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THE RECONSOLIDATION OF TRAUMATIC MEMORIES (RTM) PROTOCOL FOR PTSD: A TREATMENT THAT WORKS

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Abstract

PTSD treatments occupy five systemic levels—chemical, biological, neurophysiological, phenomenal, and cognitive. Pharmacological treatments bridge the chemical and biological levels. They are often imprecise in effect, and drugs imply brokenness. Direct neurophysiological manipulations include Stellate ganglion block, deep brain stimulation, transcranial magnetic stimulation, etc. These are new, often invasive, and sparsely attested. EMDR and RTM employ imaginal manipulation of internal images. Cognitive manipulations work with conscious responses. Cognitive interventions may expose patients to cultural issues, especially when performed in a group context. These include hyper-masculinized expectations, military culture, shame as self-blame, etc. EMDR, cognitive, and pharmacological approaches have shown equivalent efficacy. RTM modifies the imaginal structure of trauma memories, reimagining them as nonthreatening, past events. RTM may be employed without disclosure of trauma content. We hypothesize that changes to imaginal images directly and lastingly impact neurology via the reconsolidation updating mechanism. Four published RCTs of RTM will be presented with information about a fifth unpublished study of trainee results. All studies found effect sizes exceeding 0.08 SMDs with high patient satisfaction.

Keywords: *PTSD, RTM, reconsolidation of traumatic memories, reconsolidation, trainees.*

1. Interventions and levels of inquiry

The analytical mindset that drives modern science has often led us to look at mental disease from a Newtonian perspective; we fully expect to find a single cause for any observed effect. This has led us to simplistic and invasive approaches to treating mental and emotional disorders that do not adequately address the complex systemic interactions from which problems and blessings both arise.

From this perspective, the discovery of neurotransmitters and neuromodulators, the complex machinery of their expression, reabsorption, and their effects and interactions at any brain locus hold forth the possibility of a pharmacological intervention that might cure our ills. Pharmacological interventions bridge the interface between chemistry and biology, and in many cases, they are marvelously effective. However, drugs for PTSD only work about as well as psychological treatments (Bisson et al., 2013; Steenkamp, Litz, Hoge, & Marmar, 2015) and their effects largely end when they are no longer taken. Psychopharmacology often neglects the observation that neurotransmitters do not just drive behavior; they are also the products of behavior. When we adjust their levels, are we responding to input or output; intra-cellular levels, extra-cellular levels, or both? In the hands of most physicians, the approach is stochastic at best, hit and miss at worst. Beyond this chicken-egg problem, drugs are often expensive, and their actions are often nonspecific.

The siren call of cognitive neuroscience tempts us with the idea that finding the right set of neurons, the correct brain locus, perhaps even the right network would allow its direct modification and so rid us of mental disorders. Trans-Cranial Magnetic Stimulation (TCMS) uses strong magnetic fields to selectively activate or inactivate targeted brain loci (Belsher et al., 2021). Deep Brain Stimulation, involving the implantation of electrodes in the targeted brain centers, would hope to accomplish the same thing: direct control of neural responding (Lavano et al.,2018). Stellate Ganglion Block (Olmstead et al., 2019) seeks to end the expression of PTSD symptoms by modifying the tone of cortisol and adrenaline related to fear and anxiety as an adjunct to CBT. This general perspective has also led to the limited use of ablative surgery to control various conditions. Like the chemo-biological approach of psychopharmacology, there is a chicken and egg problem. Are the observed brain changes the cause of the problem or a manifestation of normal plasticity in aberrant circumstances? In general, these attempts to heal PTSD by directly manipulating the brain are expensive experimental approaches, requiring special equipment or invasive surgery.

Current psychotherapies for PTSD are often less effective than expectations allow. Frontline treatments include Prolonged Exposure (PE) in its various forms, Cognitive Processing Therapy (CPT), and Eye Movement Desensitization and Reprocessing (EMDR; VA, 2014). Two of these (PE & CPT) operate at the cognitive-behavioral level. All three have equivalent efficacy in reducing symptom severity scores, with pharmacological interventions similarly effective (Bisson et al., 2013; Goetter et al., 2015; Steenkamp, Litz, Hoge, & Marmar, 2015). None of them has been fully effective in treating PTSD. (Kitchiner et al., 2019; Steenkamp et al., 2015). Although often effective for treating mild or moderate PTSD, most studies report between 60% and 72% of participants in these treatment regimens retain the diagnosis after treatment, especially in combat-related trauma (Steenkamp et al., 2015).

