

# Clinical, Empirical, and Theoretical Rationale for Selection of Accelerated Resolution Therapy for Treatment of Post-traumatic Stress Disorder in VA and DoD Facilities

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**ABSTRACT** Introduction: Post-traumatic stress disorder (PTSD) is a chronic, disabling psychiatric disorder prevalent among U.S. service members and veterans. First-line treatments for PTSD endorsed in the 2017 Veterans Affairs (VA)/Department of Defense (DoD) Clinical Practice Guideline for PTSD emphasize individual, manualized trauma-focused psychotherapies that have a primary component of exposure and/or cognitive restructuring. These include prolonged exposure (PE) therapy, cognitive processing therapy (CPT), eye movement desensitization and reprocessing (EMDR), and others. Accelerated resolution therapy (ART) is an emerging trauma-focused therapy not specifically referenced in the guideline, but one that is consistent with the recommendations and is derived directly from EMDR. One randomized clinical trial and multiple observational studies have suggested that ART can be delivered in an average of just four treatment sessions. This commentary reviews the clinical, empirical, and theoretical rationale for use of ART as a potential first-line PTSD treatment modality in VA and DoD facilities. Materials and Methods: The clinical protocol of ART is summarized into discrete procedural steps. The theoretical rationale as to how ART may help clients process traumatic memories and resolve symptoms of PTSD is also discussed, including how repeated sets of smooth pursuit horizontal eye movements may facilitate a relaxation response and assist with processing emotionally intrusive memories. Herein, we review primary treatment results from four published studies of ART, including mean symptom score reductions on the 17-item PCL (PTSD checklist) after treatment with ART, along with effect sizes and percentage of treatment responders. Finally, the ART protocol is compared directly against specific recommended elements of trauma-focused therapy described in the VA/DoD Clinical Practice Guideline. Results: The four published studies of ART reviewed ( $n = 291$ ) included adult civilians and service members/veterans; the mean age was  $42.3 \pm 12.3$  yr and 28.9% were female. Among 237 treatment completers (81.4% of the combined cohort), the mean number of ART sessions received was  $3.9 \pm 1.1$ . Across the four studies, mean treatment-related reductions in PCL scores ranged from  $15.6 \pm 13.2$  to  $25.6 \pm 11.3$ , with a pooled mean reduction on the PCL of  $20.6 \pm 15.0$ . Effect sizes were large and ranged from 1.18 to 2.26 ( $p \leq 0.0005$ ) across studies, with a pooled effect size of 1.38 (95% confidence interval: 1.20–1.56,  $p < 0.0001$ ). Using the clinical cutpoint of  $\geq 10$ -point reduction on the PCL instrument, clinically significant change (response) ranged from 63.8% to 100.0% across the four studies, with a pooled treatment response rate of 74.7%. Results were nominally attenuated when conservatively assuming no treatment response for non-completers. Conclusion: The ART protocol contains the core therapeutic elements and aligns closely with the current VA/DoD Clinical Practice Guideline. It has a plausible theoretical rationale and an evolving empirical research base that includes four studies with peer-reviewed publications, one of which was a randomized controlled trial. These features, along with the brevity of the treatment protocol, no requirement for narration, and high provider satisfaction rates, provide a rationale for the potential use of ART as a first-line PTSD treatment modality for active duty and veteran military personnel.

## INTRODUCTION

Post-traumatic stress disorder (PTSD) is a chronic, disabling psychiatric disorder characterized by exposure to actual or threatened death, serious injury, or sexual violence that results in persistent re-experiencing of details related to the trauma(s), avoiding stimuli that invoke thoughts, feelings and reminders of the trauma, negative alterations in cognitions and mood associated with the traumatic event(s), and heightened trauma-related arousal and reactivity.<sup>1</sup> The estimated prevalence of PTSD among

U.S. service members deployed to Iraq and/or Afghanistan ranges from 4% to 17% depending on study methodology, definitions employed, and level of combat intensity<sup>2–4</sup> and is 10% among Gulf War veterans who have experienced combat.<sup>5</sup> Approximately 11% of Vietnam War veterans have PTSD-related impaired functioning four decades after the war.<sup>6</sup> Untreated and/or inadequately treated PTSD is associated with a range of health-related debilitating comorbidities, including depression and substance abuse disorders,<sup>7</sup> impairments in social and occupational functioning and overall quality of life,<sup>8–10</sup> poorer perceived physical health and greater health care utilization for physical problems,<sup>11</sup> and lifetime suicide attempts.<sup>9</sup>

Effective treatment of PTSD among U.S. service members and veterans is of paramount national security and public health interest. To guide such treatment, the VA/DoD Clinical Practice Guideline and corresponding European National Institute for

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doi: 10.1093/milmed/usy027

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Health and Care Excellence (NICE) Guideline provide promulgated algorithms and recommendations based on expert review panels and consensus. As first-line treatment, the U.S.-based VA/DoD Clinical Practice Guideline specifically recommends individual, manualized trauma-focused psychotherapies that have a primary component of exposure and/or cognitive restructuring. Similarly, the NICE Guideline recommends trauma-focused psychological treatment that is provided on an individual outpatient basis.<sup>12–14</sup> Although the guidelines are not prescriptive to any specific individual trauma-focused psychotherapy, extensive efforts in the U.S. have centered on widespread training and delivery of prolonged exposure (PE) therapy and cognitive processing therapy (CPT) as first-line treatment modalities.<sup>15,16</sup> In Europe, trauma-focused cognitive behavioral therapy (CBT) and eye movement desensitization and reprocessing (EMDR) are commonly recommended.<sup>12</sup>

