Eye Movement Desensitization and Reprocessing (EMDR) as Treatment for Post-Traumatic Stress Disorder (PTSD)

Patrick A. Boudewyns
Leon A. Hyer
Augusta VA Medical Center and Medical College of Georgia, USA

Eye Movement Desensitization and Reprocessing is a new and controversial cognitive–behavioural treatment technique that combines cognitive processing and exposure methodology to treat conditioned emotional responding and other trauma-related symptoms. EMDR is controversial in part due to initial excessive claims by its originator, Francine Shapiro, and also because of what many believe to be Shapiro's proprietary emphasis in controlling who may use the technique with patients. In this paper our aim is to take an objective look at the process and effectiveness of this technique. The purpose here is to (1) offer a brief objective review of the outcome literature to date on EMDR; (2) present a short summary of results of an 'early look' at an ongoing controlled study of this method that we are presently conducting; (3) speculate on the merits of this approach based on both scientific and clinical experience with EMDR and (4) offer a brief description of the evolved process of EMDR along with a commentary on that process.

INTRODUCTION

We are a long way from identifying a psychological treatment of choice for chronic post-traumatic stress disorder (PTSD). However, based on acceptable research designs, several psychological treatment techniques have been shown to be helpful in reducing at least some of the many symptoms of PTSD for specific populations. These include systematic desensitization and cognitive–behavioural therapy (Frank *et al.*, 1988; Resick and Schnicke, 1992), exposure therapy (Kilpatrick *et al.*, 1982; Keane *et al.*, 1989; Cooper and Clum, 1989;

Boudewyns and Hyer, 1990; Foa *et al.*, 1991), and support and skills training (Resick *et al.*, 1988). In a recent summary recommendation of 'working treatments' with combat survivors in the United States Department of Veterans Affairs, Smyth (1995) endorsed the activation of the target memory with the autonomic nervous system (exposure) in moderate range until a reduction of tension occurs (desensitization), and the concomitant use of the assimilation process (cognitions).

Eye movement desensitization and reprocessing (EMDR) (Shapiro, 1995) is a new method of therapy that employs both exposure (i.e. 'desensitization') and cognitive processing of the traumatic memories. An unusual aspect of the technique is that it also involves having the patient engage in therapist-directed, saccadic eye movements during the treatment procedure. Over the past 6 years the role of the eye movements has altered from one that was crucial (Shapiro, 1989b) to one where they are

Addressee for correspondence: Patrick A. Boudewyns, PhD, Chief, Psychology Service (116BU), VA Medical Center, One Freedom Way, Augusta GA 30904, USA.

epiphenomenal (Shapiro, 1995). Recent studies would appear to indicate that replacing eye movements with finger tapping (Pitman et al., 1993, 1995) or eliminating them altogether (Boudewyns et al., 1994, 1995) had little effect on outcome. Interestingly too, both patients and therapists tend to prefer EMDR over a control technique that included all aspects of EMDR except the eye movements (Boudewyns et al., 1994). As a treatment for anxiety disorders, one advantage of EMDR may be that it does not seek to increase exposure beyond what the patient volunteers and therefore does not engender as high a level of initial anxiety during the treatment as do direct exposure methods (Lipke, 1995; Boudewyns et al., 1995). In this regard the eye movements may act as buffers or inhibiting stimuli that break up the exposure process into trials or 'doses', making the exposure more tolerable to the patient (and perhaps to the therapist also).

We realize that EMDR is controversial (e.g. Herbert and Meuser, 1992; Lohr et al., 1992; Page and Crino, 1993; Acierno et al., 1994) in part due to initial excessive claims (Shapiro, 1989b) and also because of what many believe to be Shapiro's proprietary emphasis in controlling who may use the technique with patients. We do not wish to join this debate. The purpose of this paper is to (1) offer a brief review of the outcome literature to date on EMDR; (2) present a short summary of results of an 'early look' at an ongoing controlled study of this method that we are presently conducting; (3) speculate on the merits of this approach based on both our scientific and clinical experience with EMDR and (4) end with a brief description of the evolved process of EMDR along with a commentary on that process.

EMDR AS TREATMENT FOR PTSD

In her recent book Shapiro (1995) espouses an Accelerated Information Processing model for the theory of EMDR, emphasizing the importance of 'movement' of information and that EMDR acts at the physiological level and links up neural networks. To date however, only two case level studies offer even vague support for the theory. Wilson and Covi (1991) noted a distinctive autonomic arousal pattern during EMDR, and Nicosia (1994) found evidence of a slow brain wave synchronization of the cortical hemispheres during EMDR.

As is usually the case with new psychological treatment techniques, the efficacy of EMDR was first reported via positive case studies (e.g. Marquis, 1991; Kleinknecht and Morgan, 1992; Lipke and Botkin, 1992; Forbes et al., 1994; Montgomery and Ayllon, 1994), while the results of later controlled evaluations were more equivocal. Eight controlled studies involving comparison groups seem to lend support to EMDR (Shapiro, 1989a; Sanderson and Carpenter, 1992; Hekmat et al., 1993; Levin et al., 1994; Renfrey and Spates, 1994; Vaughn et al., 1994; Wilson et al., 1994, 1995; Silver et al., 1995) and four have more mixed results (Boudewyns et al., 1993, 1994; Pitman et al., 1993; Jensen, 1994).