Cognitive-behavioral interventions often rely upon verbal procedures seeking to understand and reprocess the fear memory on a conscious level. Others, depending upon Pavlovian extinction paradigms, establish blocking memories. These memories are often fragile and susceptible to relapse as the underlying trauma image re-emerges through the hallmark patterns of extinction decay—spontaneous recovery, contextual renewal, reinstatement, and rapid reacquisition (Bouton & Moody, 2004). One problem many cognitive approaches face is a failure to appreciate the hierarchical nature of neural structures and their multiple levels of integration (Buzsáki, 2010) This failure leads to efforts to change the more fundamental affective, subcortical responses from the cognitive level of language. Arntz (2020) observes that cognitive scientists would do well to move their level of analysis to the imaginal level as images are more fundamental to the processes of human experience than words. He makes the important point that images drive emotions, and shape their expression at the cognitive level.

2. The RTM Protocol

The Protocol is a fairly straightforward intervention with multiple opportunities to individualize its application. The basic steps of the RTM protocol are as follows:

Table 1. Treatment outline: Reconsolidation of Traumatic Memories.

1. The client is asked to briefly recount the target trauma. 2. At any display of autonomic arousal, the narrative is stopped and the client reorient to the present. 3. Elicit SUDS (Subjective Units of Distress) rating. 4. The clinician aids the client in choosing a recognizable but neutral name for the event. 5. The clinician assists the client in choosing “bookends:” a time before they knew the event would occur, and another when they knew that the event was over and that they had survived. 6. The client creates an imaginal movie theater in which the pre-trauma bookend is on screen in black and white. 7. As if from above and behind the client watches their own responses as a black and white movie of the target trauma plays from bookend to bookend. The movie is repeated and structural alterations made until the client is comfortable. 8. The client steps into the last frame of the movie, turns on the sound, color, and dimensionality, and experiences the event backwards, as a fast rewind lasting 2 seconds or less. It begins with the post-trauma bookend and ends with the pre-trauma bookend. This is repeated until they are comfortable and show no perceptible sighs of autonomic arousal. 9. The clinician elicits the trauma narrative and probes for responses to stimuli that previously elicited a fast arising, autonomic response. If the response is significant, earlier steps of the process are repeated. 10. SUDS ratings are elicited. 11. When the client is free from emotions in recounting the event, or sufficiently comfortable (SUDS = 1 or 2), they are invited to proceed to the next phase of treatment. If SUDs ≥ 3, trending upward, the client should repeat the protocol beginning either with the rewind or the black and white movies. 12. The client is invited to design and imagine living through several alternate, non-traumatizing versions of the event, and rehearses these several times. 13. The client is again asked to relate the trauma, and their previous triggers are probed. 14. SUDS ratings are elicited. 15. When the trauma cannot be evoked, and the client can recount the event without significant autonomic arousal, the procedure is over.
Note: Gray, R., Budden-Potts, D., Schwall, R., Bourke, F. (2020). An Open-Label, Randomized Controlled Trial of the Reconsolidation of Traumatic Memories Protocol (RTM) in Military Women [Accepted Manuscript]. *Psychological Trauma: Theory, Research, Practice, and Policy*. https://doi.org/10.1037/tra0000986 and is used with permission. Modifications by the author.

3. Theoretical considerations

The Reconsolidation of traumatic memories protocol (RTM) is an intervention for PTSD focusing on the imaginal level of consciousness (Gray, 2022). It assumes the mind-body system operates as a complex system in accordance with Bertallanffyian General Systems Theory and later models (Capra & Luisi, 2017; Gray, Fidler, & Battista, 1982). Thus, changes in a currently dominant subsystem can change the nature of the whole. As trauma responses are often mediated by visual imagery, subjective visual images may be understood to drive PTSD symptoms (Arntz, 2020)

Depending on a hypothesized reconsolidative mechanism, RTM affects functioning at the cognitive and biophysical levels through its impact on the images that drive symptom expression. The impact of those images is determined by structural dimensions which create the feeling that these subjective images are important, or their impact immanent. The same perceptual dimensions draw attention to significant environmental stimuli via retinotopic feature maps in the midbrain (Knudsen, 2018; Veale, Hafed, & Yoshida, 2017; White et al., 2017). Salience, importance, is determined in part by the following perceptual dimensions in each of the major sensory systems (visual, auditory, and kinesthetic): intensity (brightness, volume, pressure), complexity (hue, timbre, texture), contrast (granularity, frequency contrast, textural disparity); foreground-background (all sensory systems), frequency (color, pitch, felt distinctions of type: emotions, temperature, hedonic impact; Gray 2022). When the structure of the image is changed, symptom expression is likewise changed.

Reconsolidation of long-term memories refers to the observation that when a long-term memory is briefly activated, new information relevant to that memory may be incorporated into its structure. Changes are fast and appear to be permanent. Unlike extinction, reconsolidation modifies the underlying memory (Lee, Nader & Schiller, 2017).

