

# An Interactive Computer-Administered Self-Assessment and Self-Help Program for Behavior Therapy

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Behavior therapy for obsessive-compulsive disorder (OCD) is extremely effective and usually conveys lasting benefits. Unfortunately, behavior therapy is not widely available and is usually quite costly in the few settings where it can be obtained. The essential features of effective behavior therapy are identifying triggers of obsessions, rituals, and discomfort; designing personalized exposure and ritual prevention (E & RP) goals; and encouraging and monitoring E & RP sessions of sufficient frequency and duration for habituation to occur. A computer program (BT STEPS) was designed to assist OCD sufferers in carrying out self-assessment and self-help behavior therapy. The program has nine clinical steps, 12 computer-controlled interactive voice response (IVR) telephone calls (some used repeatedly), and more than 1000 digitized voice files that depend on the progress that patients report during calls. BT STEPS has been studied in two trials at three sites with a total of 65 patients. In both trials, patients who experienced behavior therapy had substantial reductions in OCD severity as assessed by the Yale-Brown Obsessive Compulsive Scale. Approximately two thirds of those who participated in two or more E & RP sessions were much or very much improved. Patients liked using the program, and 71% thought their lives improved as a result. BT STEPS makes behavior therapy for OCD patients potentially available to anyone with a touch-tone telephone. It is intended for use under the supervision of a clinician and can be used in conjunction with pharmacotherapy.

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Obsessive-compulsive disorder (OCD) is common,<sup>1</sup> chronic,<sup>2</sup> usually distressing, and sometimes so severe that it is incapacitating. Costs for patients and their families are high.<sup>3</sup> After the introduction of the potent serotonin reuptake inhibitor (SRI) clomipramine in 1966 and Meyer's report in the same year that response prevention was an effective behavioral treatment for OCD,<sup>4</sup> practical management of the disorder became possible. Before 1966, neurosurgery was the only effective treatment. However, it was viewed as so extreme that it was seldom employed, and only today is neurosurgery beginning to be evaluated in controlled research designs.

## THE ROLE OF SRIs

Clomipramine,<sup>5</sup> fluoxetine,<sup>6</sup> fluvoxamine,<sup>7</sup> paroxetine,<sup>8</sup> and sertraline<sup>9</sup> are all potent SRIs that have been shown to be effective treatment of OCD in multicenter placebo-controlled trials. Behavior therapy consisting of exposure in vivo with ritual prevention has also proven its effectiveness in controlled trials. Foa and Kozak<sup>10</sup> recently reviewed short-term outcome of behavior therapy in 330 patients treated in 13 trials and found 83% of patients responded after a mean of 15 sessions (range, 10-25 sessions). The few studies that have attempted to compare the efficacy of potent SRIs with that of behavior therapy have found behavior therapy at least as effective as SRIs,<sup>11-15</sup> and these results are supported by meta-analyses<sup>16-20</sup> (Figure 1). In 13 trials in which the Yale-Brown Obsessive Compulsive Scale (Y-BOCS),<sup>21</sup> the recognized measure of change in OCD severity for the past decade, was used as a measure of symptom change,<sup>15,22-31</sup> the weighted arithmetic mean reduction from baseline to endpoint was 11.84. It was 7.51 for the five potent SRIs that have received FDA approval for treatment of OCD, using the best dose (where available in fixed-dose studies), without subtraction of placebo response.

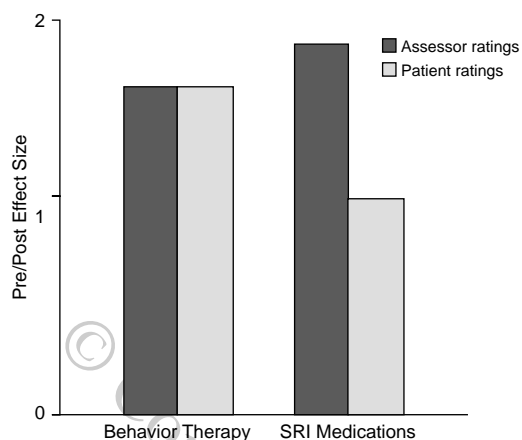
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**Figure 1. Meta-Analysis of Behavior Therapy (by Exposure and Response Prevention) and SRI Medication Treatment of OCD\***



\*Adapted from reference 18.