EMDR studies have suffered from design flaws, especially poor sample definition, unreliable measures, non-blinded evaluations, and a lack of quality control of the treatments. The first of these controlled studies (Shapiro, 1989a) was especially noteworthy for problems. Shapiro assigned 22 combat veterans and sexual assault victims to at least one session of EMDR, with half receiving a delayed treatment and then crossed-over. Shapiro found changes in as little as one session on measures assessing anxiety, validation of positive self statement, level of distress of traumatic incident, and presenting complaints at 1 and 3 months post-therapy. This study was limited by a small sample size, outcome measures without standardization, a cross-over design not allowing for follow-up, and the fact that therapy measures were administered by the author, the originator of the technique unblinded to treatment.

Regarding the other more positive studies, problems were noted in each. Levin et al. (1994) treated acute traumatized clients and used only one valid scale, the Impact of Events, and had poor sample definition. In this study, EMDR outperformed supportive therapy and no treatment controls. Effects were maintained at follow-up. Hekmat et al. (1993), Renfrey and Spates (1994) and Wilson et al. (1995) performed component analyses of EMDR (using various methods in lieu of eye movements). Hekmat et al. (1993) used 30 pain subjects and compared EMDR with EMDR/music and a control, and showed that the two treatment groups alleviated pain relative to the control; Renfrey and Spates (1994) found change in all treatment groups (EMDR and analogues) on an interviewer measure of PTSD and on psychophysiological measures; Wilson et al. (1994) found that eye movements were superior to hand taps and exposure only on the Subjective Units of Distress Scale (SUDS) and on psychophysiological measures. Improvements were maintained for up to 12 months. All three studies had small samples (30, 23, and 18 respectively) resulting in small cell sizes.

Sanderson and Carpenter (1992) treated mostly simple phobics ($n = 58$) in a cross-over design,

comparing a non-standard EMDR treatment with a form of exposure therapy, and showed that both forms of therapy reduced SUDS levels compared to controls. The Silver et al. (1995) study was a retrospective add-on study, lacking randomization. EMDR outperformed milieu and two other add-on treatments with Vietnam veterans. Some cell sizes were also small. Vaughan et al. (1994) evaluated 36 PTSD subjects in three treatments (EMDR, imaginal exposure, and applied muscle relaxation) and showed that EMDR, imaginal exposure and relaxation all responded better than a no-treatment group. EMDR subjects used fewer sessions and outperformed the other groups on intrusive symptoms. Here again EMDR subjects did better than the controls, but were not superior to other treatment groups. As with other studies, this study had little or no checks on quality control of the treatments.

Wilson et al.'s study (1994) is the most positive controlled outcome study of EMDR to date. In that study 80 subjects were randomly assigned to one of two equal groups. Both groups received a total of 4 h of EMDR. One group, however, was a delayed treatment condition that was tested before and after a 90-day waiting period. Compared to the waiting period group, subjects receiving EMDR showed significant decreases in presenting complaints and in anxiety as measured by the SCL-90, the Impact of Events Scale, and SUDS. The delayed treatment condition also improved after treatment and gains of the initial treatment group were maintained at a 90-day follow-up. This study had a follow-up, adequate sample size, a blind reviewer, and reliable measures. Unfortunately, no quality control was noted and no data were given on the diagnosis of the sample.

The studies with mixed results also have weaknesses. In a small pilot study Boudewyns et al. (1993) compared two treatments of EMDR to an exposure control group (eyes closed) and a baseline control group (milieu treatment on an inpatient unit). EMDR-treated subjects showed significant reductions in SUDS ratings compared to both control conditions. No significant differences between the three groups at post-therapy on other psychological and psychophysiological measures were noted. Besides the small sample size ($n = 20$) and limited number of sessions, this study was also limited by the fact that there was no follow-up.

Two other studies used a veteran population in the assessment of EMDR. In a cross-over trial, Pitman et al. (1993) randomized 17 Vietnam combat veterans with PTSD into an EMDR or an 'eyes-fixed' exposure therapy condition (six sessions). Results found that the two treatments were equally successful at reducing intrusive and avoidant symptoms of PTSD. This study used a small sample size, had no follow-up and used no other controls. Psychophysiological outcome measures were taken in this study, but were not reported until recently. In that belated report Pitman et al. (1995) found that both treatments were equally effective and that positive changes found were about the same as that found in other studies using direct exposure as treatment for PTSD.

Jensen (1994) compared a group of EMDR-treated combat veteran PTSD patients with a non-treated control group. Results found that SUDS levels were reduced significantly for the EMDR group compared to controls but that none of his other outcome measures, including the Structured Interview for PTSD, a Goal Attainment Scaling measure (Kiresuk, 1979) and the Mississippi Scale (Keane et al., 1988), showed significant change. Unfortunately, this study of chronic subjects used psychology interns as therapists, offered only two EMDR sessions, had small cell sizes, had no follow-up data, and had no control for treatment being given outside the study.

In summary, previous studies suggest that EMDR holds promise as a treatment for trauma victims, and may be at least as effective as other forms of exposure. However, all outcome studies to date must be considered preliminary due to the many limitations noted above. If the standard is that EMDR must improve on extant treatments, then at present this method is competitive but not superior.

In the past we have argued that exposure is the important element of treatment of trauma survivors and, more recently, that EMDR applies this treatment component in what appears to be a user-friendly manner (Boudewyns et al., 1995). In addition, it has been argued that the core of trauma processing involves both the reexperiencing of the trauma and the reprocessing of a newly assembled set of perceptions, emotions and reattributions from the past (Smyth, 1995). Thus, the EMDR method seems not only to use exposure effectively, but also applies these other accepted principles of therapy as well. Also, EMDR may be more effective with less chronic patients (e.g. Levin et al., 1994; Wilson et al., 1994) and may involve less time than other methods (e.g. Renfrey and Spates, 1994; Vaughn et al., 1994).