Given that PE, CPT, and EMDR are the most recognized and endorsed first-line treatment modalities for PTSD in the DoD and VA, it is both instructive and sobering that these modalities, while providing relief to many PTSD sufferers,<sup>17–20</sup> also have significant limitations. These include the typical requirement for sustained patient and provider engagement for approximately 8–12 manualized treatment sessions, which often make high emotional demands on patients.<sup>21</sup> Consequently, treatment dropout rates may approach 40% in controlled clinical trial settings<sup>21</sup> and are equal if not higher in routine clinical settings.<sup>22–25</sup> The current VA/DoD Clinical Practice Guideline does not endorse any single trauma-focused therapy; it indicates that the selected treatment modality should include a primary component of exposure and/or cognitive restructuring and recommends at least seven different manualized treatments that were considered to have sufficient evidence from randomized clinical trials.<sup>14</sup>

Accelerated resolution therapy (ART) is an emerging trauma-focused therapy that is consistent with the current VA/DoD Clinical Practice Guideline and is derived directly from EMDR. Initial research has suggested that it can be delivered in fewer treatment sessions (three to four) and has solid theoretical support for consideration as an effective treatment for symptoms of PTSD. Therefore, with the goal of arming behavioral health care providers with a range of effective treatment modalities to meet the specific needs of service members and veterans with PTSD, this commentary reviews the clinical, empirical, and theoretical rationale for use of ART in VA and DoD facilities.

## DESCRIPTION AND THEORETICAL BASIS OF ART

Several published reports have described the ART protocol in detail.<sup>26–28</sup> Therefore, in this commentary, the primary steps of delivering the protocol are only briefly described, along with associated theoretical rationale.

### Step 1 (Relaxation and Orientation)

At the initiation of an ART session, the patient is asked to identify a specific traumatic experience to be processed

and report any associated uncomfortable sensations they may be experiencing, such as nervousness and anxiety, along with the specific part(s) of the body where the sensations are present. The patient is then directed to focus specifically on (“notice”) the sensation(s) while simultaneously performing the dual task of horizontal smooth pursuit eye movements<sup>29</sup> by following the clinician’s hand, which is moving horizontally from side-to-side in close proximity to the patient’s face. The purpose of this activity is to induce a relaxation response. Sets of horizontal eye movements have been reported to elicit a relaxation response,<sup>30</sup> lower electrodermal arousal,<sup>31,32</sup> and enhance parasympathetic system activity.<sup>33</sup> In general, one traumatic event, known as a “scene” in ART, is processed within a single session.

### Step 2 (Desensitization Through Imaginal Exposure)

After establishing the scene to be processed and conducting a brief relaxation exercise, which is akin to the resourcing exercises used in EMDR, the patient is directed to start visualizing the traumatic event in their mind from the beginning, as if they were watching a movie, while simultaneously performing one set of horizontal eye movements (approximately 30 s). Their attention is then immediately directed toward noticing the somatic, emotional, and physiological responses associated with that segment of the scene (e.g., muscle tension, fear, and increased heart rate). Additional sets of eye movements are utilized until these sensations are diminished and the patient is comfortable returning to the scene for another single eye movement set. This entire process is repeated until the patient can successfully complete the scene from beginning to end in their mind. After completing this process, the patient is directed to repeat it a second time, that is, seeing the scene from beginning to end with somatic/emotional processing, as well as noticing if anything is different the second time through compared with the first time. Usually, desensitization is confirmed when the processing is moving more quickly and/or the patient feels more removed and in control. Step 2 desensitization is considered complete when the patient is able to imagine the traumatic event with an acceptable (e.g., low) level of physiological reactivity.

In addition to the relaxation effect that patients routinely experience, two additional theoretical effects of eye movements have been proposed. First, there is research that supports the notion that performing horizontal eye movements, particularly at fast speed, improves overall memory recall.<sup>34–39</sup> This enhanced recall may help to consolidate fragmented elements of trauma memories, some of which may have been previously repressed. Second, research indicates that performing two tasks simultaneously (i.e., re-experiencing the trauma and performing eye movements) taxes limited working memory capacity, which forces memory traces representing events, emotions, and sensations to compete for permanence.<sup>40</sup> Specifically, the vividness and emotional intensity of traumatic memories (as well as positive memories) may be overridden or “pushed out” by the more technical/declarative aspects of the memories when a patient performs horizontal eye movements, particularly at fast speed.<sup>36,41,42</sup> Mechanistically, a recent

dismantling study of eye movements in EMDR suggested that the most important component was not necessarily the horizontal tracking, but the fact that the patient is asked to focus on something immediate (the therapist’s hand) while at the same time accessing their memories.<sup>43</sup> While the research on eye movements has centered on its use in EMDR, the ART protocol is derived directly from EMDR, and so it is reasonable to assume that the same processing mechanisms are occurring in ART as in EMDR.

**Step 3 (Memory Reconsolidation Through Imagery Rescripting)**

After the desensitization phase, the patient uses imagery rescripting<sup>43</sup> to imagine a new, preferred way to visualize their original traumatic experience, similar to the way in which the director of a movie may change the ending scene. This rescripting is facilitated by sets of horizontal eye movements. The purpose of this step is to modify the memory of the traumatic experience through the process of memory reconsolidation.<sup>44,45</sup> In brief, emotionally laden memories (e.g., those associated with trauma) become labile during a relatively short window of time each time they are retrieved (recalled) at a level that produces physiological arousal and undergo molecular processing (e.g., protein synthesis) when reconsolidated following retrieval.<sup>46-48</sup> This results in new information being woven into the original memory,<sup>49</sup> including the potential for the old (original) information to be weakened or lost.<sup>50</sup> Importantly, this modification of the original memory may help to offset cognitive distortions resulting from the original trauma, which give rise to the classic manifestations of PTSD, including emotional numbing, hypervigilance, fear, and avoidance behaviors.<sup>51</sup> The use of horizontal eye movements during this step may be enhancing memory reconsolidation through multiple mechanisms, including increased interhemispheric communication<sup>52</sup> and disruption of the original memory trace.<sup>53</sup>

**Step 4 (Assessment and Closeout)**

Following completion of the key steps above, the ART practitioner uses several additional reinforcing techniques to test whether or not there are remaining “stuck” points/images that

generate visceral responses and to evaluate the ease with which the patient can shift their focus to the rescripted image. Several tools may be used to further modify the original imagery, for example, having the patient visualize the therapist’s hand as an eraser erasing the “stuck” image, imagining someone painting over the old images, turning the images into a cartoon, and so on. The goal is to have the patient report that they can access the original memory without significant distress and can easily shift to the rescripted version. A closing ritual of crossing a bridge, going down a path, passing under an archway, and so on helps to reinforce that the trauma is now in the past.