The hypothesized association between RTM and reconsolidation is derived from observed homologies between the two processes. Both require a brief exposure to the target stimulus to activate the target memory. After a brief pause, or following a distractor stimulus, new, relevant information is introduced. After one sleep period, the memory is tested and the changes are typically found to be fully consolidated. There are several boundary conditions that ensure that reconsolidation occurs as intended. These include 1) the brevity of the stimulus presentation: it must be long enough to activate the memory but not so long as to create an extinction memory. 2) There must be a mismatch between learned expectations and the new elements in the learning context. 3) Only information that is relevant to the target memory will be incorporated. 3) New learning must be presented within a window of labilization, lasting one or more hours (Forcato, Fernandez, & Pedreira, 2014; Gray 2022).

3.1. RTM at multiple systemic levels

RTM, through its targeting of the imagic processes that drive symptom expression, gains access to every level of systemic organization. At the level of physiology, we have observed the reduction of observable physiological symptoms of stress (tears, tensing, flushing, changes in breath rate, etc.). Lewine and colleagues, in an unpublished study (Lewine et al., nd) have identified a biomarker for PTSD: the persistence of high-frequency beta waves in the right temporal lobe. Chronic activation of that area has also been associated with PTSD by Engdahl and associates (Engdahl et al., 2010). In the Lewine study, patients treated with RTM showed significant symptom reductions, loss of diagnosis, and loss of right temporal lobe activation in the high beta range.

At the cognitive level, patients who complete the intervention, develop increasing verbal fluidity at each successive step in treatment. By the end of treatment, they are able to relate the entire trauma narrative, with full details, often with forgotten details re-emerging. We believe that 1) This integration is mediated by the lessened salience of the trauma memory, resulting in enhanced access to trauma-related details. 2) As a further result of that lessened intensity, RTM clients spontaneously integrate the previously avoided event into their life narrative in an act of personal redemption (Gray & Bourke, 2015; Gray et al., 2019; Gray et al., 2020; Gray, Davison & Bourke, 2021; Tylee et al., 2017;). By focusing upon the imaginal, RTM operates at the level of structure, not content. Taking advantage of the neurology that connects the structure of subjective images to the experienced affect, RTM can intervene at the level of neurology, using a simple, directive approach.

4. Studies of the RTM protocol

The RTM Protocol was evaluated in four randomized controlled trials (RCTs; Gray & Bourke, 2015; Tylee et al., 2017; Gray et al., 2019; Gray et al., 2020), using standard measures of symptom severity. These included the PTSD Symptom Scale-Interview version (PSS-I) and the Posttraumatic Stress Disorder Checklist-Military Version (PCL-M), administered at intake and two weeks post-treatment. The pilot study used PCL-M only (Gray & Bourke, 2015). Three studies investigated RTM with male veterans (Gray & Bourke, 2015; Tylee et al., 2017; Gray et al., 2019). The fourth (Gray et al., 2020), used the protocol to treat thirty service-related women, 21 of whom suffered from some degree of Military Sexual Trauma (MST). All studies obtained high effect sizes (SMDs > 2.0) and significant loss of diagnosis.

Among completers from the three replication studies, about 74% reported a loss of diagnosis using the most stringent criteria. When less conservative criteria were used (scoring below the clinical thresholds for military PTSD; PSS-I ≤ 20, PCL-M ≤ 45; while showing no fast autonomic responding and reporting a total loss of nightmares and flashbacks), loss of diagnosis was above 90% for all three studies. Positive results extended to one full year for the three replication studies (Gray et al., 2019; Tylee et al., 2017; Gray et al., 2020). In each study, successful completers spontaneously reappraised and reintegrated the previously traumatizing memories into a coherent life narrative.

Between 2018 and 2020, 18 licensed mental health professionals participated in certification trainings in the Reconsolidation of Traumatic Memories (RTM) protocol. After certification, participants collected and reported back anonymized data on clients treated with RTM, including pre-post PSSI-5 (n =74) or PCL-5 (n =11) statistics for each client. We hypothesized that trainee results would match or exceed those reported in published RTM studies; the protocol's utility would extend to more trauma types than previously reported; and that their results would validate the efficacy of the training.

Between 2018 and 2020, those clinicians treated 90 patients diagnosed with PTSD. Patients averaged slightly more than one trauma each and averaged about 3 sessions per trauma. Data collection beyond symptom severity scores was limited by the exigencies of the COVID-19 epidemic. 85 of the RTM patients completed treatment for at least one trauma. Pre- post- PSS-I-5 or PCL-5 results found that 80 (95%) scored below minimal diagnostic criteria for PTSD, exceeding previously reported success rates for the intervention. Trainees also extended the range of treated traumas beyond military contexts to include family violence, first responder trauma exposure, sexual abuse, school-related traumas, and traffic accidents (Gray et al 2021).

5. Conclusions

The RTM Protocol has now been shown to successfully treat PTSD in both military and civilian contexts. It has surpassed the efficacy of mainline treatments in the permanent resolution of PTSD and its symptoms. Trainee results extend the availability of RTM to civilian populations with both simple and complex trauma histories. We look forward to further evaluations of the protocol and its extended use among clinical populations.

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