A TREATMENT OUTCOME STUDY OF EMDR FOR COMBAT-RELATED PTSD

Our present 3-year ongoing study of EMDR with chronic, severe combat-related PTSD addresses

many of the limitations noted above. A brief summary of an early look at selected results of this study is presented below (see also Boudewyns *et al.* (1994, 1995) for other progress reports on this study). This study was designed to meet concerns regarding randomization, sample size, blind evaluators, reliable measures, and treatment quality control. In this study EMDR is being compared to an analogue of itself, exposure without eye movements, as well as a baseline control group that received group therapy (as did all conditions).

METHOD

Subjects

For this early look 61 subjects were assessed. Forty-six (46) of these subjects were inpatients in one of our Specialized Inpatient PTSD Treatment Units (SIPUs) at Augusta Georgia (USA). The remaining 15 were in our outpatient treatment programme and were distributed equally across the three treatment conditions. The original design called for evaluating subjects prior to therapy, immediately following the completion of therapy and at two follow-up times, 6 months and 1 year.

All subjects were weaned off psychotropic medications for 2 weeks plus four half-lives of the medication being used prior to being admitted to the programme. Seventy-seven per cent (77%) were either receiving disability pensions or were seeking disability pensions at the time of admissions. The population from which this sample was drawn is considered to be chronic, multiply disordered patients, most of whom are totally dependent on the Department of Veterans Affairs for financial and health purposes.

Subjects were diagnosed with PTSD according to the Structured Clinical Interview for DSM-III-R (SCID) and a careful history. Patients with a co-existing Axis I diagnosis of an Organic Mental Disorder, Schizophrenia, or with a diagnosis in the category 'Psychotic Disorders not Elsewhere Classified' in DSM-III-R were excluded. In addition, patients who carry an Axis II diagnosis of Antisocial Personality Disorder were excluded.

Procedure

There were three randomly assigned treatment groups, an EMDR group ($n = 21$), an exposure control (EC) ($n = 18$) group, and a second control group (C) ($n = 22$). All subjects in each of the groups received eight sessions of the standard group treatment programme offered by either the outpatient programme or the SIPU. The EMDR group received between five and seven sessions of EMDR. The EC group received the same number of sessions as did the EMDR group. The difference between the EC and EMDR groups was that the exposure subjects did not engage in eye movements during individual therapy, but rather kept their eyes closed and engaged in continued imaginal exposure during that time. Otherwise there were no differences between the groups and the EC condition could be described as EMDR without the eye movement. This was done to control for the effects of therapeutic exposure, a treatment condition known to be effective with PTSD. Otherwise the treatment for this condition was exactly the same as that for the EMDR group and could be considered EMDR without the eye movements. Subjects in group C received eight sessions of the standard therapy only. Although subjects in group C received no exposure therapy they did, at times, discuss traumatic material. Two rapport sessions were provided prior to the treatment in which a standard rationale of trauma memories was presented to the subjects by the therapists. All treatment took place within 6 weeks. Finally, no differences existed among the groups on standard background measures including age, race, marital status, and amount of combat exposure.

Therapists

All therapists ($n = 10$) were licensed psychologists well trained in EMDR by trainers approved by Shapiro who were randomly assigned to both individual therapy conditions. The therapists providing the group therapy to all subjects did not provide EMDR or EC treatments. All therapy sessions were video-taped, and at least two tapes were reviewed by the EMDR experts and scored for conformity to the technique. Feedback was then provided to the therapist on their specific technique.

Measures

All measures were taken by a clinician blind to treatment condition. The intake measures included the SCID, the War Stress Inventory (Fontana *et al.*, 1990), and the Combat Exposure Scale, a brief scale rating the amount of combat exposure. The complete SCID was given to rule out diagnoses, as well as any comorbid diagnoses. Also, the SCID-II module, Antisocial section, was used to rule out this personality disorder.

Outcome measures were taken at the following intervals: prior to therapy, immediately following therapy and at two follow-ups (6 months and 1 year). No follow-up data are presented in this early examination of the data because of small cell sizes at this time. Outcome measures included (1) the Clinician Administered PTSD Scale (CAPS-1) (Blake et al., 1990), where changes in two categories of PTSD symptoms were analysed for this early look, 'all symptoms' and 'reexperiencing', (2) the SUDS, (3) the Impact of Events (IOE) scale (both intrusions and avoidance subscales), and (4) the Profile of Moods scale (POMS) (anxiety subscale only).

Psychophysiological responses were also used as outcomes. These included frontalis EMG, skin conductance, heart rate, and blood pressure. Only heart rate is presented in the analyses for this early look. Heart rate in response to facsimiles of combat has been shown in several studies to be a valid predictor of combat-related PTSD (Blanchard et al., 1986; Pitman et al., 1987, 1993; Kolb and Keane, 1988). Heart rate is also less likely to be influenced by non-clinical factors such as disability seeking, and therefore may be the most valid measure available for this population.

The psychophysiological measures were taken in response to a tape-recorded script of the subject's most disturbing trauma memory. Prior to therapy, subjects were asked to describe the traumatic event for recording on audio-tape. From this information a technician, who was blind to the treatment condition, recorded a 1-min 'script' describing the traumatic event used as stimuli for the psychophysiological procedure. Two scripts of the same event designed to recall the traumatic event to be targeted for treatment were played back to subjects while psychophysiological responding was recorded. The psychophysiological measures were taken approximately 1 week prior to therapy and at 1 week after therapy ended.

The psychophysiological data were recorded using a technology and content very similar to that developed for a large VA Cooperative Study aimed at determining the validity of using psychophysiological measures to determine combat-related PTSD (Kolb and Keane, 1988). This procedure involves the monitoring of the subject's physiology while viewing combat videos of standard trauma scenes and later hearing the tape-recorded scripts depicting individualized combat scenes. These scenes are interspersed with neutral scenes, baselines, and other combat and non-combat anxiety-eliciting scenes and tasks such as doing arithmetic problems. The entire process takes about 2 h.