**SYNOPSIS OF EMPIRICAL RESEARCH BASE**

To date, there have been four studies conducted on ART for the treatment of psychological trauma. All resulted in peer-reviewed publications, including multiple case series and one randomized clinical trial. Selected characteristics of these studies are presented in Table I and include all subjects who completed at least one session of ART. The first study, conducted principally among adult civilians, used an observational prospective cohort study design (*n* = 75) with clinical assessments made pre-ART, post-treatment completion, and at 2- and 4-month follow-up.<sup>54</sup> The second study was a randomized controlled trial among 57 U.S. service members and veterans, with clinical assessments made pre-ART, post-treatment completion, and at 3-month follow-up.<sup>55</sup> In this trial, ART was compared with an attention control condition that consisted of two sessions of fitness or career counseling. For this commentary, all results are presented as before and after receipt of ART, including some attention control group subjects who were offered and agreed to try ART after completion of the control condition. The third study, a large case series among U.S. service members and veterans, used an observational prospective cohort study design (*n* = 160) with clinical assessments made pre-ART, post-treatment completion, and at 6-month follow-up.<sup>56</sup> The fourth study, conducted among female veterans with a history of military sexual trauma, used a pilot observational cohort study design (*n* = 6)

**TABLE I.** Characteristics of Empirical Studies of ART Among Subjects Who Received At Least One Session of ART.

Study	<i>N</i>	Design	Study Population	ART Sessions (Mean, std. dev.)	Comments
1 <sup>54</sup>	75	Cohort	Adults ages 21–60 (mean = 40.3) yr; 80.0% female, principally civilians	3.5 (1.3) Range: 1–5	Primary trauma for which treatment sought was violent or abusive crime (51%). 80% of subjects had lived with traumatic memory(ies) for ≥7 yr.
2 <sup>55</sup>	50	RCT	U.S. service members/veterans ages 24–68 (mean = 41.9) yr; 82.0% male	3.7 (1.1) Range: 2–5	Approximately half of subjects reported having ≥ 5 traumatic memories and living with them for >10 yr. Nearly 70% had previously received therapy for PTSD (e.g., CPT/PE).
3 <sup>56</sup>	160	Cohort	U.S. service members/veterans ages 23–82 (mean = 43.6) yr; 94.4% male	3.5 (1.4) Range: 1–5	U.S. service members or veterans with prior deployment(s) to major conflict zones(s) and/or military sexual trauma. 54% screened positive for mild traumatic brain injury.
4 <sup>57</sup>	6	Cohort	U.S. veterans ages 22–49 (mean = 37.7) yr; 100% female	4.2 (1.0) Range: 3–5	All subjects had experienced uninvited or unwanted sexual attention. Majority stated that someone had used force or threat of force to have sexual contact with them.

RCT, randomized controlled trial.

with clinical assessments made pre-ART, post-treatment completion, and at 3-month follow-up.<sup>57</sup>

All four studies used the 17-item PCL-C or PCL-M instrument (PTSD Checklist – Civilian or Military version) to assess change in symptoms of PTSD from pre- to post-ART completion. In addition, for all four studies (assessed individually and overall), standardized effect sizes and 95% confidence intervals were calculated using the within-person single-group pretest–posttest design described by Morris and DeShon.<sup>58</sup> For all enrolled subjects in the four studies combined ( $n = 291$ ), the mean age was  $42.3 \pm 12.3$  yr, 28.9% of subjects were female, and the mean number of ART sessions received was  $3.5 \pm 1.3$ . Among the 237 treatment completers (81.4% of the combined cohort), the mean age was  $42.0 \pm 12.0$  yr, 32.1% of subjects were female, and the mean number of ART sessions received was  $3.9 \pm 1.1$ .

### Change in PTSD Scores (Table II)

Across the four studies among treatment completers, the mean PCL score before treatment ranged from  $54.0 \pm 12.4$  to  $59.5 \pm 13.2$ . After treatment with ART, mean PCL scores across studies ranged from  $30.7 \pm 11.2$  to  $40.7 \pm 17.8$ . This equates to mean treatment-related reductions in PCL scores from  $15.6 \pm 13.2$  to  $25.6 \pm 11.3$  across the four studies. In the overall analysis (all studies combined) of the 237 treatment completers, the mean reduction on the PCL was  $20.6 \pm 15.0$ . Effect sizes among treatment completers across studies were large, ranging from 1.18 to 2.26 ( $p < 0.0005$ ), with an overall effect size of 1.38 (95% confidence interval: 1.20–1.56,  $p < 0.0001$ ). Results were attenuated to a small degree in the ITT analysis, which conservatively assumed no treatment response for non-completers. In this analysis, effect sizes were still large, ranging from 0.92 to 2.26 across the four studies. The overall effect size was 1.07 (95% confidence interval: 0.93–1.21,  $p < 0.0001$ ).

