
	Syndrome, 10% Social Phobia, 3.3% SAD, 3.3% Enuresis						
Family-Focused Individual & Group CBT							
Farrell et al. (2010)	*N* = 35 Ages 7–17 46% female Ethnicity: 100% Caucasian Comorbidity: 54% had comorbid diagnosis	Family-based CBT - 12 sessions (+ 2 post-treatment booster sessions), allowed for individual (1 hr) and group (1.5 hrs) treatment delivery	Effectiveness	ADIS-C/P, NIMH-GOCS, CY-BOCS, MASC, CDI, SCAS, COIS	CY-BOCS: 61% ↓, NIMH-GOCS: 58%↓, 63% recovered (CY-BOCS <= 10)	Within-Group: CY-BOCSpre-post = 2.13	1 month and 3 months
Technology-Based CBT							
Storch et al. (2011)	*N* = 31 Age 7–16 yrs Female: 39% Ethnicity: 74% Caucasian, Comorbidity: 96.7% had comorbid diagnosis (including GAD, Social Phobia, MDD, ADHD, ODD, Tourette's/Tic Disorder)	Family-based ICBT - 14 sessions in 12 weeks, delivered via web-camera (W-CBT); Waitlist control	RCT	ADIS-IV-C/P, CY-BOCS, CGI-S, CGI-I, COIS-C/P, MASC, CDI, Family accommodation, satisfaction with services	56% reduction in OCD symptom severity, 81% of participants responded to treatment	Between-Group: WCBT-WLcybocs = 1.36	3 months
Turner, Heyman, Futh & Lovell (2009)	*N* = 10 Ages 13–17 years 20% female Ethnicity: NR Comorbidity: Comorbid diagnoses included Tourette's Syndrome (n=2), another anxiety disorder (n=2), MDD (n=2), eating disorder (n = 1)	Up to 16 (weekly) telephone sessions of ICBT with parents	Pilot Study (Open)	CY-BOCS, CHOCI	70% of participants had a CY-BOCS score of 10 or below post-treatment, significant CHOCI: significant decreases in OCD symptom severity (adolescent and parental report)	Within-Group: CYBOCSpre-post = 2.27	6- and 12-month follow up

Abbreviations Used

ADHD = attention-deficit/hyperactivity disorder

ADIS:C = Anxiety Disorders Interview Schedule for DSM-IV: Child Version

ADIS-CSR: Anxiety Disorders Interview Schedule for DSM-IV Clinician Severity Rating

BAI = Beck Anxiety Inventory;

BDI = Beck Depression Inventory

BSI = Brief Symptom Inventory

CBCL = Child Behavioral Checklist

CDI = Children's Depression Inventory

CGI-S = Clinical Global Impression- Severity Scale

CHOCI = Children's Obsessional Compulsive Inventory

COIS = Child OCD Impact Scale

CRAS = Children's Responsibility Attributions Scale

CRIQ = Child Responsibility Interpretation Questionnaire

CSDS = Child Sheehan Disability Scale,

CY-BOCS = children's Yale-Brown Obsessive-Compulsive Scale

CBT = cognitive behavioral therapy

DASS-21 = Depression Anxiety Stress Scale-2

DY-BOCS = Dimensional Yale-Brown Obsessive-Compulsive Scale

ERP = exposure and response prevention

FAD = Family Asessment Device

FAS = Family Accommodation Scale

HSUQ = Health Service Use Questionnaire

ICBT = individual cognitive behavioral therapy

IUS-12 = Intolerance of Uncertainty Scale

KSADS-PL = Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version

NR = not reported

OBQ-44 = Obsessive Belief Questionnaire (44 Item Version)

OBQ-87 = Obsessive Beliefs Questionnaire (87 Item Version)

OCD = obsessive-compulsive disorder

OCI = Obsessive-Compulsive Inventory

MASC = Multidimensional Anxiety Scale for Children

MASC-OC: Multidimensional Anxiety Scale- Obsessive Compulsive Screen

MANSA = Manchester Short Asessment of Quality of Life

MFQ = The Moods and Feelings Questionnaire

NIMH -GOCS = National Institute of Mental Health - Global Obsessive Compulsive Scale

PDD = pervasive developmental disorder;

PPVT-4 = Peabody Picture Vocabulary Test - Fourth Edition

RADS-2 Reynolds Adolescent Depression Scale, 2nd edition

RT = relaxation therapy

SCARED = Screen for Child Anxiety-Related Emotional Disorders

SCAS = Spence Children's Anxiety Scale

SRI = serotonin reuptake inhibitors

STAI = State-Trait Anxiety Inventory

TAF-R Thought Action Fusion Scale - Revised

WROC = Weekly Parental Ratings of OC Behaviors

YBOCS = Yale-Brown Obsessive-Compulsive Scale

Table 2

JCCAP Evidence Base Updates EBT evaluation criteria

Methods criteria

M.1. **Group design:** Study involved a randomized controlled design

M.2. **Independent variable defined:** Treatment manuals or logical equivalent were used for the treatment

M.3. **Population clarified:** Conducted with a population, treated for specified problems, for whom inclusion criteria have been clearly delineated

M.4. **Outcomes assessed:** Reliable and valid outcome assessment measures gauging the problems targeted (at a minimum) were used

M.5. **Analysis adequacy:** Appropriate data analyses were used and sample size was sufficient to detect expected effects

Level 1: Well-Established Treatments

Evidence criteria

1.1 Efficacy demonstrated for the treatment in at least two (2) independent research settings and by two (2) independent investigatory teams demonstrating efficacy by showing the treatment to be either:

1.1.a. Statistically significantly superior to pill or psychological placebo or to another active treatment

OR

1.1.b. Equivalent (or not significantly different) to an already well-established treatment in experiments

AND

1.2. **All five (5)** of the Methods Criteria

Level 2: Probably Efficacious Treatments

Evidence criteria

2.1 There must be at least two good experiments showing the treatment is superior (statistically significantly so) to a wait-list control group

OR

2.2 One or more good experiments meeting the Well-Established Treatment level with the one exception of having been conducted in at least two independent research settings and by independent investigatory teams

AND

2.3 All five (5) of the ***Methods Criteria***

Level 3: Possibly Efficacious Treatments

Evidence criterion

3.1 At least one good randomized controlled trial showing the treatment to be superior to a wait list or no-treatment control group

AND

3.2 All five(5) of the ***Methods Criteria***

OR

3.3 Two or more clinical studies showing the treatment to be efficacious, with two ore more meeting the last four (of five) ***Methods Criteria,*** but none being randomized controlled trials

Level 4: Experimental Treatments

Evidence criteria

4.1. Not yet tested in a randomized controlled trial

OR

4.2. Tested in 1 or more clinical studies but not sufficient to meet level 3 criteria.

Level 5: Treatments of Questionable Efficacy

5.1. Tested in good group-design experiments and found to be inferior to other treatment group and/or wait-list control group; i.e., only evidence available from experimental studies suggests the treatment produces no beneficial effect.

Adapted from Silverman and Hinshaw (2008) and Division 12 Task Force on Psychological Interventions' reports (Chambless et al., 1996, 1998), from Chambless and Hollon (1998), and from Chambless and Ollendick (2001). Chambless and Hollon (1998) described criteria for methodology.

Table 3

Evidence Base Update for Pediatric OCD Treatment: Summary Table

Level 1: Well-established	Level 2: Probably efficacious	Level 3: Possibly efficacious	Level 4: Experimental	Level 5: Not effective
----	Individual CBT	Family-focused Group CBT	Technology Based CBT	----
----	Family-focused Individual CBT	Non-family-focused Group CBT		----