The primary statistical analysis used for the psychological measures was a 3 (treatment groups) by 2 (pre–post repeated across time) two-factor ANOVA. A covariance analysis of the three groups with initial differences covaried out on the pre scores was used for heart rate data. The particular measures used in this early look were selected for their potential for change in this chronic sample over a short period of time. Based on these criteria, all of these measures were selected for inclusion in this early look prior to observing or analysing any of these data.

RESULTS

In general patients receiving standard therapy (group C) alone evidenced an increase in heart rate after therapy compared to pre-therapy while the patients receiving either EMDR or EC evidenced a decrease in heart rate pre- to post-therapy. For example, when viewing the combat tape of standard war stressors, subjects in group C showed an increase in mean beats per minute (bpm) from 74.8 bpm pre-therapy to 78.2 bpm at post-therapy while the EMDR group decreased from 76.0 to 74.5 and the EC group went from a mean of 73.2 to 69.0. Although there was no significant difference between the three groups in bpm prior to therapy there was still considerable variance, so an analysis of covariance (ANCOVA) was used to test these differences after covarying out the pre-therapy differences. For this analysis $F(2,58) = 4.07$; $p < 0.022$, indicating that this configuration of differences was statistically significant. A Tukey post hoc test for differences at post-therapy only also supported these findings by indicating that there was no significant difference between the EMDR and the EC groups $p < 0.987$ while both EMDR and EC were both significantly different from C $p < 0.048$ and $p < 0.042$ respectively. Perhaps the one most cogent comparison of heart rate change was the subject's response to their individualized trauma script that was encountered first in the session (a tape-recording describing their own most traumatic memory). For this comparison the EMDR group evidenced a mean drop in heart rate from 74.5 bpm pre-therapy to 70.8 post-therapy and the EC subjects had a mean decrease from 68.0 bpm to 65.5 bpm while the C group had a mean increase from 72.0 to 75.1 bpm. Again there is, unfortunately, what appears to be non-significant variance pre-therapy in these randomly assigned groups due primarily to the low mean heart rate of the EC

group. We plan a more thorough look at the reason for this variance when the final data set is analysed. Again an ANCOVA also found this configuration statistically significant, $F(2,58) = 3.71$; $p < 0.031$. To a lesser extent than for the generic combat video, the conservative Tukey *post hoc* test also supported this configuration for the post means finding only EMDR different from C at $p < 0.065$ and EC different from C at $p < 0.054$ with no statistically significant difference between EMDR and EC for this test, $p < 0.982$.

For the SUDS both EMDR and EC subjects dropped significantly from pre- to post-therapy $F(1,38) = 36.67$; $p < 0.0001$. The EMDR SUDS levels dropped from a pre-therapy high mean of 6.68 to a post-therapy low mean of 3.09 while EC means went from 7.9 to 4.38. These were essentially parallel drops with no pre-therapy differences and no significant interaction between the groups.

For the POMs (anxiety scale) both EMDR and EC dropped significantly (EMDR *M*: pre = 21.43; post = 15.33; EC *M*: pre = 31.39; post = 22.67). *Post hoc* tests revealed no significant difference between these two. Group C subjects increased in POMs anxiety pre- to post-therapy (*M* pre = 27.13; *M* post = 28.18) resulting in a significant interaction, $F(2,58) = 3.89$; $p < 0.026$.

The IOE did not show significant change, although the sample changes were all in the predicted direction. A problem with this analysis resulted from the fact that there was a significant overall difference between the groups for the Intrusion scale, $F(2,58) = 4.81$; $p < 0.01$, regardless of time (pre or post), that stemmed primarily from the fact that EMDR subjects had low pre-therapy scores ($M = 20.42$) compared to EC ($M = 23.83$). This may have been a chance occurrence as no other state measure showed these pre-therapy divergences.

For both the CAPS all symptoms category and reexperiencing category all three groups dropped significantly pre to post, $F(1,61) = 47.74$; $p < 0.0001$; $F(1,61) = 33.10$; $p < 0.0001$ respectively. For the 'all symptom' category the means were: pre EMDR = 75.23; pre EC = 85.60; pre C = 81.23; post EMDR = 50.09; post EC = 67.50; post C = 67.18. For the 'reexperiencing' category the means were: pre EMDR = 16.05; pre EC = 20.05; pre C = 18.27; post EMDR = 10.41; post EC = 15.45; post C = 14.23. This drop was both statistically and clinically significant and is important in that it indicates positive change in symptoms is possible in this otherwise chronic population. However, there were no significant interactions indicating that no one group outperformed the other with regard to

decrease in the frequency and/or intensity of symptoms as measured by the CAPS.

DISCUSSION

This early look at the results suggests that EMDR improves outcome over a standard treatment. However, as with an earlier similar study (Pitman *et al.*, 1993), this is also true of the EC condition that essentially involves EMDR methodology without the eye movements. As a result of treatment both conditions decreased on the SUDS, POMS and heart rate. Both treatments appear to reduce the conditioned emotional response associated to the trauma about equally when compared to a standard treatment programme for very chronic veterans with combat-related PTSD.

As referenced above, heart rate increase in response to combat trauma memories has been shown to be a valid predictor of PTSD in combat veterans. In the present study patients receiving group therapy alone evidenced an increase in heart rate after therapy while patients receiving either EMDR or EC showed a drop in heart rate pre- to post-therapy. Thus, patients who are given exposure therapy appear to reduce the conditioned emotional response to the trauma. We may also hypothesize that group C subjects may have become sensitized to the trauma scripts based on their pre-therapy experience with the tape-recorded scripts without additional direct therapeutic exposure to promote extinction of that conditioned emotional response. However there were no significant differences between the EMDR group and the EC group with regard to these comparisons.