### Clinically Significant Change in PTSD

Using the clinical cutpoint of  $\geq 10$ -point reduction on the PCL instrument,<sup>59</sup> clinically significant change (response) among the 237 treatment completers ranged from 63.8% to 100.0% across the four studies. In the ITT analysis ( $n = 291$ ) that conservatively assumed no treatment effect for non-completers, clinically significant change ranged from 53.8% to 100.0% across the four studies. In the overall analysis of the 237 treatment completers, 74.7% experienced a clinically significant reduction on the PCL instrument (95% confidence interval: 68.6% to 80.1%,  $p < 0.0001$ ). In the ITT analysis, this was attenuated to a treatment response rate of 60.8% (95% confidence interval: 55.0% to 66.5%,  $p = 0.0001$ ). These rates of treatment response appear to relate favorably to those reported among clinical trials of CPT and PE. Among such trials, 49% to 70% of participants attained clinically meaningful improvement in PTSD symptoms (defined as a 10- to 12-point decrease in interviewer-assessed or self-reported symptoms).<sup>21</sup>

### Limitations of the Research to Date

Although the above research is highly promising, leading to ART receiving the designation of “evidence-based” from SAMHSA,<sup>60</sup> there are limitations in the methodology and extent of available empirical data that have limited the recognition of ART in clinical practice guidelines. Importantly, primary PTSD outcomes in studies to date have relied solely on self-report measures (e.g., PCL) not obtained by independent evaluators blind to the study condition. Furthermore, in the one ART randomized clinical trial, the two-session attention control condition did not directly match the amount of therapist contact time for participants who initially received ART. Lastly, all of the research to date has been conducted by a single investigative team including persons associated with the developer, although she did not perform any interventions of this proprietary treatment approach. Notwithstanding these limitations, the ART research to date has set the stage well for more definitive research. A study is now underway at the Cincinnati VA by an entirely independent group that will compare ART with CPT in a head-to-head trial using state-of-the-art methodology, including clinician assessments by blinded independent evaluators. In addition to directly comparing clinical outcomes, the study will empirically assess whether efficacy is truly greater in a fewer number of sessions for ART compared with CPT.

### COMPARISON OF ART TO VA/DOD GUIDELINES

The current VA/DoD Clinical Practice Guideline, published in June 2017,<sup>14</sup> does not make specific reference to ART as a potential treatment modality for PTSD. Therefore, it is instructive to carefully review the language in the guideline to assess whether ART may be considered and justified by providers as a potential first-line trauma-focused psychotherapy.

First and foremost is “*Recommendation #11*” which states: “we recommend individual, manualized trauma-focused psychotherapies that have a primary component of exposure and/or cognitive restructuring to include Prolonged Exposure (PE), Cognitive Processing Therapy (CPT), Eye Movement Desensitization and Reprocessing (EMDR), specific cognitive behavioral therapies for PTSD, Brief Eclectic Psychotherapy (BEP), Narrative Exposure Therapy (NET), and written narrative exposure.”<sup>14</sup> There are multiple components to this recommendation that are relevant to ART, as reviewed below:

- Individualized: ART is provided individually, and not as couples or group therapy.
- Manualized: ART is manualized and contains an explicitly defined treatment protocol with specific steps to be implemented in each treatment session. This protocol is defined in the ART training manual and in an abbreviated clinician script that can be referred to by the clinician during sessions. ART is manualized in a manner similar to EMDR. Rather than a course of treatment being defined by a specific number of sessions (as in PE and CPT), ART involves a set of procedures that can be applied as indicated for as



**TABLE II.** Treatment Response with ART Among Subjects Who Received At Least One Session of ART.

Study	Measure	N	Pre-ART	Post-ART	Difference	Effect Size	95% CI	p-Value <sup>c</sup>
1 <sup>54</sup>	PCL-C (completers)	66	54.0 (12.4)	30.7 (11.2)	23.3 (13.1)	1.78	1.37–2.19	<0.0001
	PCL-C (ITT <sup>a</sup> )	75	54.1 (12.7)	33.6 (14.1)	20.5 (14.5)	1.42	1.09–1.75	0.0006
2 <sup>55</sup>	PCL-M (completers)	47	56.3 (14.3)	40.7 (17.8)	15.6 (13.2)	1.18	0.85–1.52	0.0005
	PCL-M (ITT <sup>a</sup> )	50	57.3 (14.5)	42.6 (19.0)	14.7 (13.3)	1.00	0.71–1.29	0.0007
3 <sup>56</sup>	PCL-M (completers)	118	59.5 (13.2)	38.6 (16.4)	20.9 (16.3)	1.28	1.02–1.53	<0.0001
	PCL-M (ITT <sup>a</sup> )	160	59.0 (13.8)	43.6 (18.1)	15.4 (16.8)	0.92	0.73–1.11	<0.0001
4 <sup>57</sup>	PCL-M (completers)	6	57.2 (14.7)	31.7 (15.2)	25.5 (11.3)	2.26	0.73–3.78	0.15
	PCL-M (ITT <sup>a</sup> )	6	57.2 (14.7)	31.7 (15.2)	25.5 (11.3)	2.26	0.73–3.78	0.15
Pooled	PCL-C/M (completers)	237	57.3 (13.4)	36.6 (15.8)	20.6 (15.0)	1.38	1.20–1.56	<0.0001
	PCL-C/M (ITT <sup>a</sup> )	291	57.4 (13.7)	40.6 (17.8)	16.8 (15.7)	1.07	0.93–1.21	<0.0001
<b>Clinically significant change (improvement)<sup>b</sup></b>			<b>Reduction of ≥ 10 Points on PCL;</b>			<b>Exact 95% CI</b>		<b>p-Value<sup>d</sup></b>
			<b>N (%)</b>					
1 <sup>54</sup>	PCL-C (completers)	66	55 (83.3)			72.1–91.4		<0.0001
	PCL-C (ITT <sup>a</sup> )	75	55 (73.3)			61.9–82.9		<0.0001
2 <sup>55</sup>	PCL-M (completers)	47	30 (63.8)			48.5–77.3		0.03
	PCL-M (ITT <sup>a</sup> )	50	30 (60.0)			45.2–73.6		0.08
3 <sup>56</sup>	PCL-M (completers)	118	86 (72.9)			63.9–80.7		<0.0001
	PCL-M (ITT <sup>a</sup> )	160	85 (53.8)			45.7–61.7		0.17
4 <sup>57</sup>	PCL-M (completers)	6	6 (100.0)			54.1–100.0		0.007
	PCL-M (ITT <sup>a</sup> )	6	6 (100.0)			54.1–100.0		0.007
Pooled	PCL-C/M (completers)	237	177 (74.7)			68.6–80.1		<0.0001
	PCL-C/M (ITT <sup>a</sup> )	291	177 (60.8)			55.0–66.5		0.0001