While pitting these effective treatments against each other is a pleasant pastime for sectarians, its interest to sufferers is minimal. The few studies that have attempted to investigate combining these two modalities suggest that combination therapy may be optimal treatment for most patients, although most improvement may be attributable to behavior therapy.\* While both SRIs and behavior therapy are unquestionably effective treatments, there are features that distinguish each modality and merit consideration by clinicians choosing treatments for their patients.

SRIs are widely available, and clinicians are experienced in their use. Although side effects may occur, most OCD patients tolerate them well; no more than 15% of patients discontinue treatment in short-term trials because of side effects.<sup>34</sup> A small proportion of patients are unwilling to take medication because of an obsession about contamination, with medication seen as a “contaminant.” SRIs almost always lose their benefit shortly after they are discontinued,<sup>35-38</sup> but usually remain effective until they are stopped. SRIs rarely increase obsessions or compulsions to ritualize, and when these exacerbations do occur, they usually abate within a few days or weeks.

**THE ROLE OF BEHAVIOR THERAPY**

Behavior therapy is at least as effective as SRIs in acute treatment and is clearly more effective in maintaining gains after treatment has stopped. Two recent neuroimaging studies at UCLA<sup>31,39</sup> found that patients with OCD who are successfully treated with behavior therapy show changes in cerebral metabolism similar to those produced by successful treatment with SRIs (Table 1 and Figure 2).

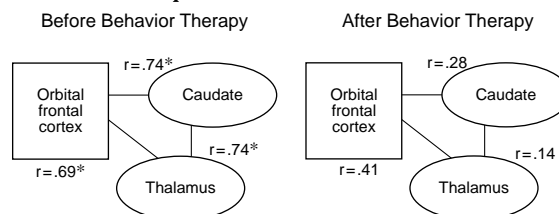
\*References 11, 12, 14, 15, 24, 32, 33, and 54.

**Table 1. Positron Emission Tomographic (PET) Changes in OCD Patients Successfully Treated With SRI Drugs or Behavior Therapy\***

Region	Drug	Behavior Therapy
R head of caudate nucleus	p = .001	p = .009
R anterior cingulate gyrus	p = .03	p = .99
L thalamus	p = .03	p = .78

\*Data from reference 39.

**Figure 2. Behavior Therapy Appears to Break a Functional Cerebral “OCD-Loop”†**



\*Statistically significant.

†Adapted from reference 31.

Foa and Kozak<sup>10</sup> also reviewed 16 studies reporting follow-up of patients treated with exposure and ritual prevention (E & RP). They reported weighted averages of persistent response in 76% of 376 patients at 29 months of follow-up. Some patients have substantial short-term increase in obsessions, discomfort, and urge to ritualize as a result of ritual prevention, an essential component of behavior therapy. Most can tolerate this transient increase in pursuit of long-term, lasting reductions in obsessions, discomfort, and urge to ritualize. Because medication must be continued indefinitely, whereas behavior therapy can be given for a single course of treatment with occasional booster sessions for some patients, the cost of behavior therapy is ultimately less than the cost of treating OCD with medications. The major drawback of behavior therapy is its limited availability. At an American Psychiatric Association breakfast symposium in May 1996, no more than 10% of psychiatrists attending raised their hands when asked whether they personally provided exposure in vivo and ritual prevention or could refer their patients for behavior therapy that included those essential components. This informal survey is consistent with responses obtained from audiences across the United States.

Another issue regarding behavior therapy is the quality of treatment provided. Although some patients may state that they have had behavior therapy and have received elements thought by proponents to be effective behavior therapy components, often these patients have never had a thorough behavioral assessment. Nor have they experienced exposure in vivo with ritual prevention, the cornerstones of effective behavior therapy for OCD sufferers.