In previous studies (Boudewyns *et al.*, 1994) it was reported that both the therapists and patients preferred the eye movement procedure over the more direct exposure procedure. Therefore, even if EMDR is only equally effective as DTE, it would likely be used more. This is significant because therapists tend not to use direct therapeutic exposure even when indicated (Boudewyns and Shipley, 1983; Fontana *et al.*, 1990). Non-dosed exposure may be perceived as emotionally difficult for both patient and therapist. Based on the above results and several past studies of exposure therapy used with PTSD reviewed above, it may be argued that exposure alone is the operative component and that therapy of trauma should maximize this. However, it should be recognized that the cognitive and processing aspects of EMDR as described by Shapiro (1995) involves the creative application of

CAPS:

	Pre	Post	Pre	Post	POMS	Pre	Post
EMDR	75.23	50.09	16.05	10.41		21.43	15.33
EC	85.60	67.50	20.05	15.45		31.39	22.67
C	81.23	67.18	18.27	14.23		27.13	28.18

many common tasks of traditional 'good' psychological treatment (whatever the merits of the eye movements). And this could also help explain the successful outcomes. As noted, Shapiro (1995) herself has relegated the eye movements to a secondary position in the treatment, noting that they can be duplicated by other means (e.g. taps, sounds). However these present data would suggest that no lateralizing stimuli are necessary to achieve positive outcome.

There are many unknowns here: the time spent on pure exposure, length of time of each session, use of cues only related to the target memory, use of ancillary treatments such as relaxation (used in various sessions), and whether exposure was used until a reduction in anxiety occurred. Unique patient characteristics that might impact positively or negatively on EMDR with combat veterans was also not addressed. This may be a special problem given that Litz et al. (1990) noted that many of the patients used in this study may be inappropriate for the use of exposure treatment. These include personality disorders, history of previous treatment failures, unresolved life crises, and poorer physical health. Compensation seeking also was not considered.

In addition to the unknowns, this study did not compare EMDR against standard other treatments including flooding (direct therapeutic evidence) or implosive therapy. But, this study is an advance over other studies in several ways noted in the Introduction. Most especially, it used reliable measures, controlled treatments, and a carefully measured sample.

THE PROCESS OF EMDR

In this final section we do two things that are intended to assist the reader in understanding this treatment method; provide a brief summary of the EMDR procedure and give our thoughts on the process of this approach. This latter is important as EMDR now involves many other therapy components. This technique, as it is now practiced, is much more than eye movements and more than pure exposure (Shapiro, 1995). In a short time EMDR has evolved into a sophisticated technique that blends exposure with a non-directive, free associative processing and other treatment components common to good 'traditional' therapy. We are struck by the fact also that Shapiro (1995) has nicely articulated this procedure in a cohesive text that can be used as a guide to understanding this process,

regardless of one's prejudices and theoretical orientation.

At this time the EMDR procedure has been reasonably standardized by Shapiro (1995). Initially the patient is told: 'What we will be doing is taking a physiology check. I need to know from you exactly what is going on, with as clear feedback as possible. Sometimes things will change and sometimes they won't. I may ask you · if the picture changes. Sometimes it will and sometimes it won't. I'll ask you how you feel from "0" to "10"—sometimes it will change and sometimes it won't. I may ask if something else comes up—sometimes it will and sometimes it won't. There are no "supposed to's" in this process. So just give as accurate feedback as you can as to what is happening, without judging whether it should be happening or not. Just let whatever happens, happen'.

In the procedure the patient is asked to focus on a traumatic memory—usually the most traumatic point. There is no need to even describe the trauma. Then the therapist queries for the salient negative and positive cognitions related to the target memory. Words that attribute negative connotations are common (e.g. 'helpless', 'out of control', 'sad', 'angry', 'shame'). The therapist asks for a rating on the believability of the positive cognition. Next, the therapist acquires the most notable feeling state from the patient. The patient is asked to concentrate on the memory, picture and attributional words and assign a rating using the SUDS (0–10). Last before the eye movement processing, the therapist obtains information on the body sensation associated with the target memory.

Now the trauma processing begins. The therapist instructs the patient to visualize the traumatic scene, recall the negative statement and feeling, concentrate on the physical sensations in the body, and move his/her eyes to the therapist's index finger. The finger (or some object) is moved rapidly and rhythmically back and forth across the line of vision from the extreme right to extreme left at a 12- to 14-inch distance from the client's face, two back-and-forth movements per second. The back-and-forth movement of the therapist's finger is repeated for approximately 30 s and will vary depending on the intensity and type of processing. After each set of these saccades, the therapist tells the patient to relax, to take a deep breath and then describe what went on. This process is repeated as the patient 'moves' the target information.

As the patient processes the target trauma, cognitions, feelings and sensations change. According to Shapiro, sooner or later patients reveal new

cognitions that begin to approximate the 'desired' attribution given as the 'preferred' cognition prior to beginning the desensitization procedure. When the SUDs level reaches '0' to '1', then the patient's desired cognition is retrieved (and rated) and 'installed'. At this point the patient is asked to focus on the picture along with the desired rating while more saccades are used. When a positive cognition is rated high and the SUDS is 0 or 1 the EMDR procedure is terminated.

Problems occur when the target memory is 'stuck' and patients cannot process the information. Under these circumstances the therapist becomes more active and applies both cognitive and experimental techniques to expose the problem, challenge the data, or experiment with feelings to obtain necessary movement in the treatment. If another memory or picture begins to interfere, then the whole procedure is repeated with the new material.