<sup>a</sup>Intention to treat analysis: conservatively assumes no treatment effect (difference value of 0) for subjects who did not complete treatment.

<sup>b</sup>Defined as reduction of ≥10 points on the PCL-M or PCL-C<sup>59</sup>.

<sup>c</sup>Based on z-score derived from effect size calculation.

<sup>d</sup>One-sided test of alternative hypothesis that response rate exceeds 50%.

many treatment sessions as necessary to complete a treatment course. ART is “scene” or “theme” specific and typically addresses one major trauma or problem in each single-treatment session. In published studies of ART, the mean number of treatment sessions is approximately four, although the number of sessions is not set with ART.

- c. Trauma-focused psychotherapy: The guideline defines “trauma-focused psychotherapy” as any therapy that uses cognitive, emotional, or behavioral techniques to facilitate processing a traumatic experience and in which the trauma focus is a central component of the therapeutic process.<sup>61</sup> The ART protocol is fully consistent with this definition. Specifically, each trauma to be processed is put into a “scene” and is the central component of the therapeutic process. Specific techniques used with ART, consistent with the guideline, include desensitization through imaginal exposure, *in vitro* exposure, cognitive restructuring, relaxation, and Gestalt techniques. Similarly, the ART protocol is consistent with the European-based NICE Guideline that recommends PTSD sufferers be offered a course of trauma-focused psychological treatment that is normally provided on an individual outpatient basis.<sup>12</sup> Although the NICE guidelines recommend a minimum of 8–12 sessions when the PTSD results from a single event and potentially longer for more complex trauma, the mean duration of treatment in published studies of ART has been approximately four treatment sessions.
- d. Endorsed therapies: The guideline lists EMDR as a first-line recommended individual trauma-focused psychotherapy.

ART was developed in 2008 by Laney Rosenzweig after she was trained in EMDR. All of the core techniques used in ART are found in EMDR protocols, but they are organized in a more streamlined, body-centric manner. For example, the shifting of a patient’s attention from the trauma to body sensations is a core technique used in EMDR. However, in EMDR, it is generally only conducted after more open-ended desensitization and cognitive processing techniques have been applied, whereas in ART, it is conducted in a routine, systematized manner from the very beginning of the session. Similarly, the rescripting of a trauma memory, which is a core component of the ART protocol, is a technique also used in EMDR. However, in EMDR, rescripting is typically only used for situations in which a patient is not responding well to the basic EMDR protocol. Both EMDR and ART use guided visualizations and eye movements to facilitate desensitization and processing of distressing memories, *in vitro* (visualized) exposure to future feared triggers, practicing preferred behavior through visualizations, and eliciting improvements in physiological arousal, emotional reactivity, and core negative beliefs through eye movements. Processing can be accomplished with minimal narration of the trauma details in both EMDR and ART. One difference is that ART standardizes the eye movement sets, including an emphasis on fast speed, whereas in EMDR, clinicians are taught to alter the number, speed, and direction of sets based on a number of factors. With respect to the standardization of eye movements, some

**TABLE III.** Key Components and Differentiation Between EMDR and ART Protocols for Treatment of PTSD.<sup>27, 28, 62</sup>

EMDR	ART
<p>Target for Processing: Single worst image from the trauma and associated negative cognition and emotions are typically selected as the target for processing, although some protocols involve visualizing the entire event.</p> <p>Desensitization: Free-associative desensitization process is used to identify and process associations with the trauma target. For example, a typical EMDR processing script might use this sequence: “Bring up the worst image, those negative words, and notice where you’re feeling that in your body. Follow my finger. [process with eye movements]. Take a breath. Let it go. What are you noticing now? (or What comes up?) Go with that (notice that) and follow my finger [process with eye movements]. Take a breath. Let it go. What are you noticing now?”</p> <p>Cognitive Focus: Although patients receiving EMDR are often asked where they feel the target trauma in their body and to attend to body sensations, total body scanning is less of an emphasis than the cognitive focus, where patients are asked to identify a negative cognition associated with the trauma target and a desired positive cognition, with the specific goal of installing the positive cognition at a high level of validity by the end of the session.</p> <p>Resolution: “Installation” of preferred positive cognition is a key goal of the therapeutic process, along with reduction in overall distress. These changes are expected to emerge spontaneously through the free-associative process of noticing what comes up when the target is activated. However, other techniques, including Socratic-style questions, distancing techniques, or altering/rescripting a trauma memory may also be utilized, as indicated.</p> <p>Eye Movements: Clinicians are expected to vary the speed, number, and sometimes the direction of eye movements or use other forms of bilateral stimulation, according to client responses and other factors. For example, slow short sets for positive resourcing and faster longer sets for trauma processing.</p>	<p>Target for Processing: Patient is routinely asked to visualize the entire traumatic event from beginning to end.</p> <p>Desensitization: Desensitization process keeps attention focused on the body. For example, “Start the scene and follow my hand [process with eye movements]. Take a deep breath. Forget the scene (or put the scene aside.) Check your body from head to toe. What sensations do you have right now? Notice that and follow my hand [process with eye movements]. Take a deep breath... Has anything moved or changed?”</p> <p>Body Focus: Alternates between visual imagery and bringing attention on somatic/emotional sensations that are closely paired with the traumatic material. Continuous body scanning is used throughout the session.</p> <p>Resolution: Rescripting is a core procedure used in ART. After initial desensitization, patients actively re-script targeted traumatic event or change their experience or relationship to the event in the way they find most suitable. Cognitive reframing emerges naturally in association with these changes. Similar to EMDR, a primary goal is resolution of the distressing negative body sensations and emotions associated with the target. Postulates that traumatic memories can be modified through memory reconsolidation.</p> <p>Eye Movements: Sets are fixed in horizontal direction and number (40), with minor adjustments for comfort (e.g., height, closeness to patient). The same speed (equivalent to a fast EMDR pace) is used for both positive visualizations and trauma processing.</p>