**Table 2. Elements of a Minimal Trial of Behavior Therapy for OCD\*†**

10 to 20 hours of treatment with exposure and response prevention (as much as possible being exposure in vivo)
Good compliance with both exposure and response prevention (ie, no physical or mental rituals during exposure)
Unimportant whether treatment is assisted by therapist, assisted by family member, or self-administered

\*Data from reference 42.

†This regimen should result in some improvement in most OCD patients. If any significant response is seen to this trial, treatment should be continued longer to achieve maximum benefit.

Goisman and colleagues<sup>40</sup> reported on 25 OCD patients who received behavior therapy in anxiety disorder services at prestigious academic institutions. Forty percent stated that during their therapy sessions they had been asked to list their feared situations, a request that suggested that they underwent some behavioral assessment. Twenty-eight percent received exposure in vivo and possibly ritual prevention as a component of exposure in vivo, although that was not explicitly stated. Forty percent received relaxation, which is inert and now used by researchers as a control procedure in behavior therapy trials of E & RP; 28% received imaginal exposure, at best a weak treatment for OCD; 32% had modeling, a technique of limited value; 48% had thought stopping, which is helpful if applied against mental rituals but is counterproductive if used, as most clinicians have been instructed, to stop distressing obsessions; and 44% had distraction, a pernicious avoidance instruction that usually worsens OCD.

As another indication of the limited understanding of behavior therapy for OCD and the failure to apply effective treatment elements even by those who call themselves behavior therapists, Turner et al.<sup>41</sup> reported from a survey of behavior therapists that the mean cost of behavior therapy for OCD was \$4370 and the mean number of sessions 46. By contrast, Foa and Kozak<sup>10</sup> found the mean number of sessions involving 330 patients in 13 trials at expert behavior therapy centers was 15 (range, 10–25). Session length ranged from 40 to 120 minutes, with a total face-to-face time of between 11 and 30 hours, or a cost of about \$1100 to \$3000, since the centers of excellence often treat patients who have failed usual care. This would correspond to a cost of less than \$1500. Greater costs are presumably associated with use of less effective techniques.

To provide a straightforward guide to clinicians, we have distilled, from these and other reviews, the elements of a minimal trial of behavior therapy for OCD<sup>42</sup> (Table 2).

Despite 30 years of effort on the part of behavior therapists to persuade colleagues of the advantages of exposure in vivo with ritual prevention, behavior therapy is still available to very few OCD patients. By contrast, clinicians have rapidly embraced potent SRIs as treatment for OCD. Perhaps clinician reluctance to use behavior therapy for OCD results from the relative absence of behavior therapy

**Table 3. Frequency of Symptom Subtypes Reported in Behavioral Treatment Studies of OCD\***

Symptom	Number of Patients	Percent of Total
Cleaning compulsions only noted	286	47.6
Checking compulsions only noted	162	27.0
Obsessions without compulsions noted	81	13.5
Multiple compulsions noted	48	8.0
Other <sup>†</sup> compulsions noted	24	4.0
All patients with symptom subtype noted	601	100

\*Adapted from reference 49.

<sup>†</sup>Slowness (N=14), repetition (N=8), order/exactness (N=2).

training in residency programs and the discomfort that many clinicians experience when inducing even a short-term increase in patient distress through ritual prevention. Restoring patient functioning should be a higher aim for physicians than relieving suffering, even at the cost of an increase in short-term patient discomfort.

To address the problem of making behavior therapy available to more OCD sufferers in need of this treatment, the Obsessive Compulsive Foundation (Milford, Conn.) has launched two major initiatives: (1) sponsoring intensive institutes designed to train and supervise therapists in high-quality behavior therapy for OCD and (2) providing free expert behavior therapy to individuals in clinical and financial need. However, this approach alone is insufficient to meet OCD patients' enormous need for behavior therapy. Even in the United Kingdom, where Professor Isaac Marks's initial nurse-clinician training program in behavior therapy spread to three other centers, only 200 nurse-clinician behavior therapists have been trained in the past 20 years (Marks I. 1996. Personal communication).