Commentary on the Process

Results of this study suggest one conclusion at least, that EMDR or its analogue improve outcome over a standard treatment. It cannot be determined if exposure alone is responsible for the change as other treatment elements were present, including paced-treatment, relaxation, and a host of EMDR-essential treatment components. In a strict exposure therapy the use of many of these techniques is considered contrary to theory. Previous information also found that therapists and patients prefer this procedure over the more direct exposure procedure.

Parsimony dictates that EMDR maximizes exposure of the conditioned emotional response associated to the trauma, and 'other' components of therapy necessary for change. Here we briefly highlight obvious features of these other therapy components. Five are noteworthy.

First, the EMDR procedure is a non-directive and phenomenological method. It is a dosed exposure that targets state-specific information related to the problem. In the EMDR procedure the patient is requested to just talk with self, to 'stay with that'. In fact, the patient is told that the therapist does not need to know the details of the trauma, just what is happening during the processing. Whatever the merits of this message, the patient is directing the process and creates his/her own healing atmosphere.

A second component of EMDR is its emphasis on movement of information. According to Shapiro (1995) the primary goal of EMDR is processing, the changing of the neural network (schemas).

According to EMDR theory, the person is always processing (even in conversation), and the task is to allow access to all 'nodes' of information. The therapist is to prevent avoidance or data that does not move, much as in traditional exposure procedures. But, given that the patient is directing the process, s/he does so in a more trusting atmosphere, previously labelled 'Desensitization Using Free Association', which was also found effective with veterans suffering from anxiety often related to combat trauma (Boudewyns and Wilson, 1972).

In this regard, Shapiro (1993) considers EMDR to be 'fast' processing. Therapists keep statements simple ('just notice') to foster any movement of information. In abreaction (the fastest type of movement), the EMDR technique requires that the eyes be kept moving so as to keep the processing going. Worked properly, new or associated information is accessed. The intent is to keep the patient processing in present time to allow for natural healing processes. Again, the therapist has only one rule in this process—to keep the process moving.

Third, EMDR requires a set procedure, a process in which the patient experiences the target and a metacommunication time in which the patient reflects on the process. This is what Rennie (1994) believed to be the best in storytelling in psychotherapy—the client mixing nonreflexive ('just doing' in the story, not aware of activity) and reflexive (intending and reflecting on the 'doing'). In psychodynamic phraseology, this is a way to strengthen the observing ego (reflexive self), the core component in the subjective experience (Rennie, 1994). Again, in the psychodynamic therapies this represents a refinement in the participant–observer dynamics, an interplay of an inner and outer dialogue. Interestingly, this is done in a dosed manner, a chunking of the problem into tolerable bits of data. The patient chunks information, a little bit at a time.

Fourth, whatever EMDR does, an important position is given to cognition. Sweet (1995) notes that EMDR is at base a cognitive therapy. This therapy highlights key features of cognitive therapy, both negative and positive anchoring cognitions. The patient is requested to identify a negative, self-referenced belief that is current and has affective resonance about the target event. In addition, the client is asked to identify positive cognitions that, if true, would remove the offensive influence of the target event. This cognition is brought back to the life of the therapy at various times and installed. Expectations are present too, that this will be an evolving cognition as therapy proceeds.

Cognition is important during directed processing, during the eye movements themselves, and during the metacommunication part of the procedure. Shapiro (1995) argues that a cognitive/affective shift results as information is processed. This entails a switch (in treatment) from more global and negative statements ('This was bad') to more specific and healthy ones ('I am okay as I am and did well here'). As sufficient information becomes processed, a cognitive/affective shift occurs and a better verbal approximation of the core scheme is realized.

One last component of EMDR is 'now' processing, using affect and sensations. When past and present co-mingle and create the on-line expressions necessary for restructuring, the vehicle of change is most often affect or sensations (Safran and Greenberg, 1991). Singer and Salovey (1993) believe that affect especially is the phenomenon that provides the ordering for multiple memories. As with cognition, the ability to access affect is critical to change (Safran and Greenberg, 1991). In EMDR affect is directly accessed to increase processing.

In EMDR sensations are called in to cement the experiential component. Sensations themselves do not lie, giving a 'true snapshot' of the situation (Guidano, 1991). For Shapiro (1995) sensations are the true governor of the change process. Both sensation and affect are placed centre stage in EMDR processing interventions. Both are most important when processing is stopped (no movement is present); the EMDR therapist utilizes affect or sensation to foster change.

In sum, we are of the opinion that EMDR could become an effective and useful psychotherapy technique, whatever the eventual merits and impact of eye movements. EMDR applies the active treatment ingredient of exposure in a patient-acceptable manner. In addition, EMDR appears to us to be in compliance with important tenets of psychotherapy. Only more comparative studies will bear its eventual efficacy.

REFERENCES

Acierno, R., Hersen, M., Van Hasselt, V. B., Tremont, G. and Meuser, K. T. (1994). Review of the validation and dissemination of Eye-movement Desensitization and Reprocessing: A scientific and ethical dilemma. *Clinical Psychology Review*, 14, 287–299.

Blake, D. D., Weathers, F., Nagy, L. M., Kaloupek, D. G., Klauminzer, G., Charney, D. S. and Keane, T. M. (1990). A clinician rating scale for assessing clinical and lifetime PTSD: The CAPS-1. *The Behavior Therapist*, 13, 187–188.