research indicates that performing horizontal eye movements at a fast speed (i.e., as in ART) yields better outcomes.<sup>36</sup> However, by contrast, a recent clinical trial comparing a single point of focus versus horizontal eye movements suggests that modification of eye movement sets might not have particular bearing on outcome, so long as there is some sort of dual focus procedure being followed.<sup>43</sup> The two therapies are more directly compared in Table III. To summarize, ART is a direct derivative of and aligns closely with EMDR, and thus the evidence that supports the guideline recommendation of EMDR as a first-line treatment modality for PTSD, likely also applies to ART.

- e. Other considerations: The VA/DoD Clinical Practice Guideline also provides language to allow for clinician discretion in selecting an optimal therapeutic approach to meet the specific needs of individual patients based on a number of factors, including patient preference. This discretion appears to provide an opportunity for clinicians to consider how best to apply core components of trauma-focused therapy in a way that will be most suitable for their patients. Regarding patient preferences, the potential brevity of the ART protocol is likely one feature that may interest many patients, as is the fact that the trauma processing does not require the patient to narrate their trauma verbally or in

writing. This can be relevant to service members and veterans with exposure to classified operations and those who do not wish to share details of highly emotional experiences involving shame or guilt, such as those involving combat losses and sexual trauma.

**CONCLUSIONS**

The ART protocol, which is manualized and delivered as an individual trauma-focused therapy, contains the core therapeutic elements of recommended trauma-focused psychotherapies for PTSD and aligns closely with current PTSD treatment guidelines, including the VA/DoD Clinical Practice Guideline and the European-based NICE Guideline.<sup>12-14</sup> Essentially, all of the specific techniques used in ART are found somewhere in EMDR protocols, although the ART protocol clearly provides a more streamlined, body-focused approach with an emphasis on rescripting, which likely enhances benefits through memory reconsolidation. There is also an evolving, yet presently limited, empirical research base for ART that includes four published studies, one of which was a randomized controlled trial and that resulted in ART being formally recognized at the federal level (by SAMHSA) as an effective evidence-based modality for the treatment of trauma- and stress-related

disorders and symptoms, as well as for depressive symptoms and self-concept.<sup>60</sup>

There are several features of ART that both behavioral health clinicians and service members and veterans may perceive as particularly appealing and beneficial in the treatment of PTSD. First is the brevity of the protocol, which has indicated efficacy in an average of only three to four treatment sessions in the studies completed to date. Second is the protocol format, whereby the service member/veteran does not need to share specific details of their traumatic experience(s), whether verbally or in writing. Finally, a recent review of ART suggested that the technique also contributes to high provider satisfaction rates due to its therapeutic effectiveness and ability to reduce compassion fatigue.<sup>28</sup>

Given the current and anticipated long-term need for effective PTSD treatments for service members and veterans from all deployments and past conflicts, behavioral health care providers must be equipped and have the flexibility to use a range of effective trauma-focused modalities in VA and DoD treatment centers in accordance with patient preferences. ART appears to possess the requisite clinical, empirical, and theoretical rationale for selection as a first-line PTSD treatment modality for military personnel and veterans.

### CONFLICT OF INTEREST

Dr Kip and Dr Diamond do not have any financial interests in ART.