Emerging community-based programs in Massachusetts and Florida have recently demonstrated that paraprofessionals can be trained and supervised by behavior therapy experts to provide treatment successfully in the patient's home, school, or workplace at comparatively low cost. Also, several self-help books have been published in recent years to provide helpful and accurate information about behavior therapy for OCD patients.<sup>43–48</sup> Although there is currently no empirical evidence that these books, in themselves, are able to facilitate successful behavior therapy for OCD patients, at least one study is now ongoing in northern New England to investigate the efficacy of one such publication.

A review of the literature on OCD and behavior therapy confirms that exposure with ritual prevention has been most consistently reported as effective in treating cleaning and checking problems, but is less consistently reported as effective in treating problems like hoarding, compulsive slowness, superstitions, and symmetry obsessions<sup>49</sup> (Table 3). In addition, strong doubting obsessions or unwillingness to undergo E & RP often contributes to patient failure to comply with standard behavior therapy and hence to lack of improvement.

**Table 4. Comparison of Cognitive Therapy vs. Exposure Therapy for OCD\***

Assessment	Cognitive (N = 28)	Exposure (N = 29)
Baseline Y-BOCS	24	25
Final Y-BOCS	13	17

\*Data from reference 27. Abbreviation: Y-BOCS = Yale-Brown Obsessive Compulsive Scale.

**Table 5. The Nine "Steps" Comprising BT STEPS\***

1. Learning about BT STEPS
2. Identifying major rituals and their costs
3. Identifying triggers and setting goals
4. Involving a relative or friend in cotherapy
5. First exposure and ritual prevention (E & RP)
6. Fine-tuning
7. Continuing treatment
8. Troubleshooting
9. Maintaining gains

\*From reference 53.

Recognition that there are significant gaps in our knowledge of OCD has led several investigators to develop refined behavioral treatments targeted at specific problems. For example, Frost and Hartl<sup>50</sup> have recently developed a manual for behavioral treatment of compulsive hoarding that incorporates treatments targeted at the specific cognitive deficits their group has identified in such patients. This treatment approach is just beginning to be tested, but early results are encouraging.

Van Oppen and associates<sup>27</sup> in the Netherlands have recently modified Beck's cognitive therapy for depression<sup>51</sup> to address directly the cognitive errors that their group has identified in patients with OCD. A recent, carefully controlled study found that this OCD cognitive treatment approach (with no exposure or ritual prevention permitted) produced as much improvement as treatment with E & RP.<sup>27</sup> The results of this 16-week study are summarized in Table 4.

Such innovative treatment methods hold promise for the future. However, our frontline treatment for OCD, bolstered by decades of research findings, remains E & RP.

### BT STEPS

"Face the thing you fear the most and it will be the certain death of it." —Alfred, Lord Tennyson

The essential element of behavior therapy for OCD patients is exposure to triggers of obsessions, discomfort, and rituals until habituation occurs. Ultimately, behavior therapy is a self-help treatment because habituation must occur within the patient. While therapist assistance during exposure sessions is sometimes helpful, the most comprehensive review of the evidence on this issue concluded that "the treatment effect of self-controlled exposure in vivo is

not enhanced by therapist or spouse involvement."<sup>18</sup> Because of the difficulty in persuading and training clinicians to provide behavior therapy, and because of the documented success of direct patient-computer programs to treat phobias<sup>52</sup> and depression,<sup>53</sup> we, with colleague Professor Isaac Marks, decided to develop a computer-administered behavior therapy program for OCD called BT STEPS. Behavior therapy involves education, behavioral assessment, treatment planning, treatment, and relapse prevention. BT STEPS consists of nine steps to address these five major features of behavior therapy (Table 5).

While the idea of computer-administered therapy is novel, use of a telephone as the terminal for the computer is even more unusual. Interactive voice response (IVR) permits a computer to send digitized voice files over standard telephone lines for the patient to hear. Patients then respond to questions by pressing keys on their touch-tone telephone. Patients also record their initial goals for treatment and subsequently refine them as personalized goals in their own voice and hear these personalized goals each time before initiating an E & RP session. They may also leave a personal message for a behavior therapist asking for help on a particular aspect of behavior therapy and receiving the therapist's recorded response within a few days. Assessments of status at baseline and along the course of treatment are also obtained by IVR, and patients are given feedback regarding their improvement both by telephone and in weekly reports that are mailed to them. Altogether, BT STEPS has 12 separate calls, several of which are used repeatedly. Branching among the more than 1000 voice files is determined by patient responses during current and previous calls.