Blanchard, E. B., Kolb, L. C., Gerardi, R. J., Ryan, P. and Pallmeyer, T. P. (1986). Cardiac response to relevant stimuli as an adjunctive tool for diagnosing post-traumatic stress disorder in Vietnam veterans. *Behavior Therapy*, 17, 592–606.

Boudewyns, P. A. and Hyer, L. (1990). Physiological response to combat memories and preliminary treatment outcome in Vietnam veteran PTSD patients treated with direct therapeutic exposure. *Behavior Therapy*, 21, 63–87.

Boudewyns, P. A. and Shipley, R. H. (1983). *Flooding and Implosive Therapy: Direct Therapeutic Exposure in Clinical Practice*. New York: Plenum.

Boudewyns, P. A. and Wilson, A. E. (1972). Implosive therapy and desensitization therapy using free association in the treatment of inpatients. *Journal of Abnormal Psychology*, 79, 259–268.

Boudewyns, P. A., Hyer, L. A., Peralme, L., Touze, J. and Kiel, A. (1994, August). Eye Movement Desensitization and Reprocessing for combat-related PTSD: An early look. Poster session presented at the 102nd Convention of the American Psychological Association, Los Angeles, CA.

Boudewyns, P. A., Hyer, L., Peralme, L., Touze, J. and Kiel, A. (1995, May). Eye Movement Desensitization and Reprocessing for combat-related PTSD: An early look. Paper presented at the convention of the American Psychiatric Association, Miami, FL.

Boudewyns, P. A., Stwertka, S. A., Hyer, L., Albrecht, J. W. and Sperr, E. V. (1993). Eye movement desensitization for PTSD of combat: A treatment outcome pilot study. *The Behavior Therapist*, 16, 29–33.

Cooper, N. A. and Clum, G. A. (1989). Imaginal flooding as a supplementary treatment for PTSD in combat veterans: A controlled study. *Behavior Therapy*, 20, 381–391.

Foa, E. B., Rothbaum, B. O., Riggs, D. S. and Murdock, T. B. (1991). Treatment of posttraumatic stress disorder in rape victims: A comparison between cognitive–behavioral procedures and counseling. *Journal of Consulting and Clinical Psychology*, 59, 712–715.

Fontana, A., Rosenheck, R. and Spencer, H. (1990). *The Long Journey Home: The First Progress Report on the Department of Veterans Affairs PTSD Clinical Teams Program*. West Haven, Connecticut: Northeast Program Evaluation Center, Veterans Affairs Medical Center.

Forbes, D., Creamer, M. and Rycroft, P. (1994). Eye movement desensitization and reprocessing in post-traumatic stress disorder: A pilot study using assessment measures. *Journal of Behavioral Therapy and Experimental Psychiatry*, 25, 113–120.

Frank, E., Anderson, B., Stewart, B. D., Dancu, C., Hughes, C. and West, D. (1988). Efficacy of cognitive behavior therapy and systematic desensitization in the treatment of rape trauma. *Behavior Therapy*, 19, 403–420.

Guidano, V. F. (1991). Affective change events in a cognitive system approach. In J. Safran and L. Greenberg (Eds), *Emotion, Psychotherapy, & Change*. New York: Guilford Press, pp. 50–79.

Hekmat, J., Groth, S. and Rogers, D. (1993). Managing acute pain with eye movement and desensitization. Poster session presented at annual convention of the

Association for Advancement of Behavior Therapy, Atlanta, GA.

Herbert, J. D. and Meuser, K. T. (1992). Eye movement desensitization: A critique of the evidence. *Journal of Behavior Therapy and Experimental Psychiatry*, 23, 169–174.

Jensen, J. A. (1994). An investigation of Eye Movement Desensitization and Reprocessing (EMD/R) as a treatment for posttraumatic stress disorder (PTSD) symptoms of Vietnam combat veterans. *Behavior Therapy*, 25, 311–325.

Keane, T. M., Caddell, J. and Taylor, K. (1988). Mississippi Scale for Combat Related Post-Traumatic Stress Disorder. *Journal of Consulting and Clinical Psychology*, 56, 85–90.

Keane, T. M., Fairbank, E. E., Caddell, J. M. and Zimering, R. T. (1989). Implosive (flooding) therapy reduces symptoms of PTSD in Vietnam combat veterans. *Behavior Therapy*, 20, 245–260.

Kilpatrick, D. G., Veronen, L. J. and Resick, P. A. (1982). Psychological sequelae to rape: Assessment and treatment strategies. In D. M. Dolays and R. L. Meredith (Eds), *Behavioral Medicine: Assessment and Treatment Strategies*. New York: Plenum.

Kiresuk, T. J. (October 1979). Goal attainment scaling: The first decade. Paper presented at plenary session of the Evaluation Research Society. Minneapolis.

Kleinknecht, R. A. and Morgan, M. P. (1992). Treatment of posttraumatic stress disorder with eye movement desensitization and reprocessing. *Behavior Therapy and Experimental Psychiatry*, 23, 43–49.

Kolb, L. C. and Keane, T. (1988). Cooperative Studies Program No. 334, *Psychophysiological study of chronic posttraumatic stress disorder*. Washington, DC: Veterans Administrtion.

Levin, C., Grainger, R., Allen-Byrd, L. and Fulcher, G. (August, 1994). Efficacy of eye movement desensitization and reprocessing for survivors of Hurricane Andrew: A comparative study. Paper presented at the 102 annual meting of the American Psychological Association, Los Angeles, CA.

Lipke, H. (1995). EMDR Clinician Survey. In F. Shapiro (Ed), *Eye Movement Desensitization and Reprocessing*. New York: Guilford Press, pp. 376–386.

Lipke, H. and Botkin, A. (1992). Case studies of eye movement desensitization and reprocessing with chronic post-traumatic stress disorder. *Psychotherapy*, 29, 591–595.