### REFERENCES

1. American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, ed 5, Washington, DC, American Psychiatric Publishing Inc, 2013.
2. Kok BC, Herrell RK, Thomas JL, Hoge CW: Posttraumatic stress disorder associated with combat service in Iraq or Afghanistan: reconciling prevalence differences between studies. *J Nerv Ment Dis* 2012; 200: 444–50.
3. Ramchard R, Schell TL, Kamey BR, Osilla KC, Burns RM, Caldarone LB: Disparate prevalence estimates of PTSD among service members who served in Iraq and Afghanistan: possible explanations. *J Trauma Stress* 2010; 23: 59–68.
4. Richardson LK, Frueh BC, Acierno R: Prevalence estimates of combat-related PTSD: a critical review. *Aust N Z J Psychiatry* 2010; 44: 4–19.
5. Kang HK, Natelson BH, Mahan CM, Lee KY, Murphy FM: Post-traumatic stress disorder and chronic fatigue syndrome-like illness among Gulf War veterans: a population-based survey of 30,000 veterans. *Am J Epidemiol* 2003; 157: 141–8.
6. Marmar CR, Schlenger W, Henn-Haase C, et al: Course of posttraumatic stress disorder 40 years after the Vietnam War: findings from the National Vietnam Veterans Longitudinal Study. *JAMA. Psychiatry* 2015; 72: 875–81.
7. Wisco BE, Marx BP, Wolf EJ, Miller MW, Southwick SM, Pietrzak RH: Posttraumatic stress disorder in the US veteran population: results from the National Health and Resilience in Veterans Study. *J Clin Psychiatry* 2014; 75: 1338–46.
8. Buckley TC, Mozley SL, Bedard MA, Dewulf AC, Greif J: Preventive health behaviors, health-risk behaviors, physical morbidity, and health-related role functioning impairment in veterans with post-traumatic stress disorder. *Mil Med* 2004; 169: 536–40.
9. Pietrzak RH, Goldstein RB, Southwick SM, Grant BF: Prevalence and axis I comorbidity of full and partial posttraumatic stress disorder in the United States: results from wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions. *J Anxiety Disord* 2011; 25: 456–65.
10. Schnurr PP, Lunney CA, Bovin MJ, Marx BP: Posttraumatic stress disorder and quality of life: extension of findings to veterans of the wars in Iraq and Afghanistan. *Clin Psychol Rev* 2009; 29: 727–35.
11. Levine AB, Levine LM, Levine TB: Posttraumatic stress disorder and cardiometabolic disease. *Cardiology* 2014; 127: 1–19.
12. National Institute for Health and Clinical Excellence: Post-traumatic Stress Disorder: the Treatment of PTSD in Adults and Children. London, NICE Clinical Guidelines, 2005.
13. National Institute for Health and Clinical Excellence: Evidence Update 49 – Post-traumatic Stress Disorder (PTSD). Manchester, UK, 2013.
14. VA/DoD Clinical Practice Guideline for the Management of Post-Traumatic Stress and Acute Stress Disorder. 2017. (Accessed October 2, 2017, at <https://www.healthquality.va.gov/guidelines/MH/ptsd/VADoDPTSDCPGFinal082917.pdf>.)
15. Karlin BE, Cross G: From the laboratory to the therapy room: national dissemination and implementation of evidence-based psychotherapies in the U.S. Department of Veterans Affairs Health Care System. *Am Psychol* 2014; 69: 19–33.
16. Ruzek JI, Karlin BE, Zeiss A: Implementation of evidence-based psychological treatments in the Veterans Health Administration. In: Dissemination and Implementation of Evidence-Based Psychological Interventions, pp 78–96. Edited by McHugh RK, Barlow DH New York, NY, Oxford University Press, 2012.
17. Boudewyns PA, Hyer LA: Eye movement desensitization and reprocessing (EMDR) as treatment for post-traumatic stress disorder (PTSD). *Clin Psychol Psychother* 1996; 3: 185–95.
18. Resick PA, Wachen JS, Mintz J, et al: A randomized clinical trial of group cognitive processing therapy compared with group present-centered therapy for PTSD among active duty military personnel. *J Consult Clin Psychol* 2015; 83: 1058–68.
19. Schnurr PP, Friedman MJ, Engel CC, et al: Cognitive behavioral therapy for posttraumatic stress disorder in women: a randomized controlled trial. *JAMA* 2007; 297: 820–30.
20. Suris A, Link-Malcolm J, Chard K, Ahn C, North CS: A randomized clinical trial of cognitive processing therapy for veterans with PTSD related to military sexual trauma. *J Trauma Stress* 2013; 26: 28–37.
21. Steenkamp MM, Litz BT, Hoge CW, Marmar CR: Psychotherapy for military-related PTSD: a review of randomized clinical trials. *JAMA* 2015; 314: 489–500.
22. Eftekhari A, Ruzek JI, Crowley JJ, Rosen CS, Greenbaum MA, Karlin BE: Effectiveness of national implementation of prolonged exposure therapy in veterans affairs care. *JAMA Psychiatry* 2013; 70: 949–55.
23. Kehle-Forbes SM, Meis LA, Spooner MR, Polusny M: Treatment initiation and dropout from prolonged exposure and cognitive processing therapy in a VA outpatient clinic. *Psychological. Trauma* 2016; 8: 107–14.
24. Steenkamp MM, Litz BT: Psychotherapy for military-related posttraumatic stress disorder: review of the evidence. *Clin Psychol Rev* 2013; 33: 45–53.
25. Gutner CA, Gallagher MW, Baker AS, Sloan DM, Resick PA: Time course of treatment dropout in cognitive behavioral therapies for post-traumatic stress disorder. *Psychol Trauma* 2016; 8: 115–21.
26. Hernandez DF, Waits W, Calvio L, Byrne M: Practice comparisons between accelerated resolution therapy, eye movement desensitization and reprocessing and cognitive processing therapy with case examples. *Nurse Educ Today* 2016; 47: 74–80.
27. Kip KE, Shuman A, Hernandez DF, Diamond DM, Rosenzweig L: Case report and theoretical description of accelerated resolution therapy (ART) for military-related post-traumatic stress disorder. *Mil Med* 2014; 179: 31–7.
28. Waits W, Marumoto M, Weaver J: Accelerated resolution therapy (ART): a review and research to date. *Curr Psychiatry Rep* 2017; 19: 18.
29. Purves D, Augustine GJ, Fitzpatrick D: Neuroscience, 2 ed, Sunderland, MA, Sinauer Associates, 2001.