Steps 1 through 4 of BT STEPS constitute behavioral assessment. In Step 1 patients learn about the program. In Step 2 they identify their major rituals and their costs in time and money. Step 3 begins the process of individualizing treatment, which is essential for effective behavior therapy, by identifying personal triggers of obsessions, rituals, and discomfort from a list of more than 170 common triggers. Also in Step 3, general goals for addressing those triggers via exposure in vivo and ritual prevention are set. Step 4 assesses whether the patient involves relatives and friends in their rituals and assesses the possibility of engaging them as cotherapists.

Steps 5 through 8 of BT STEPS constitute the actual detailed treatment plan. In Step 5 patients personalize their general E & RP goals and carry out their first E & RP session. They are also instructed in the use of a daily diary and are provided with coping tactics to help them deal with distress during E & RP sessions. Immediately after Step 5, they fine-tune their technique in Step 6 so that subsequent E & RP sessions will be even more effective. Step 7 is then used repeatedly throughout the remainder of treatment, with telephone call 7A occurring

before an E & RP session to identify the specific goal on which the patient will work. Telephone call 7B is a "help" call patients may activate in the midst of an E & RP session if discomfort becomes too great. Telephone call 7C occurs immediately after the E & RP session so that the patient can report level of discomfort, session duration, and other relative treatment variables to guide BT STEPS in modifying treatment. Step 8, "troubleshooting," is presented if patients are not making satisfactory progress and at certain intervals to ensure that patients are aware of factors that may interfere with behavior therapy. Step 9, "maintaining gains," emphasizes relapse prevention.

Two preliminary trials of BT STEPS involved 65 patients in three sites (Greist JH, Marks I, Baer L. Unpublished data). All patients contacted a computer in Madison, Wisconsin, by dialing toll-free numbers from Wisconsin, Massachusetts, or England. In both trials, patients who completed two or more sessions of E & RP improved, with the mean improvement across both trials as great as that found with potent SRIs. Patients who completed two or more E & RP sessions had a mean telephone contact time of 7 hours 58 minutes and a mean call time of 8 minutes.

Twenty-four of the first 40 patients involved in BT STEPS gave evaluations of their experience. None who responded found the interaction with the telephone either hard or very hard, and none found the calls either extremely short or extremely long. Forty-six percent preferred having this kind of treatment with a talking computer over the phone, while 33% would have preferred a clinician, 17% said that it made no difference, and 4% would have preferred a paper-and-pencil medium. Interestingly, none indicated a preference for a desktop computer program. Seventy-one percent of respondents indicated that BT STEPS had positively affected their quality of life. A multicenter controlled trial is now underway to evaluate BT STEPS versus clinician-administered behavior therapy.

## DISCUSSION

Behavior therapy involving E & RP has been proven effective as treatment for OCD. However, it remains inaccessible to most people with OCD because of economic and geographic barriers as well as a lack of expert practitioners of E & RP therapy.

BT STEPS is a computer program developed to assist clinicians in providing behavior therapy for their OCD patients. Preliminary evaluations indicate that BT STEPS is effective in direct proportion to the amount of E & RP patients carry out. Patients generally liked their interactions with the computer program, and the large majority of those who completed two or more sessions of E & RP rated themselves either much or very much improved.

It is hoped that BT STEPS will make behavior therapy widely available to patients who cannot otherwise obtain it. If BT STEPS proves effective in assisting behavior ther-

apy for a substantial proportion of OCD patients, the few practicing behavior therapists can be freed to work more intensively with those OCD patients who continue to need personal clinician guidance.

*Drug names:* clomipramine (Anafranil), fluoxetine (Prozac), fluvoxamine (Luvox), paroxetine (Paxil), sertraline (Zoloft).

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