Litz, B., Blake, D., Geradi, R. and Keane, T. (1990). Decision making guideline for the use of direct therapeutic exposure in the treatment of posttraumatic stress disorder. *The Behavior Therapist*, 13, 91–93.

Lohr, J. M., Kleinknecht, R. A., Conley, A. T., Cerro, S. D., Schmidt, J. and Sonntag, M. (1992). A methodological critique of the current status of eye movement desensitization. *Journal of Behavior Therapy and Experimental Psychiatry*, 23, 159–167.

Marquis, J. N. (1991). A report on seventy-eight cases treated by eye movement desensitization. *Journal of Behavior Therapy and Experimental Psychiatry*, 22, 187–192.

Montgomery, R. W. and Ayllon, T. (1994). Eye movement desensitization across images: A single case design. *Journal of Behavior Therapy and Experimental Psychiatry*, 25(1), 23–28.

Nicosia, G. (1994, March). A mechanism for dissociation suggested by the quantitative analysis of electroencephalography. Paper presented at the International EMDR Annual Conference, Sunnyvale, CA.

Page, A. C. and Crino, R. C. (1993). Eye-movement desensitization: A simple treatment for post-traumatic stress disorder. *Australian and New Zealand Journal of Psychiatry*, 27, 288–293.

Pitman, R., Altman, B., Longue, R. E., Poise, R. E. and Lasko, N. B. (1995, May). Eye movement desensitization and reprocessing: efficacy for trauma victims. Paper presented at the annual meeting of the American Psychiatric Association, Miami, FL.

Pitman, R. K., Orr, S. P., Altman, B., Poise, R. E., Lasko, N. B. and Longue, R. E. (1993, May). A controlled study of eye movement desensitization/reprocessing (EMDR) treatment for posttraumatic stress disorder. Paper presented at the annual meeting of the American Psychiatric Association, Washington, DC.

Pitman, R. K., Orr, S. P., Forgue, D. F., deJong, J. B. and Claiborn, J. M. (1987). Psychophysiologic assessment of posttraumatic stress disorder imagery in Vietnam combat veterans. *Archives of General Psychiatry*, 44, 970–975.

Renfrey, G. and Spates, C. R. (1994). Eye movement desensitization and reprocessing: A partial dismantling procedure. *Journal of Behavior Therapy and Experimental Psychiatry*, 25, 231–239.

Rennie, D. (1994). Storytelling in psychotherapy: The client's subjective experience. *Psychotherapy*, 31, 234–244.

Resick, P. A. and Schnicke, M. K. (1992). Cognitive processing therapy for sexual assault victims. *Journal of Consulting and Clinical Psychology*, 60(5), 748–756.

Resick, P. A., Jordan, C. G., Girelli, S. A., Hutter, C. K. and Marhoefer-Dvorak, S. (1988). A comparative outcome study of behavioral group therapy for sexual assault victims. *Behavior Therapy*, 19, 385–401.

Safran, J. D. and Greenberg, L. S. (1991). *Emotion, Psychotherapy, & Change*. New York: Guilford Press.

Sanderson, A. and Carpenter, R. (1992). Eye movement desensitization versus image confrontation: A single session crossover study of 58 phobic subjects. *Journal of Behavior Therapy and Experimental Psychiatry*, 23, 269–275.

Shapiro, F. (1989a). Efficacy of the eye movement desensitization procedure in the treatment of traumatic memories. *Journal of Traumatic Stress*, 2, 199–223.

Shapiro, F. (1989b). Eye movement desensitization: A new treatment for post-traumatic stress disorder. *Journal of Behavior Therapy and Experimental Psychiatry*, 20, 211–217.

Shapiro, F. (1993). Eye movement desensitization and reprocessing (EMDR) in 1992. *Journal of Traumatic Stress*, 6, 417–421.

Shapiro, F. (1995). *Eye Movement Desensitization and Reprocessing*. New York: Guilford Press.

Silver, S. M., Brooks, A. and Obenchain, J. (1995). Treatment of Vietnam war veterans with PTSD: Comparative

Effects with Biofeedback and Relaxation Training. *Journal of Traumatic Stress*, 8, 337–342.

Singer, J. A. and Salovey, P. (1993). *The Remembered Self: Emotion and Memory in Personality*. New York: The Free Press, MacMillan, Inc.

Smyth, L. (1995). *Clinician's Manual for the Cognitive-Behavioral Treatment of Post Traumatic Stress Disorder*. Harve de Grace, MD: RTR Publishing Company. Relaxation Training.

Sweet, A. (1995). A theoretical perspective on the clinical use of EMDR. *The Behavior Therapist*, 18, 5–6.

Vaughn, K., Armstrong, M. F., Gold, R., O'Connor, N., Jenneke, W. and Tarrier, N. (1994). A trial of eye movement desensitization compared to image habituation training and applied muscle relaxation in post-traumatic stress disorder. *Journal of Behavior Therapy and Experimental Psychiatry*, 25, 283–291.

Wilson, D. and Covi, W. (1991). Autonomic Correlates of EMDR. *EMDR Network Newsletter*, 1(2), pp. 5, 6.

Wilson, D., Covi, W., Foster, S. and Silver, S. M. (1995). Eye movement desensitization and reprocessing and ANS correlates in the treatment of PTSD. Paper presented at the 148th annual meeting of the American Psychiatry Association, Miami, FL.

Wilson, S. A., Tinker, R. H. and Becker, L. A. (1994, August). Eye movement desensitization and reprocessing method in the treatment of traumatic memories. Paper presented at the 102nd Convention of the American Psychological Association, Los Angeles, CA.