30. Stickgold R: EMDR: a putative neurobiological mechanism of action. *Journal of Clin Psychol* 2002; 58: 61–75.
31. Barrowcliff AL, Gray NS, Freeman TCA, MacCulloch MJ: Eye movements reduce the vividness, emotional valence and electrodermal arousal associated with negative autobiographical memories. *J Forens Psychiatry Psychol* 2004; 15: 325–45.
32. Barrowcliff AL, Gray NS, MacCulloch S, Freeman TCA, MacCulloch MJ: Horizontal rhythmical eye movements consistently diminish the arousal provoked by auditory stimuli. *Br J Clin Psychol* 2003; 42: 289–302.
33. Elofsson UO, von Scheele B, Theorell T, Sondergaard HP: Physiological correlates of eye movement desensitization and reprocessing. *J Anxiety Disord* 2008; 622–34.
34. Bruyné TT, Mahoney CR, Augustyn JS, Taylor HA: Horizontal saccadic eye movements enhance the retrieval of landmark shape and location information. *Brain Cogn* 2009; 70: 279–88.
35. Christman SD, Garvey KJ, Proper RE, Phaneuf KA: Bilateral eye movements enhance the retrieval of episodic memories. *Neuropsychology* 2003; 17: 221–9.
36. Maxfield L, Melnyk WT, Hayman CAG: A working memory explanation for the effects of eye movements in EMDR. *J EMDR Pract Res* 2008; 2: 247–61.
37. Nieuwenhuis S, Elzinga BM, Ras PH, et al: Bilateral saccadic eye movements and tactile stimulation, but not auditory stimulation, enhance memory retrieval. *Brain Cogn* 2013; 81: 52–6.
38. Parker A, Buckley S, Dagnall N: Reduced misinformation effects following saccadic bilateral eye movements. *Brain Cogn* 2009; 69: 89–97.
39. Parker A, Relph S, Dagnall N: Effects of bilateral eye movements on the retrieval of item, associative and contextual information. *Neuropsychology* 2008; 22: 136–45.
40. Gunter RW, Bodner GE: How eye movements affect unpleasant memories: support for a working-memory account. *Behav Res Ther* 2008; 46: 913–31.
41. van Schie K, van Veen SC, Engelhard IM, Klugkist I, van den Hout MA: Blurring emotional memories using eye movements: individual differences and speed of eye movements. *Eur J Psychotraumatol* 2016; 7: 29476.
42. van den Hout M, Muris P, Salemink E, Kindt M: Autobiographical memories become less vivid and emotional after eye movements. *Br J Clin Psychol* 2001; 40: 121–30.
43. Sack M, Zehl S, Otti A, et al: A comparison of dual attention, eye movements, and exposure only during eye movement desensitization and reprocessing for posttraumatic stress disorder: Results from a randomized clinical trial. *Psychother Psychosom* 2016; 85: 357–65.
44. Nader K, Schafe GE, LeDoux JE: Fear memories require protein synthesis in the amygdala for reconsolidation after retrieval. *Nature* 2000; 406: 722–6.
45. Nader K, Hardt O: Single standard for memory: the case for reconsolidation. *Nat Rev Neurosci* 2009; 20: 224–34.
46. Monfils MH, Cowansage KK, Klann E, LeDoux JE: Extinction-reconsolidation boundaries: key to persistent attenuation of fear memories. *Science* 2009; 324: 951–5.
47. Schiller D, Monfils MH, Raio CM, Johnson DC, Ledoux JE, Phelps EA: Preventing the return of fear in humans using reconsolidation update mechanisms. *Nature* 2010; 463: 49–53.
48. Tronson NC, Taylor JR: Molecular mechanisms of memory reconsolidation. *Nat Rev Neurosci* 2007; 8: 262–75.
49. Hardt O, Einarsson EO, Nader K: A bridge over troubled water: reconsolidation as a link between cognitive and neuroscientific memory research traditions. *Annu Rev Psychol* 2010; 61: 141–67.
50. Treanor M, Brown LA, Rissman J, Craske MG: Can memories of traumatic experiences or addiction be erased or modified? A critical review of research on the disruption of memory reconsolidation and its applications. *Perspect Psychol Sci* 2017; 12: 290–305.
51. Liberzon I, Sripada CS: The functional neuroanatomy of PTSD: a critical review. *Prog Brain Res* 2008; 167: 151–69.
52. Dumermuth G, Lehman D: REM-like state enhances memory reconsolidation. *Eur Neurology* 1981; 22: 322–39.
53. Van den Hout MA, Engelhard IM: How does EMDR work? *J Exp Psychopathol* 2012; 5: 724–38.
54. Kip KE, Elk CA, Sullivan KL, et al: Brief treatment of symptoms of post-traumatic stress disorder (PTSD) by use of accelerated resolution therapy (ART). *Behav Sci* 2012; 2: 115–34.
55. Kip KE, Rosenzweig L, Hernandez DF, et al: Randomized controlled trial of accelerated resolution therapy (ART) for symptoms of combat-related post-traumatic stress disorder (PTSD). *Mil Med* 2013; 178: 1298–309.
56. Kip KE, D’Aoust RF, Hernandez DF, et al: Evaluation of brief treatment of symptoms of psychological trauma among veterans residing in a homeless shelter by use of accelerated resolution therapy (ART). *Nurs Outlook* 2016; 64: 411–23.
57. Rossiter AG, D’Aoust RF, Shafer MR, Martin M, Kip KE: Accelerated resolution therapy for women veterans experiencing military sexual trauma related post-traumatic stress disorder. *Ann Psychiatry Ment Health* 2017; 5: 1108.
58. Morris SB, DeShon RP: Combining effect size estimates in meta-analysis with repeated measures and independent-groups designs. *Psychol Methods* 2002; 7: 105–25.
59. Monson CM, Gradus JL, Young-Xu Y, Schnurr PP, Price JL, Schumm JA: Change in posttraumatic stress disorder symptoms: do clinicians and patients agree? *Psychol Assess* 2008; 20: 131–8.
60. Accelerated Resolution Therapy. National Registry of Evidence Based Programs and Practices (NREPP). (Accessed January 2, 2018, at <http://nrepp.samhsa.gov/ProgramProfile.aspx?id=7>.)
61. Schnurr PP: Focusing on trauma-focused psychotherapy for posttraumatic stress disorder. *Curr Opin Psychol* 2017; 14: 56–60.
62. Shapiro F: Eye movement desensitization and reprocessing (EMDR) therapy. In: *Basic Principles, Protocols, and Procedures*, Ed 2, New York, NY, The Guilford Press, 2001.